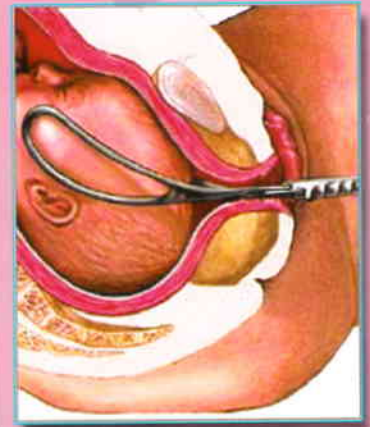
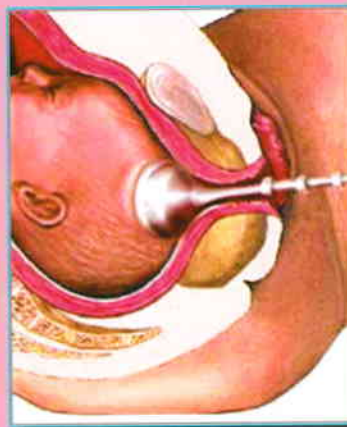


# OPERATIVE MISCELLANEOUS DIFFERENTIAL DIAGNOSIS PEARLS NAMES IN **OB/GYN**



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OPERATIVE  
GYNECOLOGY  
&  
OBSTETRICS

# Uterine stimulants – Ecbolics

## Oxytocin

### ▪ Source:

- It is formed in hypothalamic nuclei (nonapeptide☺)
- It is stored & released from the posterior pituitary.
- It is released also, by the fetus during labor☺

### ▪ Structure:

- **Natural:**
  - Posterior pituitary extract has two Fractions:-
    - ★ **Oxytocin** (pitocin).
    - ★ **ADH**
- **Synthetic:**
  - Syntocinon is a synthetic oxytocin
  - Syntometrine is a syntocinon + ergometrin.

### ▪ Actions:

#### 1. Labor:

- Contraction of pregnant uterus
- It lasts about 30 min
- The uterus is more sensitive to it as pregnancy advances (↑number of receptors is dependent on E)
- **Fergusson reflex** → pressure on cervix induces a neuro-endocrinal reflex → release of oxytocin.

#### 2. Lactation:

- Tactile stimulation of receptors in areola & nipple by suckling → neuroendocrinal reflex (release of oxytocin)
- This leads to contraction of myoepithelial cells → milk ejection (let-down) reflex

### ▪ Complication

Due to hyperstimulation	In high doses during labor
⇒ <b>Maternal:</b> <ul style="list-style-type: none"><li>- Uterine rupture</li><li>- Constriction ring</li><li>- AF embolism</li></ul>	⇒ <b>Water intoxication</b> hyponatremia + fits (ADH like effect)
⇒ <b>Fetal asphyxia</b>	⇒ <b>Neonatal jaundice</b> (displaces bilirubin from plasma proteins)



## ▪ **Indications**

Pregnancy	Labor
⇒ <b><u>Early:</u></b>	⇒ <b><u>1st &amp; 2<sup>nd</sup> stage:</u></b> treat inertia & augments labor
<ul style="list-style-type: none"> <li>- Abortion <ul style="list-style-type: none"> <li>○ Induction of abortion</li> <li>○ TTT of inevitable, missed, septic abortion &amp; post-abortion bleeding</li> </ul> </li> <li>- Vesicular mole</li> </ul>	⇒ <b><u>3rd stage:</u></b> <ul style="list-style-type: none"> <li>- Management of 3rd stage</li> <li>- Avoids &amp; treats PPH</li> <li>- Retained placenta</li> </ul>
⇒ <b><u>Late:</u></b>	
<ul style="list-style-type: none"> <li>- Contraction stress test</li> <li>- Ripening of Cx (PG is better)</li> <li>- Induction of labor (safer than PG)</li> </ul>	

## ▪ **Contraindications**

- **Absolute (when Vaginal delivery is contraindicated)**
  - Placenta previa
  - Transverse lie & CPD
  - Fetal distress
- **Relative (when there is risk of uterine rupture)**
  - Grand multipara
  - Breech
  - 1st degree CPD
  - Uterine scar

## ▪ **Administration**

- Ampoules: 1,5,10 IU
- Route:
  - **IV drip:**
    - ★ It is the most commonly used (in saline, dextrose, lactated ringer)
    - ★ start by small dose at a slow rate then gradually increase e.g 0.5-2 miu/min then increase by 1-2 miu/30-60 min
  - **Nasal spray**
  - **Cardiff infusion pump** :the best (accurate)
- Assess fetal wellbeing **مفاهمه جدا**
- It is given only after ROM to avoid amniotic fluid embolism

## Prostaglandins (PG)

### ▪ **Source** مهمه جدا:

- PGs are **unsaturated fatty acids** found in many tissues semen & endometrium.
- They are **20 carbon atom** formed by the action of the enzymes prostaglandin synthetase (cyclo-oxygenase) on the precursor, arachidonic acid.
- Arachidonic acid (non-esterified) is produced from phospholipids (esterified) by the action of phospholipase A2
- Each group of PG is given a **letter** (A, B, C, D, E, F, G, H or I) denotes particular functional groups in cyclopentanone ring.
- The **degree** of unsaturation of the side chains is indicated by the number that follows the letters, thus PGE1 (mesopristone), PGE2, PGE3 have one, two, three double bonds respectively.
- The **stereochemistry** at position 9 is denoted by the suffix  $\alpha$  or  $\beta$ . PGE2 & PGF2 $\alpha$  are strong oxytocics.
- They can be **given** IM, IV, vaginally, rectally, intramyometrial, intra and extra- amniotic.

### ▪ **Actions in obstetrics**

#### ❖ **Maternal:**

- ✓ On Cx: ripening (PGE2) >> initiation of parturition.
- ✓ On uterus: stimulate uterine contractions (PGF2 $\alpha$ )

❖ **Fetus** : important to keep ductus arteriosus patent & urine formation

### ▪ **Indication**

- Induction of abortion & labor, cervical ripening & PPH
- To keep the ductus arteriosus patent in some cardiac abnormalities

### ▪ **Complication**

- As oxytocin
- Nausea, vomiting, headache, fever
- Bronchospasm, hypertension

### ▪ **Contraindication**

- Drug allergy + as Oxytocin
- History of bronchial asthma, cardiovascular disease.

## ▪ **Administration**

- ❖ Dangerous drug (more potent than oxytocin).
- ❖ So more used in earlier pregnancy
- ❖ **Vaginal tablet:**
  - ⇒ PGE<sub>2</sub> (prostein, vagiprost, cervidil = dinoprostone) for cervical ripening
  - ⇒ PGE<sub>1</sub> (Cytotec, Mesotec = Mesopristone) 25µg/4hrs for 4 doses only
- ❖ **Intra-uterine extra amniotic** by Foley catheter (PGF2α=Enzaprost), for induction of abortion.
- ❖ **Intra-uterine intra- amniotic & Intramyometrial (Enzaprost)** = PGF2α in CS or PPH.

## **Ergot alkaloid**

## ▪ **Source**

- Derived from a fungus Claviceps (plant alkaloid)
- Methergine is semi-synthetic (methyl-ergometrin)

## ▪ **Action**

- it causes prolonged uterine spasm (lasts 3-4 hours)
- VC In high doses.

## ▪ **Indication (only after delivery of the fetus)**

- Inevitable or incomplete abortion
- Prevent (3<sup>rd</sup> stage) & treat PPH, postabortive bleeding
- Uterine sub-involution

## ▪ **Contraindication**

- Before fetal delivery → marked fetal distress up to asphyxia
- Cardiac diseases, Hypertension, PE → ↑ BP
- Ischemia of limbs.

## ▪ **Complication**

- Uterine rupture, Constriction ring, Retained placenta, Hypertension.
- Amniotic fluid embolism & fetal distress (if before delivery)

## ▪ **Administration**

- Oral 1 mg acts within 7min
- IM (0.25- 0.50 mg) acts within 3.5 min
- IV 0.25 mg acts within 1 min

# Termination of pregnancy

## A) Induction of abortion

A. **Therapeutic abortion:** Termination of pregnancy before the age of fetal viability to safeguard the maternal health.

### ▪ **Indications**

#### **Maternal**

#### - **General**

- ⇒ Severe diseases not responding to treatment
  - **DM:** with progressive renal or retinal affection, ↑ HbA1C
  - **Heart:** class III, IV, severe AS, pulmonary HTN, aortic coarctation cardiomyopathy, cyanotic heart disease, previous heart failure during pregnancy.
  - **Renal:** with impaired renal function
  - **Liver diseases**
  - **Hyperemesis:** with progressive organ damage
- ⇒ Malignancy: Breast cancer (or < 2 years from RM), melanoma, genital tract malignancy, chemotherapy or radiotherapy
- ⇒ Mental disorders

#### - **Local**

- ⇒ Acute PHA
- ⇒ Incarcerated RVF gravid uterus

#### **Fetal**

- ⇒ Blighted ovum, missed abortion, VM
- ⇒ CFMF or definite teratogens (STORCH-EB, irradiation)
- ⇒ Severe RH isoimmunization

B. **Elective abortion:** Interruption of pregnancy due to social factors (illegal).

### **Techniques of abortion**

	<b><u>Before 12 wks</u></b>	<b><u>After 12 wks</u></b>
<b><u>Medical</u></b>	Mefipristone, Epostone	Oxytocin, PG's
<b><u>Surgical</u></b>	<ul style="list-style-type: none"> <li>☞ D &amp; Evacuation</li> <li>☞ Suction evacuation</li> <li>☞ Menstrual extraction</li> <li>☞ Laminaria tents</li> </ul>	<ul style="list-style-type: none"> <li>☞ R.O.M</li> <li>☞ Intra-amniotic hypertonic fluids</li> <li>☞ Hysterectomy</li> <li>☞ hysterectomy en toto</li> </ul>



## **Surgical methods**

### **🔥 Technique of vaginal evacuation:**

- ⇒ Anesthesia (GEA or paracervical block), sterilization, catheterization
- ⇒ Lithotomy position, bimanual examination to exclude any abnormality
- ⇒ Insert Auvard's self retaining posterior vaginal wall speculum
- ⇒ Catch cervix with volsellum or ring forceps
- ⇒ Uterine sound to know length of uterus

### **⇒ Gradual dilatation of cervix**

- ✓ Insert ring forceps closed inside the uterus, then open to catch the products of conception then rotate 90° so that you are sure the uterine wall is not grasped
- ✓ Curettage by a sharp curette to remove
- ✓ Give ergometrin, avoid bleeding & perforation
- ✓ Examine the products & send them to histopathology +/- AntiD

### **Complications of vaginal evacuation :**

- Anesthesia complication
- hemorrhage may be due to {cervical lacerations, uterine perforation, retained products, uterine atony}
- Infection → Asherman \$
- Injury {incompetent cervix, uterine perforation, bladder or intestinal injury}

### **🔥 vacuum aspiration (Karman cannula)**

- introduce suction cannula inside the uterus to remove the products of conception, then sharp curettage may be done
- **Advantages:** less time, trauma & perforation, bleeding & anesthesia.

### **🔥 Menstrual aspiration:**

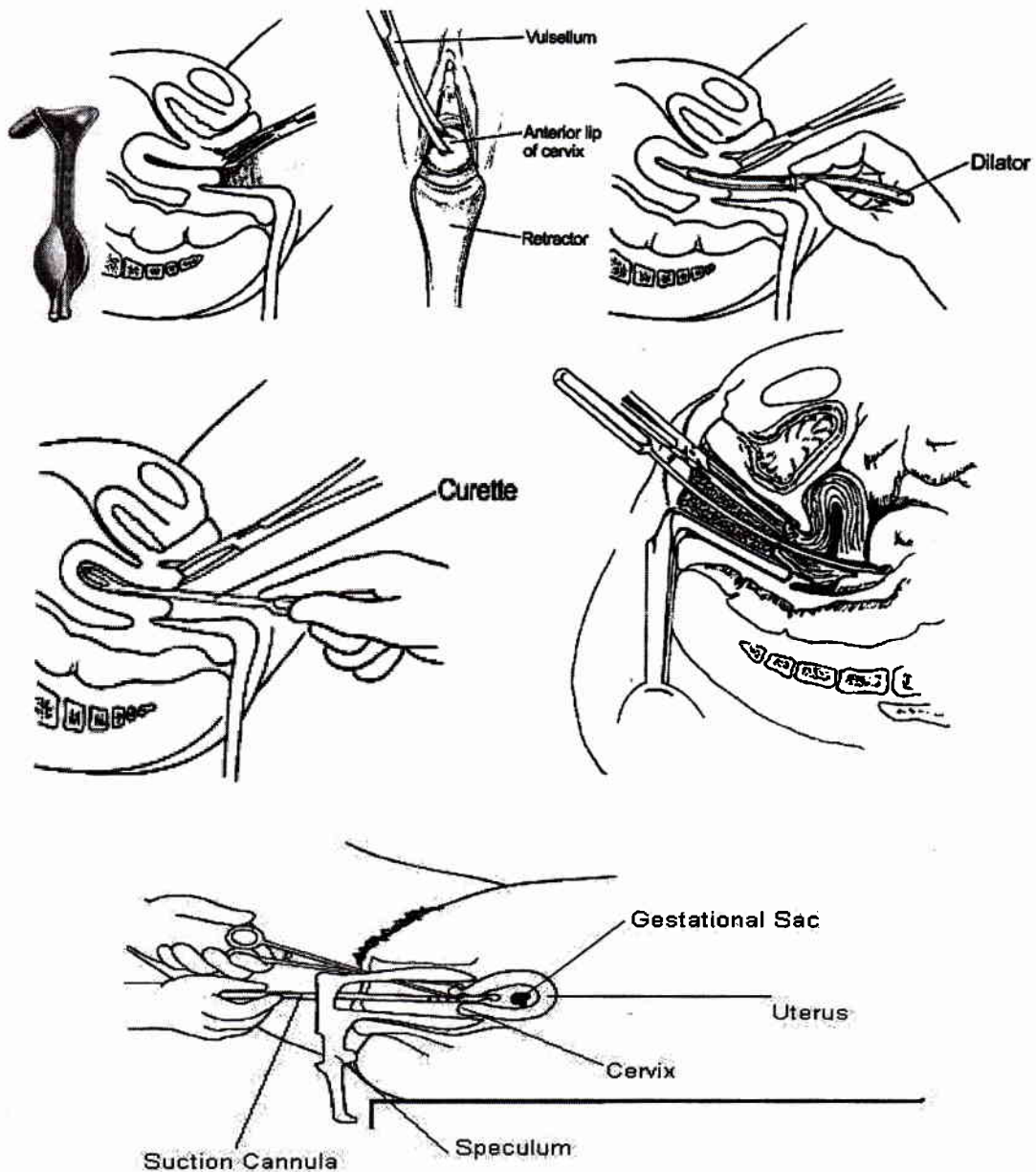
- The uterine cavity is aspirated using Karman cannula & a 50 ml syringe 1-3 weeks after a missed period.

### **🔥 Laminaria tents (Dilapan or Lamicel):**

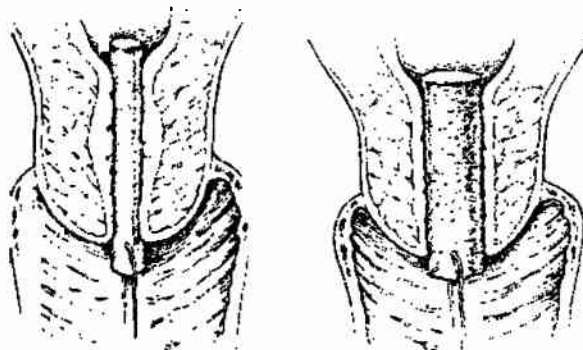
- They are weeds absorb water & slowly swell so dilate the Cx (left for 12-14 hrs followed by evacuation or induction of abortion.

### **🔥 Hysterotomy**

### **🔥 Hysterectomy en Toto**



### **Manual Vacuum Aspiration**



### **Laminaria tents**

# Medical methods

## ⇒ Oxytocin:

- 1 amp (10 IU) + 1000 ml of lactated ringer, Start infusion at 0.5 ml/ min (50 mu/min) the rate is ↑ every 20 – 30 min up to 200mu/min **مهمه جدا**

## ⇒ PG (E2, F2α):

- Intra-amniotic or extra amniotic or vaginal or oral routes
- Used before the oxytocin or before the curettage.

## ⇒ Intra-amniotic hypertonic fluids:

- 20% saline or 30% urea or glucose (50%).
- Not done because they may lead to
  - Hybernatermia
  - Hypervolemia, water intoxication & heart failure
  - Myometrial damage (due to extravasation)
  - DIC (thromboplastin from damaged tissues)
  - Infection (peritonitis & septic shock)

## ⇒ Anti progesterone.

- RU 486: it blocks progesterone receptors. Oral intake of 200- 600 mg followed 36 hours by oral or vaginal 400- 800 micrograms of misopristol.

In 1 <sup>st</sup> trimester	Success rate 99%
In 2 <sup>nd</sup> trimester	Success rate 80%

- Epystone it inhibits endogenous progesterone synthesis. Used in the first 4 weeks.

## ⇒ Various combinations of the above.

## ⇒ N.B. anti D Ig is given in aborting Rh -ve ♀ or 5 % of them will be sensitized.

## B) Induction of labor

### ❖ Definition:

- The process whereby labor is initiated by artificial means.
- Augmentation of labor is the artificial stimulation of labor that has begun spontaneously.

### ❖ Indication:

- When continuation of pregnancy is hazardous to mother or fetus
- **Maternal indications:**
  - ⇒ Pre-eclampsia or eclampsia, PROM near term, Chorioamnionitis
  - ⇒ Maternal medical problems (e.g. diabetes, renal, heart diseases.)
  - ⇒ Logistical issues (e.g. history of precipitous labor, distance from hospital).
- **Fetal indications:**
  - ⇒ Fetal compromise (severe IUGR, iso-immunization)
  - ⇒ Post term pregnancies, fetal demise & CFMF.

### ❖ The state of the cervix:

- ⇒ **Using the Bishop scoring system,**
  - When the score exceeds 8, the likelihood of vaginal delivery after labor induction is similar to that after spontaneous labor.
  - Lower cervical score has been associated with a higher rate of failed induction
- ⇒ **Cervical ripening:** by prostaglandins (E1, E2, F2α) >> causing dissolution of the collagen bundles and increasing sub mucosal water content.

<u>Factors</u>	<u>Rating</u>			
	0	1	2	3
<u>Dilation</u>	Closed	1-2 cm	3-4 cm	5 cm +
<u>Effacement</u>	0-30%	40-50%	60-70%	80%+
<u>Station</u>	-3	-1,-2	-1,0	+1,+2
<u>Consistency</u>	Firm	Medium	Soft	-
<u>Position</u>	posterior	middle	Anterior	-



## **Methods of induction of labor**

### **A- Medical methods:**

#### **⇒ Prostaglandin E (More in earlier gestation):**

##### **✓ Prostaglandin E2**

- **Prepidil gel** (0.5 mg of dinoprostone) the gel is injected intracervically up to every 6 hours for up to three doses in a 24 hours.
- **Cervidil** (10 mg of dinoprostone vag. Supp.). Less rate of release than the gel but it can be removed if hyperstimulation occurs.
- **Side effects & complications:** (see Ecbolics)

- ✓ **Prostaglandin E1 (Misopristone)** oral or vaginal tablets, cheaper than PGE2, but uterine hyperstimulation is more likely to occur.

#### **⇒ Oxytocin: (More in term deliveries).**

##### **✓ DOSE:**

- 5-10 units in 500 ml saline (better to avoid water intoxication of glucose).
- The starting doses of 0.5 to 2.0 mIU/min, with ↑ of 1.0 to 2.0 mIU/min every 30 to 60 minutes (after ROM to avoid AFE).
- The maximal dose 20 mIU/minutes.

- ✓ **Oxytocin is best infused with a calibrated infusion pump:**  
Contractions (3/10 min., each lasting for 45-60sec.) with cervical dilatation of 1 cm/hour indicates that oxytocin dosing is adequate + intrapartum fetal monitoring

- ✓ **Complications:** (see Ecbolics)

### **B- Surgical methods (rupture of the membranes or amniotomy):**

#### **⇒ Artificial rupture of membranes (AROM):**

##### **• Procedure:**

- No anesthesia
- Introduce finger in cervical canal to separate the bag of forewater from presenting part.
- ROM by amniotomy hook or Kocher forceps (or a finger).
- Hear FHS for cord prolapsed.
- Usually after ROM uterine contractions will start.
- If not started within 1 hour → oxytocin drip.

• **Actions:**

- ↑ PG, helps fetal head to be applied on the cervix
- Both mechanisms facilitate the induction of labor.

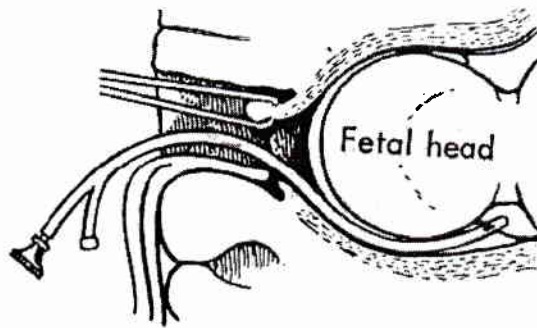
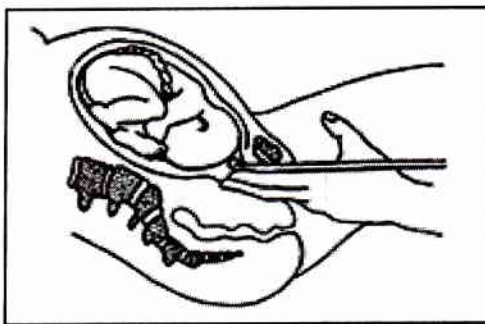
• **Risks of surgical induction:**

- **Cord prolapse:** incidence 0.5%, in cases with high presenting part
- **Intrauterine infection:** in case of prolonged induction.
- **Ante-partum hemorrhage:** in cases of low lying placenta.

	<b><u>Rupture of Fore-water</u></b>	<b><u>Rupture of Hind-water</u></b>
<b><u>Instrument</u></b>	Amniotomy hook or Kocher forceps	Drew-Smyth catheter
<b><u>Adv.</u></b>	⇒ Easy ⇒ No injury of uterus, fetus, cord, placenta.	⇒ No risk of infections ⇒ No risk of accidental He (slow drainage) ⇒ No risk of cord prolapse
<b><u>Disadv.</u></b>	⊗ Infections ⊗ Sudden drainage of liquor → Accidental He ⊗ Cord prolapse	⊗ Difficult ⊗ May injure the uterus, fetus, cord, and placenta.

**C- Combined medical and surgical:** It is the most commonly method used.

**D- Stripping of the membranes:** separation of the membranes from the cervix by the index finger >> release of PG (but may lead to infection & ROM).



# Cesarean Section

## 🔥 Definition:☺

### ❖ Delivery of a fetus

- Through abdominal & uterine incisions
- After viability (capability of the fetus of extrauterine existence 20 weeks in USA & 28 weeks in Egypt & developing countries)
- If before the fetal viability, it is called hysterotomy
- If through abdominal incision only → laparotomy (abdominal pregnancy or rupture uterus).

## 🔥 History:☺

- The term cesarean delivery dates from the time of the ancient Romans who had a law “lex cesarea” that any woman who dies in the last weeks of pregnancy should be sectioned immediately to get a living fetus.
- There is no evidence to prove that Julius Caesar was delivered by CS since his mother was alive during his wars as proved from letters sent to her.
- The word caesarean comes from the latin “caedere” which means to cut.
- 1<sup>st</sup> to do CS were the Ancient Egyptians & some primitive race in central Africa (Uganda).
- 1769 Jean Le Bas was the first to suture the uterus
- 1794 was the 1<sup>st</sup> successful operation in USA by dr Bennett on his wife.
- 1876 Porro (Italy), did the 1<sup>st</sup> successful CS hysterectomy, to avoid hemorrhage & infection, he sutured the cervical stump in the lower part of the abdominal incision to exclude it from the peritoneal cavity.

## 🔥 Incidence:

- ♣ 3 -- 5% (1960), ↑ to 20 -- 25% (1990) due to
  - ⇒ More diagnosis of dystocia (by partogram)
  - ⇒ ↑Breech delivery by CS
  - ⇒ Over diagnosis of fetal distress
  - ⇒ ↑Repeated CS اهم سبب
  - ⇒ Malpractice.

## 🔥 Indications

<u>A. Maternal</u>		<u>B. Pl</u>	<u>C. Fetal</u>
<u>Local</u>	<u>General</u>		1. Fetal macrosomia 2. Malposition & malpresentations. 3. Twins 4. Fetal distress or prolapsed pulsating cord 5. Repeated I.U.F.D 6. Postmortem CS
<u>Passages</u>	<u>Power</u>		
1. Uterine scar 2. Soft tissue or bone obstruction	Abnormal uterine action	1. Pl previa 2. Accidental hge	
		- Maternal disease - Maternal distress - Other indication	

## D-After previous operations

<u>Obstetric operation</u>	<u>Gynecological operation</u>
♣ More than 1 LSCS ♣ 1 USCS ♣ Complications during the operation ♣ Previous repair of rupture uterus ♣ Previous perforation of the uterus	♣ Repair of stress urinary incontinence ♣ Repair of vesico vaginal fistula ♣ Fothergill operation ♣ Myomectomy (sometimes)

## 🔥 Classifications: According to:

<u>Indications</u>		<u>Contraindications</u>		<u>Timing</u>	<u>Types</u>
Absolute	Relative	Abs	Relative	-Elective -Selective -Postmortem	1. Upper segment 2. Lower segment 3. Extra-peritoneal
No other alternative as severe CPD, Placenta previa	Vaginal delivery is probable but CS is safer	<b>NO</b>	☠ Fetal death ☠ Major malformations ☠ Cardiac disease ☠ Coagulopathy		

## 🔥 Time

### ❖ Elective (planned) cesarean section:

⇒ It is done before the onset of labor: Usually 1 week before EDD.

⇒ Advantages: Preparation of the patient & less risk of infection.

⇒ Disadvantages

- ✓ The fetus may not be mature e.g. due to miscalculation.
- ✓ The lower segment is not completely formed.
- ✓ Post-partum hemorrhage is more liable.
- ✓ Improper drainage of the lochia (the cervix is closed).

### ❖ Selective cesarean section: it is done after the onset of labor.



## 📌 Technique of cesarean section:

### ⇒ Preparation:

#### - Anesthesia:

- General inhalation anesthesia or
- Epidural anesthesia or
- Spinal anesthesia
- Rarely local infiltration anesthesia e.g. heart failure.
- **The patient must be fasting  $\geq 8$ hrs + antacids**
- **Investigations** → CBC, Blood group, Rh. Clotting profile & Shaving

### ⇒ Steps:

- Catheterization of bladder
- FHS are heard (مهمه جدا جدا)
- Sterilization, draping.

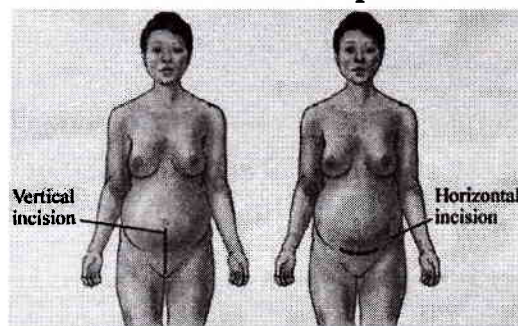
## **A. Lower segment cesarean section "This is the operation of choice".**

### **1. Opening the anterior abdominal wall:**

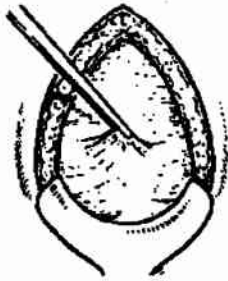
- **Skin incision:**
  - **Pfannenstiell incision** (more cosmetic & less liable to hernia but less exploratory) or
  - **Midline sub-umbilical incision.**
- **Separate recti muscles**
- **Open parietal peritoneum**

### **2. Centralize the uterus + opening the lower uterine segment** الترتيب مهم

- **The loose peritoneum over the lower segment is opened transversely.** It is retracted downwards by a Doyen retractor to retract the bladder.
- **The LUS incision:** vertical or transverse widened to 10 cm by 2 fingers or by a scissors & concave upward to avoid injury to the uterine vessels.



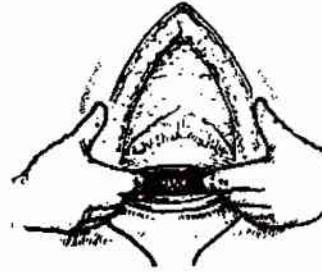
## Technique of Lower Segment Section



The loose uterovesical peritoneum is picked up.



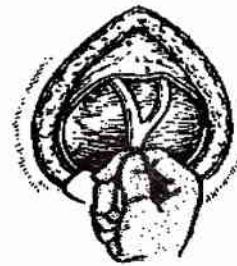
Peritoneum is cut to expose lower segment, and a small transverse incision is made.



The uterine incision is widened with the fingers.



The operator's right hand is passed into the uterus to lift the baby's head, while the assistant presses on the fundus to push the baby out.

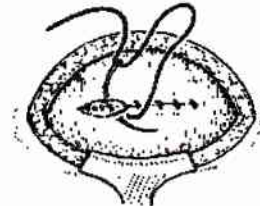
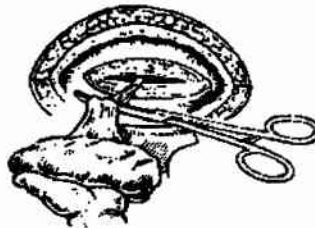


Sometimes it is necessary to extract the head with forceps.

### Lower Segment Section (continued)



Ergometrine or synthetic oxytocin is given and the placenta and membranes removed.



Uterine wound is closed with 2 layers of polyglycolic acid sutures. The peritoneum need not be closed unless there is evidence of infection.

### Vertical incision

#### Indications:

1. Varicose veins in the lower segment.
2. Contraction ring.
3. The head is deeply impacted in the pelvis.
4. Neglected shoulder presentation.

#### Advantages:

1. Less bleeding, easy repair (edges are equally thick).
2. It avoids injury of the uterine artery.

**Disadvantages:** The incision may extend downwards to involve the bladder

### Transverse incision

It is the incision of choice less liable to extend to the bladder but more liable to extend to the uterine arteries

### **3. Fetal extraction:**

- The **membranes are ruptured.**
- The **head is extracted by:**
  - Scooping by the hand (the hand is introduced below the head & push it upwards helped by fundal pressure).
  - Or levered by 1 blade of a forceps (Simpson or better Wrigley).
- The **umbilical cord is cut between 2 Kochers & deliver the placenta.**

### **4. Problems during fetal extraction:**

- If the **placenta is encountered i.e. placenta previa anterior.**
  - It is **pushed aside** to reach the presenting part or
  - The **placenta is incised & the fetus is delivered through.**
- If the **head is impacted in the pelvis:**
  - It is extracted by short forceps through the uterine incision or
  - An assistant pushes the head upwards by a hand in the vagina.
- In **breech & shoulder presentations:** the fetus is extracted from the feet

### **5. Closure:**

- ✓ **Closure of the uterus:**
  - The 1<sup>st</sup> layer for the deep portion of the uterine muscles.
  - The 2<sup>nd</sup> layer for the rest of the uterine muscle.
  - The 3<sup>rd</sup> layer for the peritoneum.
- ✓ Blood & liquor are removed from the abdomen
- ✓ The abdominal wall is closed in layers.
- ✓ The catheter is removed when the patient is ambulant

## **B.Upper segment cesarean section (classical ) خلى بالك**

### **⇒ Indications.**

1. Large fibroid in the lower uterine segment.
2. Extensive adhesions in the lower uterine segment.
3. Successfully repaired vesico-vaginal or vesico-cervical fistula.
4. Hysterectomy will be done (after cesarean section).
5. If very rapid delivery is needed (e.g. postmortem CS).

### Advantages of LSCS over USCS

1. Hemorrhage is less common: as lower segment is less vascular and the placenta site is away from the incision.
2. Stronger uterine scar: rupture uterus in next pregnancy is 0.2% after LSCS & 2% after USCS.

#### The predisposing factors to subsequent weakness of a UU\$ scar are:

- Imperfect coaptation of the edges
  - Imperfect homeostasis, which prevents perfect coaptation.
  - Erosion of the scar by the placenta.
3. Less liability for spread of infection to the peritoneal cavity, if uterine infection occurs, because the peritoneum is closed as a separate layer.
  4. Less liability for ileus and acute gastric dilatation.
  5. Less post-operative adhesions and intestinal obstruction.

### اهم سؤال Complications of Cesarean Section

#### ❖ Maternal Mortality:

- 20 /100,000 births in the US compared with 2.5 /100,000 births from VD.
- Main causes of maternal deaths are بالترتيب:
  1. Anesthetic accidents; aspiration pneumonia.
  2. Hemorrhage & Thrombo-embolic.
  3. Severe sepsis.

#### ❖ Maternal Morbidity: 8 to 12 times higher than for a vaginal birth.

##### ⇒ Intraoperative:

- Anesthetic complications.
- Injuries (bladder, ureter, bowel).
- Bleeding with consequent anemia.

##### ⇒ Postoperative (Remote) morbidity:

- **Postoperative fever** (10-50%), depending on whether CS is done electively or during labor with ROM (it is ↓ with VD 1- 3%).
- **Thromboembolic diseases.**
- **Pulmonary complications:** bronchitis, pneumonia.
- **Wound: infections +.**
  - Burst abdomen, incisional hernia (↑ with midline incision).
  - Next pregnancy: ruptured uterine scar & placenta accrete.
- **Intestine:** Adhesive intestinal obstruction, paralytic ileus.
- **Urinary tract: infection,** retention of urine, fistula.
- **Genital: endometritis,** parametritis.

#### ❖ Decreased Family, Maternal-Infant attachment.



### ❖ Fetal/Neonatal Mortality & Morbidity:

- Elective CS is the major cause of iatrogenic preterm delivery (1- 20% of RDS cases are products of elective CS), so tests of fetal maturity are done.

### ❖ Medico-legal Problems

#### ❖❖ Vaginal Delivery after Caesarean Section ❖❖

- Success rate is 60% for patients with pelvic dystocia & > 70% for patients with nonrecurring conditions; such as breech presentation or fetal distress.
- **Advantages:** ↓ maternal and neonatal morbidity & ↓ hospital time.
- **Pre-requisites of VBAC:**
  - ⇒ **Pervious CS:**
    - One LSCS (not USCS)
    - No tenderness over the scar
    - No permanent indication e.g. contracted pelvis
    - No associated indication e.g. placenta previa
    - No operative difficulties in the previous CS (no blood transfusion, bladder injury, P.sepsis)
  - ⇒ **Passenger:** Single, presented by the vertex with engaged head
- **Observations:**
  - 1<sup>st</sup> stage: VD, contractions, FWB & look for Intra-partum Hge
  - 2<sup>nd</sup> stage: Low-forceps or Ventouse
  - 3<sup>rd</sup> stage: Care about PPH for scar gapping & rupture uterus.

#### **N.B: Assessment of integrity of the scar:**

- **Weak scar is suspected if:**
  1. History to detect factors weakening the scar e.g. infection.
  2. Examination reveals tenderness over the scar
  3. In non-pregnant: Lateral view HSG shows a uterine defect.
- **Use of oxytocin** or epidural anaesthesia is not absolutely avoided in VBAC.

### **Cesarean hysterectomy**

- ❖ It means a **cesarean section followed by hysterectomy**

#### ♣ **Indications:**

- ❖ Uncontrollable post-partum hemorrhage
- ❖ Concealed accidental hemorrhage: if persistent uterine atony.
- ❖ Placenta accreta encountered during caesarean section.
- ❖ Multiple myomas needing hysterectomy.
- ❖ Operable carcinoma of the cervix.

#### ♣ **Sterilization following CS:**

- ❖ May be required after 4 or more CS or for medical indication.

# Episiotomy

## 🔥 Definition:

- It is incision of the perineum **during labor** to widen the introitus (vaginal orifice)

## 🔥 Indications

### A. Maternal (Avoid irregular perineal tears)

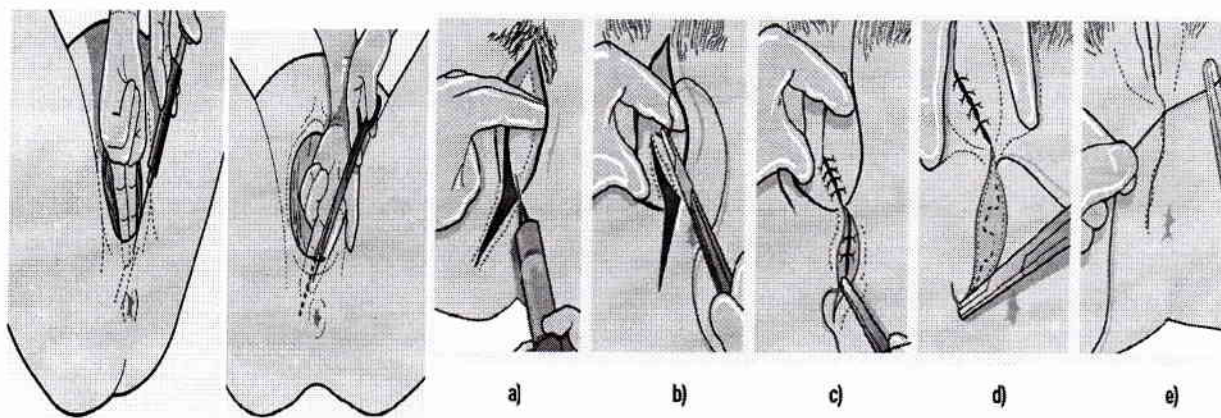
1. Primiparas especially if elderly.
2. **Perineal conditions:** rigid, scars e.g. perineorrhaphy & Vulva edema.
3. **Overstretch of the perineum:** Narrow sub-pubic arch & contracted outlet.
4. **Rapid stretch:** precipitate labor.
5. **Instrumental delivery** i.e. forceps, ventouse & destructive operations.
6. **Gynecological procedure** (prolapse, complete perineal tear)

### B. Fetal (Avoid I.C.Hge & overstretch over the perineum)

- ⇒ Face to pubis, malpresentations & Oversized fetus.
- ⇒ Preterm fetus (avoid I.C.Hge)

## 🔥 Procedure

- **Anesthesia:** local infiltration, pudendal nerve block, epidural or general
- **Timing** مهم جدا:
  - ⇒ When vulva is maximally distended by fetal head (about to tear)
  - ⇒ At the height of a uterine contraction
  - ⇒ When about 3 cm of fetal head is visible between the labia (crowning)
- **Incision includes**
  - ⇒ The posterior vaginal wall & perineal skin
  - ⇒ The muscles: levator ani & perineal muscle (deep & superficial)
- **Technique of repair (as 2<sup>nd</sup> degree perineal tear):**
  - ⇒ Local infiltration or under GEA
  - ⇒ All sutures are interrupted 2/0 chromic cat gut (or better vicryl)
    - ★ Vaginal wall → continuous or interrupted stitches
    - ★ Deep perineal muscles
    - ★ Superficial perineal muscles & then perineal skin closure
- **After care:** washing daily by antiseptics & covered by sterile pad



## Types

### 1. Median (midline) episiotomy:

- **Advantages:** less hemorrhage & pain, more widening, easy to do & repair.
- **Disadvantages:** can extend to the rectum

### 2. Medio-lateral episiotomy:

- At 4 or 8 o'clock, most commonly done.
- Advantages & disadvantages (the reverse of median episiotomy)

### 3. J of L shaped:

- Extend the incision of median episiotomy postero-laterally to avoid possible extension to the rectum & anal sphincter.

### 4. Lateral:

- Not done (↓ widening, ↑ bleeding, injure the ducts of Bartholin glands)

### 5. Schuchardt incision:

- Incision around the anal canal to produce maximal widening of the introitus
- Performed in some vaginal operations with limited exposure.

Advantages	Disadvantages
1. Clean incision easy to repair than tears 2. Reduce the duration of 2 <sup>nd</sup> stage (↓ prolapse & SUI) 3. Reduce head compression → ↓ ICH 4. Prevent over stretch of the perineum 5. Prevent perineal tears	1. ↑ blood loss & hematoma, local pain (urine retention), dyspareunia, infection☹ 2. More trauma than with spontaneous deliveries 3. Most of deliveries can be performed without Episiotomy 4. Dehiscence of the wound: infections, bad repair, ↑ tension of sutures, bad healing power.

# Obstetric Forceps

## 🔥 Definition by De Lee

- It's an instrument used to apply traction on the fetal head by 2 blades.

## 🔥 History ☺:

- It was used in the days of the Roman Empire
- Then used by the Hindus, ancient Egyptians, ancient Greeks, Avicenna, and Albucasis to deliver dead fetuses.
- The first use for living delivery was credited to Peter Chamberlin who kept it secret in his family for a century. (it was 2 short straight with cephalic curve + fenestrated blades + united blades)
- Hugh Chamberlin 1670 tried to sell the family secret in Paris. He boasted that he could deliver any woman within 8 minutes. Mauriceau who was attending a rachitic patient for 3 days, offered Hugh the opportunity to prove him self, but after 3 hours he failed & the patient died next day from rupture uterus. 50 years later, he attempted again to sell his secret in France, but was refused. Then he sold it in Amsterdam to an obstetrician Rodger Van Huysen
- In 1732, Rathlaw, in Amsterdam, published the secret.
- **English type:** double slot lock + shank
- **French type:** French lock + pelvic curve
- **German type:** German lock
- **Axis traction piece was added & Pajot's maneuver**
- **Special types:** Kielland, Piper & Barton

## 🔥 Description: Parts of Obstetric forceps:

### - The Blade Proper (7.5 inches):

- ⇒ **Fenestrated:** lightness, to minimize the head compression & to obtain firm grip (parietal bones bulge through them).
- ⇒ **Two curves:**
  - **Cephalic curve:** fit the fetal head (radius 4.5 inches),
  - **Pelvic curve:** fit the concavity of the sacrum (radius 7 inches)
  - Each blade possesses 2 curves
- ⇒ **Distance** between tips of the blades is 1 inch & 3.5 inches at the center.

### - The Shank (different length in long forceps it is 2.5 inches):

- ⇒ Allows locking of the blades outside the vagina.

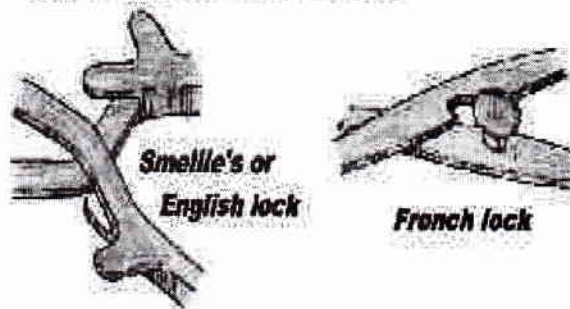


- **The Lock:**

⇒ **Types:**

- **English lock (SBN, Piper's):** It is a double slot lock; easy articulation and minimal compression.
- **French lock:** screw lock; more compression, It is not used as it causes head damage.
- **German Lock:** It is a combination of the above two (double slot lock and screw).
- **Sliding lock:** in Kielland and Barton forceps.

*There are several kinds of locks:*

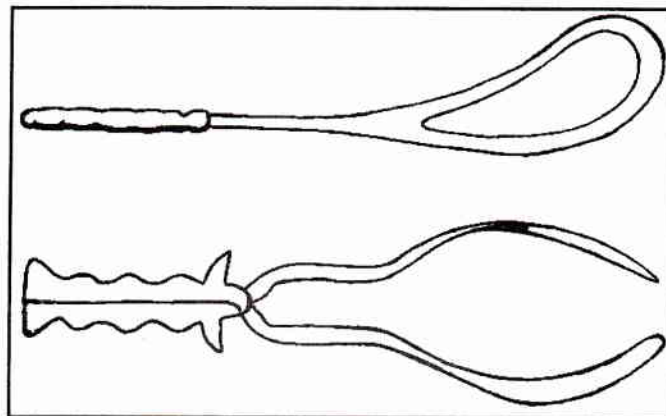


- **Handles:**

- Different lengths (5" in long forceps)
- Serrated or smooth.
- It is for application & traction

- **Axis traction piece:**

- ⇒ **Neville** → attached to handle
- ⇒ **Milne-Murray** → attached to the outer aspects of the blades
- ⇒ **Tarnier** → attached to the inner aspects of the blades
- ⇒ Nowadays, it is replaced by **Pajot's technique** is done by applying downwards pressure on the shank with left hand while applying traction with the right hand.



## ♦ Types of Forceps:

### Short shanked forceps

❖ Indications: low forceps operation or to deliver the head in case of C.S.

❖ Types:

- ⇒ Short straight forceps (Simpson forceps).
- ⇒ Short curved forceps (Wrigley forceps) الافضل : It is 11 cm in length.

### Long-shanked forceps:

- ⇒ Neville-Simpson-Barnes forceps (the commonest in use):
  - **Barnes** → There is notch between the shank and the lock.
  - **Simpson** → There are serrations on the handle & shoulder. It has an English type lock.
  - **Neville** → It has an axis traction piece fixed to handle.
- ⇒ Milne-Murray forceps:
  - There is **no notch** between the shank and the lock.
  - There are **no serrations** on the handle.
  - It has a **German type** lock (double slot lock with screw).
  - It has an axis traction piece fixed to blades from **outer aspect**.
- ⇒ Tarnier forceps:
  - There is **notch** between the shank and the lock.
  - There are **no serrations** on the handle.
  - It has a **French type** lock.
  - It has an axis traction piece fixed to blades from **inner aspect**.
- ⇒ Elliot type forceps: overlapping shanks & useful for the round, unmolded head.

### Special types of forceps

#### ❖ Kielland's forceps:

- ⇒ It is used for rotation of vertex (DTA, POP & PMP) & asynclitic head.
- ⇒ So it differs from long curved forceps in:
  - ⊙ The blades are longer and lighter.
  - ⊙ The blade proper:
    - It has a minimal pelvic curve for rotation.
    - Bevelling of inner surfaces of the blades to ↓ head compression.
    - The blades are named anterior & posterior, and not, right and left
  - ⊙ The shank:
    - Longer
    - It has a sliding lock, so it can be applied on asynclitic head.

⊙ **The handles:**

- There are two knobs which should be directed towards occiput
- When it is applied & on rotation, they should come anteriorly.

⇒ **Indications of Kielland forceps:**

- ♣ High head (better CS or ventouse)
- ♣ POP, DTA, PMP
- ♣ Asynclitic head.

☛ **Piper's forceps:**

- ⇒ It has a perineal curve on the shank to allow the application and traction on the after-coming head in a breech delivery.

☛ **Barton's forceps:**

- ⇒ There is a hinge on the anterior blade to allow the application and traction on the deep transverse arrest of the head in a flat pelvis

☛ **Zeplin forceps:** For outlet deliveries.

💧 **Action:**

- 1) **Traction** is the main action by unaided forearm & in the direction of the pelvic axis (downwards & backwards then downwards & forwards)
- 2) **Rotation:** in deep transverse arrest, persistent occipito-posterior & persistent mentoposterior (by Kielland forceps, the best)

**Old methods for rotation not used now:**

- Scanzoni double application:** very damaging to maternal soft tissue & fetus
- Key in lock method:** the forceps is applied (pelvic application) & then rotated a small arc → then removed then reapplied & rotate a small arc. This is applied till the rotation is complete.

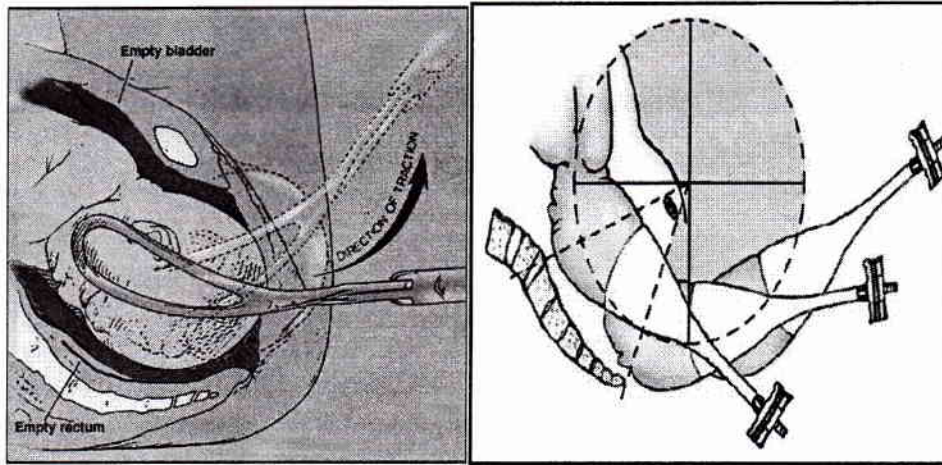
- 3) **Compression:** if severe compression → I.C.Hge
- 4) **Vectis Action:** (Scooping action during CS) by 1 blade to deliver the head
- 5) **Lever action:** side to side movement to deliver the head (should never be done)
- 6) **Stimulation of uterine contractions** and dilatation of Cx (should never be done)

💧 **Indication:** Only applied in the 2<sup>nd</sup> stage of labor

- Prolonged 2<sup>nd</sup> stage i.e. more than 2 hours in a primigravida or 1 h in multipara
- To shorten the second stage as in VBAC
- Maternal indication:
  - **Maternal distress**
  - **Maternal disease** as heart disease, pulmonary T.B. & pre-eclampsia.

- Fetal indications:

- **Fetal distress**
- **Prolapsed pulsating cord** when the cervix is fully dilated
- **Malposition & malpresentation:** OP, MA & Breech.



♣ **Types of forceps application**

⇒ **Cephalopelvic application:**

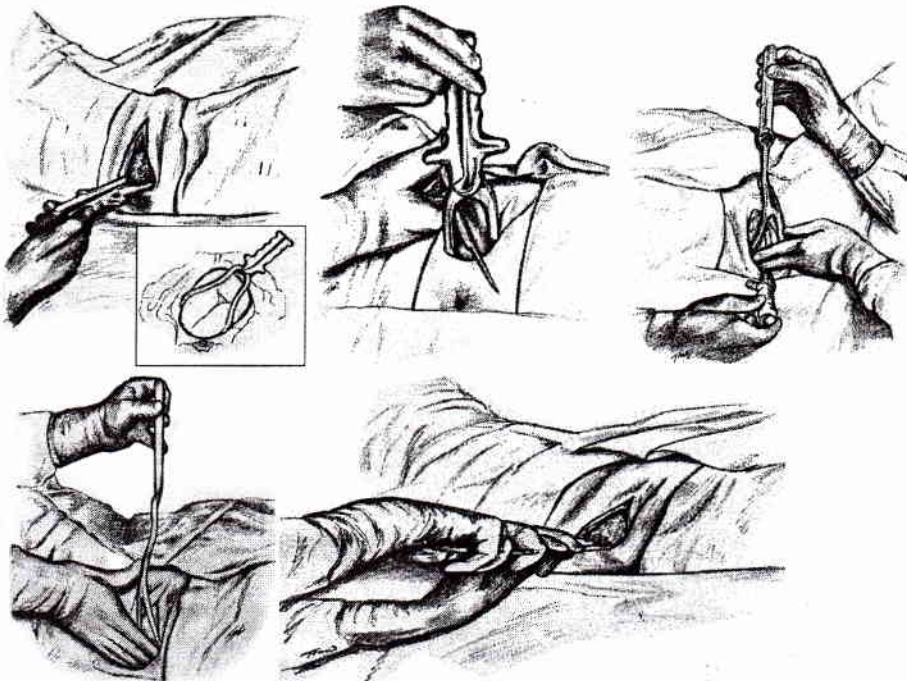
- ✓ It is the ideal application in cases of DOA, DOP & DMA.

⇒ **Cephalic application:**

- ✓ The forceps is applied on sides of fetal head along the mento-vertical diameter to decrease compression of the head → **maternal injuries**.

⇒ **Pelvic application:**

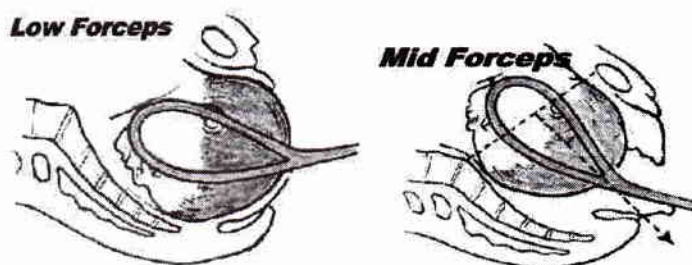
- ✓ It is applied along the pelvic wall, regardless the fetal head.
- ✓ It is easier, but may lead to marked compression of the head





### ♣ Types of forceps operations (ACOG 1988):

- **High Forceps:** The head is not engaged (not done)
- **Mid forceps:** The head is engaged & station is 0 & +1 (Pajot's can be used)
- **Low forceps:** The station +2 or more with the sagittal suture is in the middle line or in the oblique diameter ( $\leq 45^\circ$ ).
- **Outlet forceps (easiest & safest by Wrigley forceps):**
  - ⇒ The scalp is visible without separating the labia with the sagittal suture is in the middle line or  $\leq 45$  degrees.



### ♣ Preparations (prerequisites) before forceps application:

1. Antisepsis & Anesthesia (GEA, epidural (best), spinal or pudendal n block)
2. Bladder & bowel evacuation.
3. Cephalopelvic disproportion is absent & no soft tissue obstruction.
4. Contraction of the Uterus (to avoid atonic PPH).
5. Dilatation of the cervix is full.
6. Engaged head.
7. Forewater is ruptured (if intact that leads to slipping or placental separation).
8. Favorable position & presentation: OA, OP, MA & after coming head of breech.

### ♣ Contraindications of forceps application

1. **Passages:** CPD, contracted outlet, not fully dilated cervix & intact membranes
2. **Power:** uterine inertia.
3. **Passenger:** Unengaged head, unfavorable presentation (Brow, shoulder & Mento Posterior).

### ♣ Technique of forceps operations.

#### **In the occipito-anterior position**

#### ⇒ Before the application:

- ✓ Lithotomy position
- ✓ Regional or GEA & sterilization of the vulva & vagina by betadine.
- ✓ Catheterization of the bladder (avoid atony & injury) & drapping.
- ✓ EUA (exclude the contraindications & the prerequisites must be present).

⇒ **Application:**

- ✓ **The left blade** is applied 1<sup>st</sup> by the left hand in the sacral hollow (guided by the right hand) then rotated to occupy the left side of the pelvis.
- ✓ **The right blade** is then applied by the right hand in the sacral hollow (guided by the left hand) then rotated to occupy the right side of the pelvis.
- ✓ **The two blades are locked.**
- ✓ **Unlocking is done** in between uterine contractions to minimize compression of the fetal head.

⇒ **After application:**

- ✓ **Traction** (helped by Pajot's or axis traction) should be:
  - Gentle (unaided forearm only).
  - Intermittent (not more than 25-30 sec) with uterine contractions.
  - Downwards & backwards till the occiput appears then forwards.
- ✓ **Episiotomy** to avoid perineal tears (on crowning)
- ✓ **Examination** of the fetus & birth canal after delivery (Fundoperineal).

**Kielland forceps in deep transverse arrest**

⇒ **The anterior blade** (known by orientation of the forceps outside the body so that the knobs point towards the occiput) **is applied 1<sup>st</sup> by one of the following methods:**

- ✓ **The wandering method:**
  - The anterior blade is guided into the lateral side of the pelvis & then moved over the head to become anterior (the safest).
- ✓ **The direct method:**
  - The anterior blade is introduced under symphysis pubis with the cephalic curve towards the fetal head. (Difficult)
- ✓ **The classic method:**
  - The anterior blade is applied with the cephalic curve towards the symphysis pubis, then rotated 180. It is dangerous as it may cause injury of the LUS.

⇒ **The posterior blade** is applied along the concavity of the sacrum.

⇒ **The blades are locked (to correct asynclitism).** The 2 knobs should be directed towards the occiput to guide the direction of rotation. The head is rotated to become OA, and then extracted.

## 💧 **Complications:**

### ❖ **Maternal complications:**

#### ⇒ **Injury e.g.**

- ✓ Perineal, cervical tears, rupture uterus, ligaments, coccyx or symphysis.
- ✓ Bladder & ureteric injury.

#### ⇒ **Postpartum hge:** Traumatic or Atonic.

#### ⇒ **Puerperal sepsis.**

#### ⇒ **Remote complications:** Genital prolapse & cervical incompetence.

### ❖ **Fetal complications:**

#### ⇒ **Intracranial hge:** Due to tear of the vein of Gallen due to marked fetal head compression with elongation of mento-vertical diameter.

#### ⇒ **Head & neck injuries:** skull fractures, Cephalhematoma & Facial nerve injury

#### ⇒ **Infection & Asphyxia:** due to intracranial hge & cord compression by the blades.

## Failed forceps

## 💧 **Definition:**

- ❖ Failure to apply the blades or to extract the head by the forceps inspite or repeated & persistent attempts.

## 💧 **Causes (usually undiagnosed):**

<u>In the passages</u>	<u>In the passenger</u>
<ul style="list-style-type: none"><li>⊙ Contracted pelvis</li><li>⊙ Constricting ring</li><li>⊙ Incomplete cervical dil.</li><li>⊙ Undiagnosed pelvic tumor</li></ul>	<ul style="list-style-type: none"><li>⊙ Non-engagement of fetal head</li><li>⊙ Malposition as POP</li><li>⊙ Hydrocephalus</li><li>⊙ Conjoined twins</li></ul>

## 💧 **Management:**

### ❖ **Very dangerous & liable to complications so not done**

#### ⇒ **The forceps is removed,** the birth canal is examined to detect the cause

#### ⇒ **Deal with the cause:** e.g.

- ✓ **Contracted pelvis:** CS is done
- ✓ **Constriction ring:** Amyl nitrates & immediate forceps application
- ✓ **Not fully dilated cervix:** CS if living fetus & wait for full dilatation if dead.

### **Trial forceps (tentative forceps)**

- ❖ Application in cases of borderline CPD knowing in advance that it may fail.
- ❖ Mild traction is done, if fails → CS.
- ❖ Any forceps application should be considered a trial forceps.

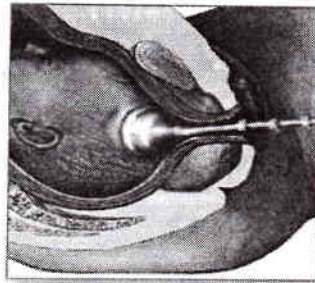
### **Elective forceps (prophylactic forceps)**

- ❖ The principle was done by De-lee that the forceps is applied after 20 min after full cx dilatation when the head is low (outlet forceps).
- ❖ Aim is to decrease:
  - Maternal & fetal distress.
  - Compression of the head.
  - Overstretch of the perineum. (Episiotomy is the commonest obstetric procedure followed by prophylactic forceps).

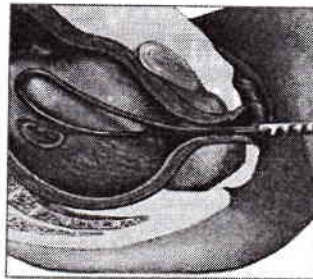


# THE VACUUM EXTRACTOR (VENTOUSE)

Vacuum-assisted birth



Forceps-assisted birth



## 🔥 Definition:

- It is used to apply traction on the fetal head by a negative pressure or vacuum between its cup and the head.

## 🔥 History:

- **1705** 1<sup>st</sup> invented by James Yonge.
- **1849** Simpson developed the first practical instrument for vacuum extraction
- **1957** Malmstrom described the modern instrument used nowadays.

## 🔥 Parts:

- Cup:
  - Silastic {Kobayashi} or metallic {Malmström}.
  - They are available in 3 sizes (4, 5 and 6 cm in diameter).
  - Soft silastic cups are preferred to metal as they are easier to apply.
- Traction piece (chain)
- Vacuum bottle

## 🔥 Technique:

- Sterilization, catheterization, drapping, examination
  - ⇒ Apply largest possible cup (5 or 6) (less negative pressure over the scalp).
  - ⇒ Negative pressure is ↓ by 0.2kg/cm<sup>2</sup>/2min. to a maximum of -0.8 kg/cm<sup>2</sup>.
  - ⇒ The negative pressure creates an artificial caput succedaneum (chignon) which disappears spontaneously after delivery
  - ⇒ Rotation & traction are done at the same time.
  - ⇒ Considered failed if slipped > 3 times or >15 min without delivery → CS

## 🔥 Indications:

- The same indications of the obstetric forceps.
- Uterine inertia before full dilatation of the cervix.
- Prolapsed pulsating cord before full dilatation of the cervix.

### ♣ Advantages over the Obstetric Forceps:

- Less traumatic on **maternal tissues** & does not **compress** the fetal head.
- Can be applied.
  - **Without anesthesia** so it is ideal for cardiac patients
  - **Not fully dilated cervix** (7 cm or more )
  - **High or unrotated head**
- It does not occupy space and so it does not interfere with pelvic capacity.

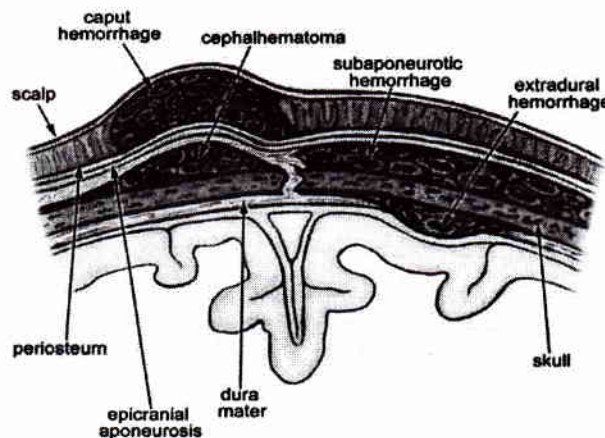
### ♣ Complications:

#### A) Fetal:

- ⇒ Lacerations of fetal scalp (gangrene of ht scalp if applied >45min).
- ⇒ Cephalhematoma.
- ⇒ Fracture of the skull bones.
- ⇒ Intracranial hemorrhage.

#### B) Maternal (less):

- ⇒ Injury of vagina or cervix if included under the cup.

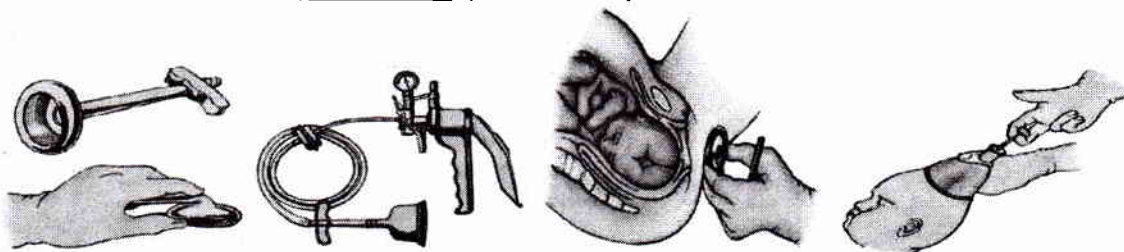


### ♣ Contraindications:

- Maternal: Cephalopelvic disproportion.

- Fetal:

- ⇒ Non vertex presentation (as face, brow or breech).
- ⇒ IUFD (no caput).
- ⇒ Preterm baby less than 34 weeks for fear of intracranial Hge.
- ⇒ High head this is a relative contraindication.
- ⇒ Severe fetal distress (takes time).



# DESTRUCTIVE OPERATIONS

## ♦ Definition:

- These are operations done to ↓ fetal size or diameters to facilitate delivery
  - Very dangerous & rarely done now (CS is safer)
  - Done only on dead fetus or major CFMF
  - Contraindicated in living non malformed fetus

## ♦ Types:

### Craniotomy

## ♣ Indications:

- For perforation of head to decrease its size + evacuation of its content
- Hydrocephalus (main indication), may perforate with spinal needle → escape of CSF, ↓ size of head
- Large head
- Retained aftercoming head of breech
- Contracted pelvis

## ♣ Contraindication:

- ❖ Living fetus
- ❖ Extreme degree of contracted pelvis
- ❖ Insufficiently dilated cervix

## ♣ Technique:

- ❖ GEA, sterilization, catheterization, examination under anesthesia
- ❖ Fix the head by assistant's hand, forceps, volsellum to head
- ❖ Use Oldham's or Simpson perforator ....introduce while guarding blade with hands {push blades to shoulders & open, repeat at right angles}

### ❖ Site of perforation:

- Vertex in one parietal bone (better near anterior fontanel than posterior).
  - Brow in frontal bone.
  - Face in the orbit of mouth.
  - After coming head in occipital bone.
- ❖ Introduce perforator inside the brain to destroy brain matter or wash away by Bozeman catheter
  - ❖ Deliver the head by
    1. Forceps (difficult), volsellum
    2. Cranioclast or crush face
    3. Combined cranioclast & cephalotribe
    4. Exploration of the genital tract



N.B: In hydrocephalic after coming head the C.S.F is drained by passing a catheter along the spinal canal through a spina bifida if present or after dividing the vertebral column transversally in the cervical or upper dorsal region.

### 🔥 Complications:

- ❖ Injuries (uterus, cervix, vagina, perineum, bladder, rectum).
- ❖ Hemorrhage & infection.
- ❖ Fistulae.

## Decapacitation

### 🔥 Indication:

- ❖ Cutting the neck to separate head from the body.
- ❖ Neglected shoulder.
- ❖ Locked twins.
- ❖ Double headed monster.

### 🔥 Technique:

- ❖ GEA, sterilization, catheterization.
- ❖ Examination under anesthesia.
- ❖ Fix neck by pulling arm to be nearer.
- ❖ Decapacitation hook:
  - Braun ....to fracture cervical spine then cut with embryotomy scissors.
  - Ramsbotham (sharp).
  - Galabin (serrated).
- ❖ Delivery of the trunk by traction.
- ❖ Delivery of the head by forceps, cranioclast or jaw traction.
- ❖ Explore genital tract.

### 🔥 Complications: As craniotomy

## Cleidotomy

- ❖ Cutting one or both clavicles in:
  - Shoulder dystocia (may be done on living)
  - Some cases of neglected shoulder

## Evisceration

- ❖ Opening of thorax or abdomen & removal of fetal viscera
- ❖ Indicated in obstructed labor due to
  1. Thoracic or abdominal swelling
  2. Some cases of shoulder dystocia

## Spondylotomy

- ❖ Division of fetal spine (in neglected shoulder when neck is not in reach).



# Control of pain during labor

## Differences between obstetrical & surgical analgesia

- Drugs pass the placenta → neonatal respiratory depression
- Duration of analgesia may be required for  $\geq$  hours
- Drugs should exert little or no effect on uterine contractions
- Labor can occur at any time (emergency), so aspiration of gastric contents to avoid Mendelson syndrome (the commonest cause of anesthetic death)
  - Prophylaxis:
    - ◆ Fasting for at least 6 hours if possible
    - ◆ Reduce gastric acidity (cimetidine) before operation

## ◆ Pain pathways:

- Uterus, cervix, upper vagina: Nerves that accompany the sympathetic fibers and enter the spinal cord at T10, 11, 12 & L1 segment
- Lower vagina and perineum: Pudendal nerve (S2, 3, 4).

## ◆ Pharmacological pain relief

❖ Narcotic analgesic: given in the active phase of cervical dilatation, cesarean section after delivery of the fetus and postpartum.

- ⇒ Meperidine HCL (Pethidine) 100-150 mg IM).
- ⇒ Morphine sulfate (10-15 mg IM).

❖ Inhalation analgesics: given in the 2nd stage of labor.

- ⇒ Nitrous oxide and oxygen.
- ⇒ Trichloroethylene (Itrilene).
- ⇒ Methoxyflurane (penthrene).

❖ Anesthesia:

⇒ General anesthesia:

### 1. Intravenous agents.

- Thiopentone (Intraval 0.5 -1 gm)
- B. ketamine (ketalar).

### 2. Inhalation agents:

- Nitrous oxide 80% and O<sub>2</sub>
- Trichloroethylene (trilene) & O<sub>2</sub>.
- Halothane (fluthane).

⇒ **Regional anesthesia:**

- **Epidural block** → Lumber route → sacral rout
- **Sub-arachinoidal (spinal) block.**
- **Para-cervical block.**
- **Pudendal block**
- **Perineum infiltration** (1% lignocaine in 20 ml in episiotomy)

🔥 **Non pharmacological pain relief**

- ❖ Voluntary muscle relaxation & respiratory exercise spare O<sub>2</sub> for contracting uterus. So, uterine ischemia is diminished & consequently pain relieves
- ❖ Acupuncture

**N.B.S**

🔥 **Continuous epidural anesthesia:**

- ❖ Local anesthetic 0.5% bupivacaine or 1.5% lignocaine hydrochloride is instilled at 3 to 4 h intervals through a catheter inserted into epidural space.
- ❖ This gives the patient complete freedom from the pain of labor.
- ❖ Most obstetricians consider epidural anesthesia to be indicated if the patient asks for it.
- ❖ Planned induction techniques are often accompanied by epidural anesthesia, in which the catheter is inserted before the onset of contractions
- ❖ Absence of maternal distress must not mislead obstetricians into ignoring signs of obstruction & effect of prolonged contractions on mother & fetus
- ❖ Epidural anesthesia is not recommended when has been a previous CS.

🔥 **Para cervical nerve block:**

- ❖ Autonomic fibers serving the uterus and vagina accompany the vessels and form a plexus lying in the parametrial tissues which is infiltrated by injection of 10ml of 1% lignocaine with 1:200.000 adrenaline into each lateral vaginal fornix, using a transvaginal guarded needle, aspiration must be done before injection to exclude puncture of a blood vessel
- ❖ PCB has not gained much acceptance because of short duration of analgesia (2hours at the most), the difficulties of access during established labor & because the anesthetic crosses the placenta & causes fetal bradycardia due to acidosis & hypoxia, fetal deaths from this cause have been reported

🔥 **Pudendal nerve block**

- ❖ The fore finger is placed on the ischial spine (behind which runs the pudendal nerve) & a long needle is passed via the ischiorectal fossa & 5ml of lignocaine are injected.
- ❖ It is advisable to withdraw the plunger before injecting to make sure that needle is not in a blood vessel.

## 💧 Epidural anesthesia

- ❖ The epidural space is about 4mm wide & lies between the dura & the periosteum of the vertebral canal.
- ❖ It is limited above at the foramen magnum where dura & periosteum fuse & below by the ligament covering the sacral hiatus
- ❖ Local anesthetic can be injected into this space which is traversed by the spinal nerves and produce the same effect as a spinal block without the risk of headache, meningioma or nerve root trauma

### ❖ Complications:

1. Mild hypotension 20 %
2. sepsis
3. Needle inserted into cerebrospinal space (this is failure of technique)
4. Bladder atony and increased need for catheterization about 40%

## PELVIMETRY

⚙ Definition: Pelvimetry is the measurement of the pelvic capacity by:

- 1) External pelvimetry.
- 2) Internal pelvimetry.
- 3) Radiographic pelvimetry.
- 4) The tests of disproportion as the fetal head is the best pelvimetry.

### 1. External pelvimetry

#### • Of the pelvic inlet:

- measured by using Martin's pelvimetry.
- These are of minor importance (as they measure the diameters of the false pelvis) but they may give idea about the presence of rachitic pelvis in which the difference between the intercrestal diameter and the interspinous diameter is diminished or lost (equal each other).

#### • Of the pelvic outlet:

- a) The subpubic angle is estimated by direct palpation.
- b) The bituberous diameter: by the closed hand (admit 4 knuckles) or by Jericho pelvimetry. It measures 11 cm.
- c) The anteroposterior diameter: the distance between the lower margin of the symphysis pubis to the tip of the sacrum: 13cm (due to the backward mobility of the coccyx during delivery).

## 2. Internal pelvimetry

A. **Measurement of the diagonal conjugate** distance 12.5 cm. By subtracting 1.5 cm from it the true conjugate: 11cm.

B. **Rough estimation**- by manual palpation of the following:

- 1) The transverse diameter of the brim.
- 2) The sacral concavity.
- 3) The ischial bispinous diameter.
- 4) The length of the sacro-spinous ligament (2 fingers could be placed on it normally) denoting the width of the sacro-sciatic notch.
- 5) The capacity of the subpubic angle.
- 6) Also a test for disproportion is done. If the head is not engaged. The internal pelvimetry is done at 36 week's especially in primigravida.

## 3. Radiographic pelvimetry

- For detection of the shape of the pelvis and its measurement.
- **3 views are known:**
  - 1) The lateral pelvimetry: the most useful view.
  - 2) The brim pelvimetry.
  - 3) The pubic arch pelvimetry. The subpubic angle of a normal female pelvis: 80-95 degrees.

### Cephalometry

**Definition:** Measurement of the diameters of fetal head.

- 1) Radiologic.
- 2) Ultrasonic.

## 4. Tests for disproportion

- The best pelvimetry is **fetal head**.
- These tests estimate the relative size of the fetal head and the maternal pelvis by abdominal or abdominal and vaginal palpation.

### i. Pinard's method:

- The patient empties her bladder and rectum
- In the semisitting positing (this brings the pelvic axis into line with the uterine axis).
- Push the head with one hand and the fingers of the other are put on the symphysis pubis.



**Muller`s method:**

- By one hand the head is pushed in the pelvis and the relation to ischial spines is felt by the fingers of the other hand in the vagina.

**ii. Muller-Kerr`s method:**

- The patient in the dorsal position.
- By one hand the head is pushed in the pelvis and the other hand in the vagina with the thumb on the symphysis pubis.

**Interpretation of disproportion tests**

- a) **No disproportion** the head made to enter easily in the pelvis.
- b) **Disproportion is present**: when the head cannot enter the pelvis.
  - i. **First degree disproportion**: When the head flushes with the pubis. Trial labor is done for these cases.
  - ii. **Second degree disproportion**: When the head overrides the pubis. Vaginal delivery cannot occur and C.S is needed.

# Operative gynecology

## General rules

### 1- Timing

- Postmenstrual
- 3 – 6 months after labor

### 2- Preparation of any operation

- Position: lithotomy or dorsal position
- Anesthesia: general or paracervical or regional
- Bimanual examination of the uterus: size, mobility, adnexa
- Sterilization, catheterization, drapping.
- Expose the vagina: by self retaining Auvard's speculum
- Grasp the cervix by volsellum
- Uterine sounding: to know the length & direction of uterus.

### 3- Indications

	diagnostic	therapeutic
Congenital		
Amenorrhea		
Bleeding		
Contraception		
Infertility		
Neoplasm		
Obstetric ind.		

### 4- Contraindications

- Amenorrhea of unknown nature (may be pregnant)
- Bleeding of unknown nature (may be cancer)
- PID → spread

### 5- Complications

1- Anesthesia

2- Early:

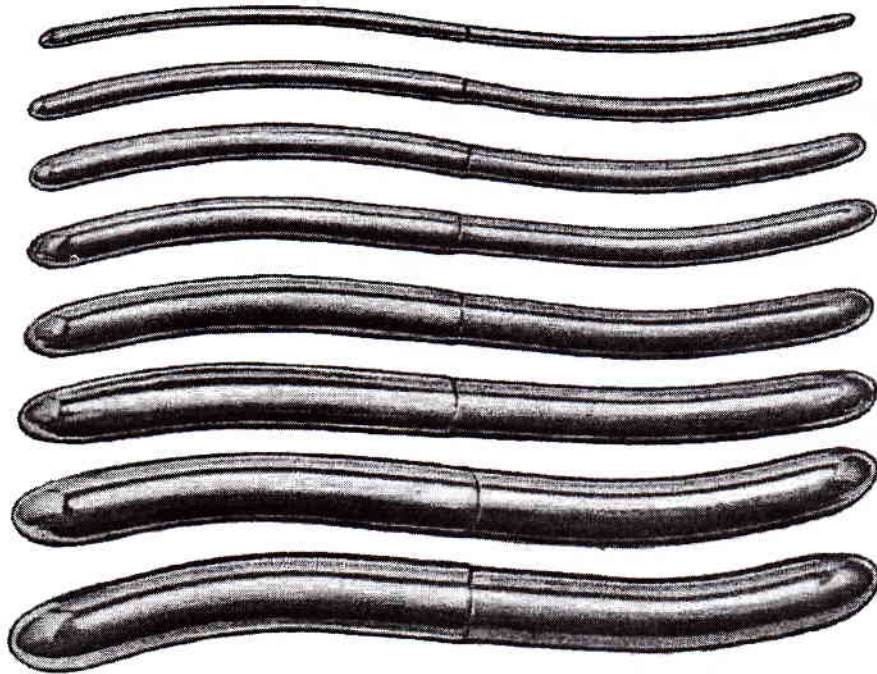
- Hemorrhage, injury, infection
- Abdominal operation: injury to ureter, intestine
- Vaginal operation: adhesions, dyspareunia
- Media used: air in laparoscopy, dye in HSG & HYCOSY

3- Late

## DILATATION OF THE CERVIX

♣ **Types:** different sizes known by the NO typed from (0.5-16)

◆ **Hegar:** has uniform thickness throughout its length (single or double ended);



◆ **Fenton:** tapers gradually towards its tip (single ended).

### ♣ **Indications:**

#### 1- **Dilatation alone:**

- a. Spasmodic dysmenorrhea (<20 years)
- b. Cervical stenosis (pin hole in infertility 20 – 40 years)
- c. Drainage of pyometra or hematometra (>40 years)

#### 2- **Dilatation with cervical procedures:**

- a. Amputation
- b. Trachelorrhaphy
- c. Cautery especially in PG

#### 3- **Dilatation with uterine procedures:**

- a. Curettage
- b. Polypectomy
- c. Introduction of radium

#### 4- **Dilatation with tubal procedures:**

- a. Insufflations
- b. HSG

### ♣ Contraindications:

- Active infection
- Intact pregnancy

### ♣ Technique

#### ◆ Before dilatation:

- G. anesthesia.
- Lithotomy position
- Bimanual exam.
- Expose the cervix by speculum & grasp it by volsellum
- Sounding of the uterus

#### ◆ Dilatation of the cervix:

- ⇒ It is held like a pencil & pushed gently towards the cervical canal.
- ⇒ 1<sup>st</sup> resistance is the internal os.
- ⇒ Dilator should be left for 1/2 min. then removed & next larger one is introduced until the desired dilatation is reached
- ⇒ No. 8 → for curettage
- ⇒ No.14 → for cx amputation.
- ⇒ No.12 → to treat spasmodic dysmenorrhea.

### ♣ Complications

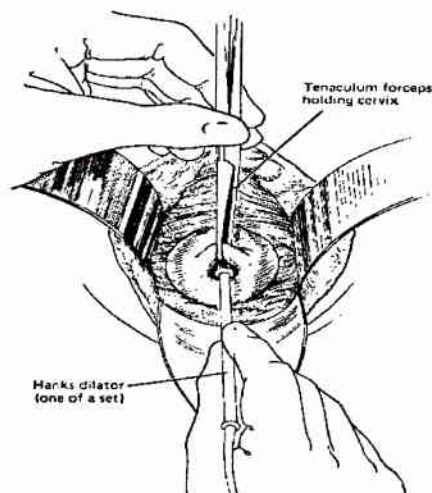
- ◆ Infections
- ◆ Perforation of the uterus
- ◆ Neurogenic shock
- ◆ Cervical injury

### ♣ Limits of dilatation

- ◆ Usual dilatation is needed till 1 degree below the uterine length
- ◆ Smallest dilator (0.5) for pin hole cervix while the largest for cervical amputation & spasmodic dysmenorrhea.

### ♣ Other methods of dilatation

- ◆ Prostaglandin analogues (vaginally or intracervically)
- ◆ Hygroscopic dilators (dilapan) used in therapeutic abortion.





# CURETTAGE

## 1- **Loop curette (blunt or sharp):**

⇒ Blunt is used if the uterus is liable to perforation e.g. cancer, recent pregnancy & infections.

## 2- **Biopsy curette e.g. Novak or Sherman**

⇒ Anesthesia & cervical dilatation is not needed

⇒ Small diameter to obtain small endometrial strip e.g. detect ovulation.

## 3- **Fundal curette:** has tapering end to curette fundus & angles

## 4- **Flushing curette (Rheinstadter's):** curette + washes the decidua after evacuation.

## 5- **Pipelle** → small, used without anesthesia.

## 6- **Suction** → **Carmen or Vabra aspirator** (as in septic abortion or VM)

### 🔥 **Indications:**

#### ◆ **Diagnostic:**

⇒ Ovulation/LPD → Premenstrual endometrial biopsy

⇒ TB endometritis

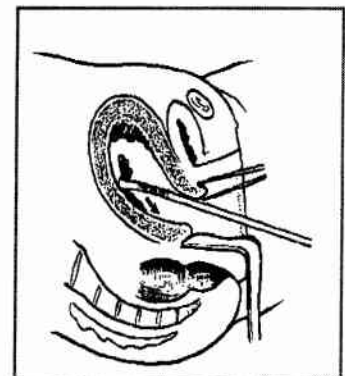
⇒ Abnormal uterine bleeding

#### ◆ **Therapeutic:**

⇒ Postpartum & postabortive bleeding

⇒ Endometrial & cervical polyps

⇒ DUB.



### 🔥 **Technique:**

1- Position: lithotomy

2- Anesthesia: general anesthesia or paracervical block

3- Bimanual dilatation of the uterus → size, mobility, adnexa

4- Sterilization → catheterization → toweling

5- Expose the cervix → by self retaining Auvard's speculum

6- Grasp the cervix → by volsellum (for gentle traction & cervix manipulation)

7- Uterine sounding → to prevent perforation

8- Gradual dilatation (up to no. 10) start with small one & hold it like a pencil.

⇒ Introduce till resistance of internal OS is overcome

⇒ Leave for 1/2 minutes → continue with a larger one

9- Curettage the endometrium till gritty sensation is felt in the following order

⇒ **Ant. Wall → Post. Wall → Fundus → Lateral wall.**

⇒ Use sharp or blunt curette (ring forceps or polypectomy)

- ⇒ Curette fundus, lateral, anterior, posterior walls (from above downwards).
- ⇒ Stop on feeling gritty sensation (as deciduas basalis is reached).
- ⇒ Send specimen for histopathology (formalin 4% or saline).

10- In fractional curettage: cx is curetted before dilatation.

### 🔥 Complications of D&C

- RULE: minor surgeries is taken lightly or done without strict indications.

#### 1- Shock

- A. Neurogenic: due to dilatation without anesthesia.
- B. Hypovolemic: due to excessive bleeding (trauma, perforation, retained parts, 2ry hemorrhage).

#### 2- Cervical lacerations

- A. Due to rapid or excessive dilatation.
- B. Complications: Hge, infection, incompetent isthmus.
- C. Treatment: suturing the tear.

#### 3- Perforation of the uterus.

##### A. Predisposing factors:

- i. RVF or acutely AVF uterus.
- ii. Soft uterus (Pregnancy, sepsis).
- iii. Friable uterus (malignancy).

##### B. Peroration may be:

- i. Anterior wall & opens the vesico-vaginal pouch.
- ii. Posterior wall & opens the Douglas pouch
- iii. Laterally with injury of the uterine artery → broad ligamentary hematoma (difficult to diagnose & treat)

##### C. Danger:

- i. Hge, infection
- ii. Injury to intestine or omentum
- iii. Rupture of scar in subsequent pregnancy.

##### D. Diagnosis

- i. Sudden release of resistance
- ii. Vaginal bleeding
- iii. Passage of sound > expected length of the uterus.
- iv. Prolapse of intestine or omentum
- v. Later on → bleeding, infection (peritonitis & fever).

##### E. Prevention:

- i. Proper evaluation of uterine size, direction & consistency.
- ii. Straighten the uterus by traction of the cervix with volsellum.
- iii. Holding dilator like a pencil.
- iv. Avoid excessive force.

## **F. Treatment:**

- i. Observation for:
  - a. Vital signs & internal hemorrhage.
  - b. Antibiotics.
- ii. Laparotomy done if:
  - a. Abdominal contents prolapsed through perforation.
  - b. Internal hemorrhage.
  - c. Severe vaginal bleeding
  - d. Malignancy.
- iii. Uterus is repaired (small tear) or removed (if excessive injury or MP)  
+ exploration of the intestine
- iv. Slight bleeding & stable conditions → conservative treatment
  - a. Ergotamine & Antibiotics + Fowler's position..
  - b. Evacuation is completed guided by laparoscopy.
  - c. Keep the patient under observation (pulse, BP, temperature, US for peritoneal fluids in DP.
  - d. In next pregnancy: Risk of rupture scar

### **4- Incomplete evacuation**

- It leads to hemorrhage & infection
- Treatment: re-evacuation

### **5- Infection**

### **6- Anesthesia complications.**

### **7- Remote complications**

- A. Incompetent isthmus due to dilatation.
- B. Asherman's S (amenorrhea traumatic) due to curettage of the stratum basalis.

## UTREINE SOUNDING

### 🔥 Description

- ◆ It is malleable metal instrument with a blunt tip
- ◆ It marked in centimeters or inches.
- ◆ It is slightly curved near the tip to adopt the angle of uterine flexion

### 🔥 Technique

#### ◆ Before sounding:

1. G. anesthesia.
2. Lithotomy position.
3. Bimanual exam.
4. Expose cervix by speculum & grasp it by volsellum.

#### ◆ Sounding:

- ⇒ Sound is passed till 1<sup>st</sup> resistance is at internal os (measure the cervical canal)
- ⇒ Then pushed further till 2<sup>nd</sup> resistance is at the fundus (to measure uterine cavity)

### 🔥 Uses:

- 1- Measurement:

**A- Uterine length** before dilatation.

$$\text{Uterine index} = \frac{\text{length of uterus} - \text{length of cervix}}{\text{Length of cervix} \times 2}$$

Normally = or > 0.75

**B- Uterine hypoplasia** (<2.5inches).

**C- Supra vaginal elongation** of the cervix in prolapse.

**D- Differentiate** chronic inversion from fibroid polyp bulging through the cervix.

- 2- Diagnose the direction of the uterus.
- 3- Diagnose cervical stenosis (inability to pass the sound).
- 4- Detect uterine contents e.g. polyp, septum, IUCD.
- 5- Differentiate cervical & uterine polyps.
- 6- Differentiate between uterine inversion, polyp & prolapse.
- 7- Click test, Clark test, Rock test.

🔥 Dangers: Bleeding, uterine perforation, infection, abortion.



# HYSTERECTOMY

## Indications

1- Obstetrical	2- Gynecological
<b>A. <u>Uncontrolled PP hge.</u></b> - Atonic (severe) - Rupture uterus (old or extensive) - Placenta accrete - Couvelaire uterus <b>B. <u>Severe uterine infection</u></b> (postabortive- postpartum) <b>C. Vesicular mole.</b> <b>D. <u>Ectopic pregnancy</u></b> (cornual, cervical or rudimentary horn)	<b>A. Congenital:</b> cervical atresia <b>B. Traumatic:</b> uncontrollable hge during myomectomy <b>C. Inflammatory:</b> bilateral PID or pelvic abscess in old patient, genital TB. <b>D. Neoplastic</b> - Benign: <b>fibroid</b> , benign ovarian tumors - Malignant neoplasms: CX, body, ovary. <b>E. Miscellaneous:</b> - <b>DUB.</b> , endometriosis - 2 <sup>nd</sup> & 3 <sup>rd</sup> degree prolapse.

## Types:

### 1 - Abdominal hysterectomy

#### A. Total hysterectomy (body & cervix are removed)

##### i. Advantage (preferred in the following reasons):

1. Better drainage through the opened vagina → less risk of hematoma.
2. Avoids cervical stump carcinoma.
3. If the cervix is infected, the source of infection is removed.

##### ii. Disadvantages:

- Difficult & longer
- More injury to the bladder, ureter, rectum
- Vault prolapse (now it is believed that it is less than subtotal)
- Pelvic infection
- dyspareunia

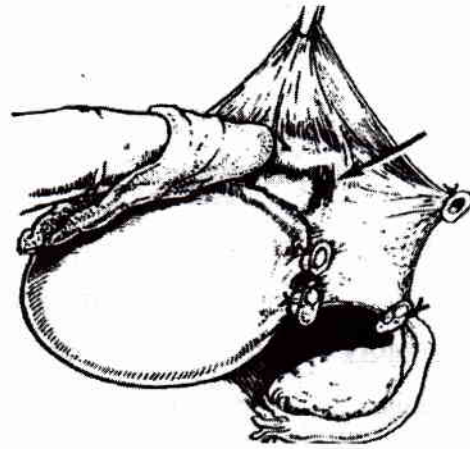
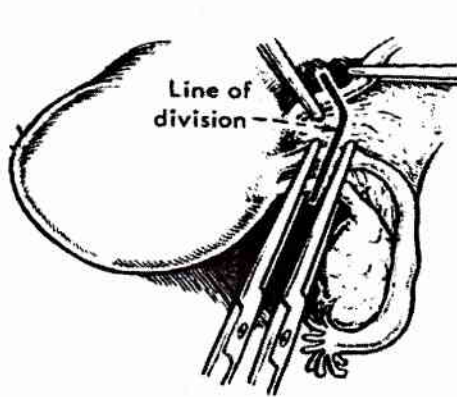
#### B. Subtotal hysterectomy (body is removed & cervix is left).

##### ⇒ Advantage

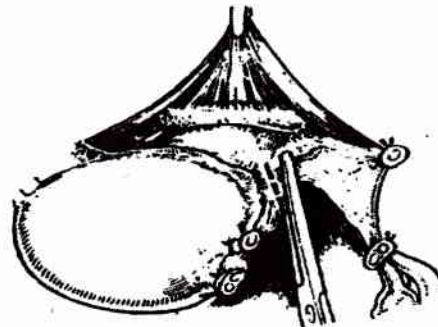
1. Easier & quicker
2. Less incidence of uterine & ureteric injury.
3. Less pelvic infection (vagina is not opened).
4. Cervix supports the vaginal vault.
5. Cervical mucus lubricates the vagina (cervical orgasm).

##### 6. Done if:

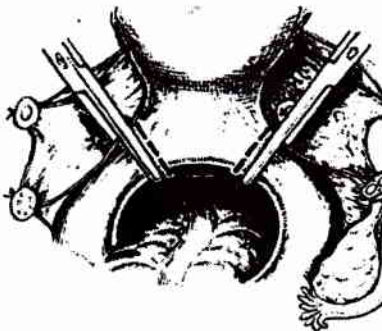
- a. Rapid hysterectomy is needed e.g. Post-partum hemorrhage.
- b. Extensive adhesions around the cervix.



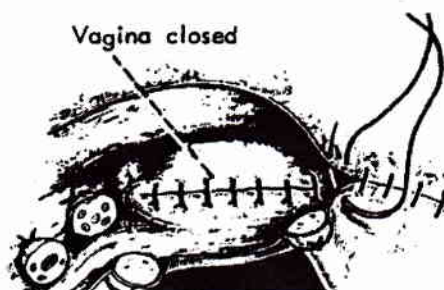
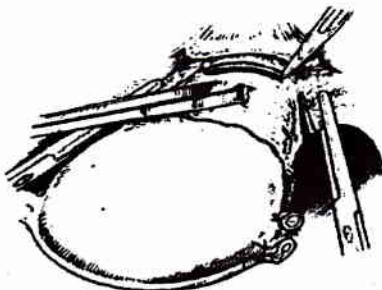
**Cutting of round & ovarian ligaments    downward displacement of the bladder**



**Ligation of uterine artery**



**cutting of the uterosacral ligament**



**Opening the vagina the removal of the uterus**

⇒ **Disadvantages:**

- Risk of stump carcinoma → 0.1 – 1%
- Menstruation if high subtotal
- Poor drainage → hematoma

**C. Extended hysterectomy:** TAH + removal for upper vagina + medial part of cardinal ligament. It is for treatment of microinvasive cervical CA (IA2)

**D. Pan hysterectomy** (TAH + BSO).

**E. Radical hysterectomy** (Wertheim's operation) → removal of

- TAH + BSO
- The whole parametrium (broad ligament)
- Pelvic ligaments & LN

**F. Extended radical hysterectomy** (removal of periurethral tissue & up to  $\frac{3}{4}$  of the vagina).

**G. Ultra radical hysterectomy** (= exenteration → anterior, posterior or total).

**H. In obstetrics:**

- ★ **Supra-vaginal hysterectomy** (if done peripartum {the cervix is effaced in the vagina)
- ★ **Cesarean hysterectomy**: CS is done, followed by removal of the uterus. It is done in uncontrollable PPH, or myomectomy in old patient.
- ★ **Hysterectomy en toto**:
  - Septic abortion
  - Cancer cervix in 1st trimester

#### ◆ **Steps of Abdominal hysterectomy:**

- 1- GEAMR + sterilization + catheterization + drapping
- 2- Cutting & ligation of the round & infundibulopelvic ligament.
- 3- Downward mobilizing of the bladder.
- 4- Cutting & ligation of uterine artery then cardinal ligament.
- 5- Circular incision around the cervix.
- 6- The vagina may be closed or left opened (for free drainage of blood); it may be attached to the ligaments → prophylaxis for prolapse.
- 7- Close the visceral & parietal peritoneum (controversial).
- 8- The catheter may be left if marked bladder dissection is done.
- 9- Prophylactic & postoperative antibiotics.
- 10- Send the specimen for histopathology.

**N.B. The key to avoid bladder & ureteric injury:**

- a. Catheterization.
- b. Downward mobilization of the bladder.
- c. Proper identification of the ureters.

## **2- Vaginal hysterectomy**

#### **A. Advantages over abdominal hysterectomy.**

- i. Absence of abdominal scar.
- ii. Fewer incidences of GIT complications.
- iii. Repair of associated prolapse (cystocele).
- iv. Shorter hospital duration.
- v. Less mortality than abdominal hysterectomy

## **B. Disadvantages:**

### **i. Difficult with:**

1. Pelvic adhesions as in PID.
2. Uterus >12 weeks.
3. Narrow vagina, malignancy

ii. Ovaries & LN are difficult to remove.

iii. More risk of vault prolapse.

## **C. Steps:**

- 1- Circular incision around the cervix.
- 2- Upward mobilization of the bladder.
- 3- Open the peritoneum → uterovesical & Douglas pouch.
- 4- Cutting & ligation of cardinal, uterosacral ligaments then uterine artery.
- 5- Cutting & ligation of tube & ovarian ligament (or infundibulo-pelvic ligament if the ovaries are removed).
- 6- Remove the uterus & vaginal vault is closed or left for drainage.

## **D. indications:**

- Uterine prolapse / inversion
- Any patient with uterine size < 12 w pregnancy (DUB, small fibroid, Adenomyosis).

## **Complications of hysterectomy**

### **- Intraoperative**

- Anesthetic complications
- Primary hemorrhage
- Injury → bladder, ureter, intestine

### **- Postoperative**

- 1st day → reactionary hemorrhage
- 2nd day → abdominal distension
- 3rd day → urine retention, UTI
- 5th day → DVT and pulmonary embolism

### **- Later on**

- ♥ Abdominal wound: infection, burst abdomen, incisional hernia, colloid
- ♥ Vault: vault prolapse, infection, granuloma, dyspareunia
- ♥ Intra-abdominal adhesions → intestinal obstruction
- ♥ Injury of ureter: urinary fistula
- ♥ No ovary: menopausal symptoms
- ♥ No uterus: physiological symptoms (depression)

- **Mortality** → (1/1000): hemorrhage, DVT, septicemia



## Laparoscopic Assisted Vaginal Hysterectomy (LAVH)

- In case of suspected *uterine adhesions*
- Laparoscope is used to free the round, infundibulopelvic, broad ligaments
- Continue the steps vaginally. However, it carries the risks of laparoscopy

## HYSTEROSCOPY

### 🔥 Idea:

- ◆ Visualization of the uterine cavity by a fibro-optic endoscope introduced through the cervix.

### 🔥 Indications:

	<u>Diagnostic</u>	<u>Therapeutic</u>
<u><b>Congenital</b></u>	Septate uterus Patulous internal Os	Resection of a septum
<u><b>Amenorrhea</b></u>	Asherman syndrome	Adhesiolysis
<u><b>Bleeding</b></u>	DUB	Endometrial ablation
<u><b>Contraception</b></u>	Missed IUD	Removal of IUD Sterilization
<u><b>Infertility</b></u>	Suspected uterine factor	IUI, balloon dilatation
<u><b>Neoplasm</b></u>	Polyps, fibroids Exploration of the uterus	Resection (better than D&C)

### 🔥 Contraindications:

- ◆ Amenorrhea of unknown nature or pregnancy
- ◆ Infections e.g. acute salpingitis or acute cervicitis.
- ◆ Moderate to severe bleeding, cancers & menstruation

### 🔥 Technique:

- ◆ **Anesthesia:**
  - Not in diagnostic hysteroscopy (4mm diameter)
  - GEA operative hysteroscopy (10mm diameter)
- ◆ Dilatation of the cervix.
- ◆ Distension medium for proper visualization e.g.
  - Carbon dioxide
  - Glycine
  - Dextrose 5%.

- ◆ The hysteroscope (fibro-optic endoscope of diameter 4 -10 mm) is introduced connected to a light source.

#### 🔥 Types:

- Panoramic: x 1
- Contact: x 20
- Micro hysteroscopy: x 60 – 150

#### 🔥 Complications:

1. Complications of anesthesia
2. Complications of the medium used for distension e.g. fluid overload
3. Complications of dilatation e.g. bleeding, injury as perforation & infection

## LAPAROSCOPY مهم جدا

#### 🔥 Idea:

- Visualization of the peritoneal cavity by endoscope introduced through the abdomen.

#### 🔥 Indications:

	<u>Diagnostic</u>	<u>Therapeutic</u>
<u>Congenital</u>	Differentiates septate from bicornuate uterus	Mullerian agenesis (Vachetti operations)
<u>Amenorrhea</u>	Iry amenorrhea	Ovarian biopsy
<u>Contraception</u>	Missed IUD	Removal of IUD Sterilization
<u>Infertility</u>	Suspected tubal factor Endometriosis PCO Unexplained infertility	Peritubal adhesiolysis Cauterization Ovarian drilling Ovarian pickup in IVF
<u>Neoplasm</u>	Subserous fibroids Adnexal swellings 2 <sup>nd</sup> look laparoscopy	Myomectomy Ovarian cystectomy lymphadenectomy
<u>Pelvic pain:</u>	<b>A- <u>Acute pain:</u></b> to differentiate ectopic pregnancy from acute salpingitis. <b>B- <u>Unexplained chronic pelvic pain</u></b> e.g. endometriosis or pelvic adhesions	<u>LUNA</u>

### ♣ Timing:

- ❖ Postmenstrual: therapeutic (less congestion).
- ❖ Premenstrual: diagnostic better visualization of EO & to take biopsy.
- ❖ At ovulation: ovum pick up.
- ❖ Any time: suspected ectopic pregnancy.

### ♣ Technique:

#### 1-Preparation:

- Position: modified lithotomy, thighs flexed 45°, Trendlenberg, the head of table lowered 15° اهم حاجه
- Anesthesia GEA, Sterilization, catheterization, toweling
- Bimanual examination of the genital tract
- A Cusco is inserted, the cx is grasped by volsellum + a uterine sound is passed to show length & direction of uterus + a uterine cannula (Leash, Cohen, Rubin) is inserted in cervical canal

#### 2-Pneumoperitoneum:

- Veress needle is inserted through a small sub-umbilical incision 1cm in the direction of pelvis
- Abdominal wall can be grasped upwards to displace intestine away
- Insufflation of CO2 into the abdomen about 3-5 liters, pressure should be always < 20mmHg (if > 20 → obst. to flow or extraperitoneal entry)

#### 3-Laparoscopy:

- the Veress needle is withdrawn
- Introduce the trocar & the sheath
- The trocar is withdrawn & introduce the laparoscope through the sheath
- Laparoscope transmits the view through a fiber optic cable to a monitor
- 2<sup>nd</sup> punctures at both iliac fossa are inserted through which assisting instruments are introduced; this helps manipulation of viscera & surgery. Graspers, scissors, diathermy, laser, even surgical knots can be used
- Methylene blue dye is injected through cervical cannula to see tubal patency
- Gas flow is continuous all the time, at the end, air is allowed to escape & laparoscope is removed

### ♣ Contraindication:

#### 1-Risk of visceral injury:

- Large pelviabdominal mass as hepatosplenomegaly, pregnancy >16week
- Paralytic ileus, intestinal obstruction
- Multiple previous laparotomy

#### 2-Generalized peritonitis

**3- When pneumoperitoneum is hazardous e.g**

- Severe heart or chest disease
- Morbid obesity
- Diaphragmatic hernia

### ♣ **Complications:**

**1- Anesthetic complication**

**2- Injury especially during trial of entry**

- Vascular injury (inferior epigastric vessels or pelvic vessels)
- Visceral injury (intestine, colon, bladder ,uterus)
- Thermal injury if diathermy is used

**3- Pneumoperitoneum complication:**

- Gas embolism
- Emphysema of abdominal wall
- Respiratory & cardiac problems due to chest compression
- Metabolic acidosis d.t excess CO<sub>2</sub> absorption

**4- Late complication:**

- Infection of punctures sites & peritonitis
- Omental hernias at puncture sites

## TRACHELORRHAPHY

**1- Emmet's Trachelorrhaphy:**

- ⇒ Done in cases of cervical tears without hypertrophy of the cervix.
- ⇒ The cervix is dilated; the scar is excised followed by suturing the raw area by interrupted sutures.

**2- Bonney's Trachelorrhaphy:**

- ⇒ Done in cases of cervical tears with hypertrophy of the cervix.
- ⇒ A wedge is excised from cervical anterior & posterior lips then the raw area is covered.

## CYSTOSCOPY

### ♣ **Indications:**

**1- Evaluation and staging of malignant diseases**

- a. Bullous edema: early sign of bladder involvement, due to obstruction of the lymph drainage
- b. Ridges & furrows (submucosal involvement)

**2- Evaluation of urinary fistula**

**3- Evaluation of urinary incontinence (polyps or diverticulae)**



## Hysterosalpingography

(Look details in the chapter of infertility)

♣ **Timing:** 4- 7 days postmenstrual

♣ **Method**

- Position → Lithotomy
- Anesthesia → not used (anti-PG can be given ½ hour before)
- Bimanual examination → of the genital tract
- Sterilization → toweling
- A Cusco is inserted, the cervix is grasped by volsellum
- A radio opaque material (Lipidol or Urograffin) is injected (5-10ml) through the cervix (under screen or with out screen), then X-ray is taken.

♣ **Contraindications** as general + sensitivity to iodine

♣ **Indications**

- 1- Infertility (especially if tubal or uterine factor is suspected)
- 2- Assessment of results of surgery after (myomectomy, tuboplasty, salpingectomy, metroplasty, Lysis of intrauterine adhesions)
- 3- Habitual abortion
  - Uterine malformation
  - Intrauterine adhesions → filling defect
  - Patulous internal os (loss of waist of uterus → funnel shaped cervix)
- 4 – Irregular uterine bleeding → polyps, submucous fibroid, adenomyosis
- 5 – Post traumatic amenorrhea → to diagnose Asherman's syndrome
- 6 – In some cases of missed IUD → after exclusion of pregnancy

♣ **Complications**

- collapse or shock
- Ascending infection → salpingitis, PID
- Oil embolism: avoided by (Urograffin + HSG 4-7 days after menses)
- Oil granuloma, Intravasation & Iodine hypersensitivity

## CULDOCENTESIS

♣ **Definition:** Is the passage of a wide bored needle into the cul -de sac through posterior fornix

♣ **Indications** Collection of free material (fluid, blood or pus) in the peritoneum

♣ **Procedure**

- ◇ Position: modified fowler position for about 1/2 h to help accumulation of the fluid in the cul-de-sac. The fluid is then examined microscopically.
- ◇ The fluid may be blood (ruptured ectopic pregnancy) or pus (pelvic abscess) or malignant cells (intraperitoneal malignancy).

## CYTOLOGY

Cytology is the study of cellular characters & morphology of desquamated epithelial cells

### ♣ Site of cytology:

1. Cervicovaginal {sensitivity for Cx (98%), endometrium (80%), tube (20%), ovary (10%)}
2. Endometrium.
3. Buccal.
4. Ascitic or amniotic fluid.

### ♣ Findings:

#### 1- Malignancy:

- ⇒ Hyperchromatosis, increased nuclear cytoplasmic ratio & abnormal mitosis
- ⇒ Cytoplasmic vacuolation & pleomorphism.

#### 2- Evaluation of hormonal status:

- ⇒ Superficial cells are polyhedral, with eosinophilic cytoplasm & pyknotic nucleus.
- ⇒ Intermediate cells: polyhedral, with basophilic cytoplasm & large vesicular nucleus
- ⇒ Parabasal cells are oval, with a basophilic cytoplasm & a large rounded nucleus.
- ⇒ Maturation index: Percentage of the Basal /Intermediate/ superficial cells.
- ⇒ Karyopyknotic index: Percentage of cells with nuclear pyknosis.

## LASER IN GYNECOLOGY

◆ LASER = Light Amplification by Stimulated Emission of Radiation.

### ♣ Types:

- ◆ Carbon dioxide LASER: It is the most commonly used.
- ◆ YAG (Yttrium - Aluminum - Garnet) LASER
- ◆ Argon LASER
- ◆ KTP (potassium, tetanyl phosphate) LASER

### ♣ Indications: treatment of

- ⇒ **Congenital**: excision of uterine septum
- ⇒ **Infections**: Condyloma accuminata, Chronic cervicitis
- ⇒ **Neoplastic**: Vaginal intraepithelial neoplasia (VAIN), CIN.
- ⇒ **Bleeding**: Endometrial ablation,
- ⇒ **Infertility**: **Endometriosis** (Photo-coagulation of implants), salpingectomy, drilling of PCO

### ♣ Advantages:

- ◆ Controlled depth of destruction, so less liable to produce fistulas
- ◆ Rapid healing & minimal scarring.

♣ Disadvantages: expensive & needs special training & precautions to protect the medical staff.

## CRYOSURGERY IN GYNECOLOGY

♣ **Indications:** treatment of chronic cervicitis, Condylomas acuminata & CIN.

♣ **Advantages & procedure & disadvantages:** See chronic cervicitis.

## Endometrial ablation

♣ **Aim:** Destruction of endometrium to control DUB.

♣ **Indications**

- Patient unfit for hysterectomy.
- Marked obesity.
- Severe hypertension.
- Heart failure, uncontrolled DM.
- Refusal of operation.

♣ **Results**

- Amenorrhea ....50%.
- Hypomenorrhea ...40%.
- Failure ....10%.

♣ **Methods:** Under general anesthesia or local paracervical block + sedation.

**1-Thermal ablation:**

- Dilate cx to 10mm
- Rotate a probe slowly for 360 over 20 min
- It destroys the endometrium by heating up to 66°C

**2-Thermal balloon endometrial ablation:**

- A fluid filled balloon is inserted in the uterine cavity
- The fluid is heated to 87°C for 8 minutes
- It destroys the endometrium to a depth of 4-5 mm

**3-Microwave endometrial ablation :**

- A microwave probe is inserted in the uterine cavity
- Heat is generated to 95°C for 2-3 minutes

**4-Laser ablation :**

- YAG laser ....destroys endometrium to a depth of 4-5 mm
- Give 1<sup>st</sup> progestogenic drugs or do it postmenstrual

**5-Cryo-ablation:** the endometrium is frozen to -40°C using CO<sub>2</sub> or NO

**6-Endometrial resection:**

- Resectoscope ...shaves the endometrium using electro-cautery loop.
- The loop cuts to a depth of 3-4 mm

**7-Roller ball electro-coagulation**

- Resectoscope ...coagulates the endometrium using roller ball electrode
- Easier & less risk of perforation than resection

## ENDOSCOPY IN GYNECOLOGY & OBSTETRICS

- **Laparoscopy, hysteroscopy, cystoscopy**
- **Culdoscopy:** It is introduced by Deker 1944 & the operating one by Clayman 1963.

### ♣ **Indications:**

- 1) Investigation of infertile females.
- 2) Diagnosis of endometriosis.
- 3) Diagnosis of ectopic pregnancy.
- 4) Diagnosis of adnexal mass.
- 5) Investigation of obscure pelvic pain.

### ♣ **Disadvantages:**

- 1) Uncomfortable position (knee-chest).
- 2) It is mainly diagnostic.

### ♣ **Contraindications:**

- 1) Inability of the patient to assume the knee-chest position.
- 2) Obliterated Douglas pouch.
- 3) Chronic pelvic inflammatory disease.

### ♣ **Complications:**

- 1) Failure to enter through Douglas pouch.
- 2) Vaginal bleeding during introduction.
- 3) Infection.
- 4) Rectal trauma.
- 5) Emphysema.

### - **Colposcope: stereoscopic binocular microscope**

- **Introduced** by Hinselmann in 1927.
- It **magnifies** the cervix from 6-40 times.
- **Procedure:** no anesthesia
  - Position: lithotomy position
  - The cervix is exposed by a speculum, cleaned of excess mucus & then examined before & after acetic acid 3- 5% painting & Schiller iodine.
  - To be satisfactory the transformation zone & whole lesion must be seen.
- **Indications:**
  - 1) Its ability to differentiate benign from malignant lesions.
  - 2) It pinpoints the part of the cervix from which biopsy must be taken.
  - 3) It evaluates the conditions of abnormal Papanicolaou smear.
  - 4) Follow up of CIN, VIN, VAIN.



- **Normal colposcopic (satisfactory) findings:**
  - Normal squamous epithelium of portiovaginalis → smooth & pink
  - Normal columnar epithelium of endocervix → red papillary surface
  - Normal TZ (all should be seen) → immature metaplastic squamous epithelium
- **The transformation zone is considered abnormal if there is:**
  - 1) White epithelium (Leukoplakia).
  - 2) Mosaic appearance.
  - 3) Punctuation.
  - 4) Abnormal vascular pattern as coma or cork screw shaped.
  - 5) Unstained area by Schiller iodine or acetowhite areas.
- **The colpomicroscopy magnifies 200 times but more difficult to master and takes longer time for examination.**
- **Amnioscope:**
  - **Introduced** by Saling 1962.
  - **Technique:**
    - It is a tapering cylindrical scope with different diameters
    - It is introduced through the cervical canal
  - **Indications:**
    - Inspect the amniotic sac while the membranes are intact and if meconium stained induction of labor may be needed.
    - Obtaining a sample of fetal scalp blood for pH.
- **OTHERS:**
  - 1) **Ophthalmoscope:** For examination of the fundus especially in hypertensive disorders with pregnancy (pre-eclampsia and eclampsia, hypertension and chronic nephritis).
  - 2) **Laryngoscope:** for endotracheal intubation in anesthesia and suction of mucus and aspirated material.
  - 3) **Proctoscopy** for rectal condition.
  - 4) **Urethroscopy:** for diagnosis and evaluation of cause of stress, incontinence.
  - 5) **Fetoscopy (needlescope) for:**
    - Skin biopsy for culture.
    - Fetal blood sampling.
    - Visualization of fetal parts.

# MISCELLANEOUS

# Shock in Obstetrics مهمه

## 🔥 Definition:

- Inadequate tissue perfusion leading to cell dysfunction & tissue hypoxia

## 🔥 Phases:

### ❖ Phase of compensation:

- ⇒ Sympathetic stimulation: Tachycardia & Vasoconstriction.
- ⇒ Redistribution of the circulation to the vital organs e.g. brain.

### ❖ Phase of decompensation (Irreversible shock):

- ⇒ Acidosis, organ failure & tissue damage → thromboplastin → DIC.

## 🔥 Types

### A-Hypovolemic & hemorrhagic shock

#### Causes:

- ❖ In early pregnancy: Abortion, Ectopic pregnancy or vesicular mole.
- ❖ Ante-partum hemorrhage & Postpartum hemorrhage
- ❖ Prolonged labor & Pre-eclampsia

#### • Clinical picture:

- ❖ Vital signs: Hypotension, thready pulse, Subnormal temperature (dehydration fever in hypovolemia) & tachypnea
- ❖ Skin is pale & cold, mental confusion, irritability & Oliguria or anuria

### B. Neurogenic shock

#### • Causes:

1. Disturbed ectopic pregnancy
2. Concealed accidental hemorrhage.
3. Rupture uterus & Acute uterine inversion

Neurogenic	Hemorrhagic
☒ The patient is quite & apathetic	☒ The patient is irritable
☒ No external or internal hemorrhage	☒ External or internal bleeding
☒ Superficial veins are full of blood	☒ Superficial veins are collapsed
☒ Normal or increased pulse pressure	☒ Decreased pulse pressure

### C. Septic Shock

#### • Cause

- ❖ **Severe infection**: septic abortion, puerperal sepsis & chorioamnionitis
- ❖ **Toxins**: antigen antibody reaction & cytokines release → vasodilatation.

- **Clinical picture**

- ❖ ↑ pulse & temperature, ↓ blood pressure & **flushed warm dry skin**
- ❖ In advance "hypodynamic" phase. **Cold cyanotic skin & coma**

- **Investigations (as septic abortion):**

- ❖ **Cultures from cervical discharge & blood at the peak of the fever**

- **Complications**

- ❖ Gm -ve & anaerobes → lipopolysaccharides (endotoxin non specific) **That leads to:**

- ♣ Tissue organ damage
- ♣ Damage of microcirculation
- ♣ Thromboplastin ...DIC in few hours due to:
  - Massive tissue damage
  - Tissue & organ failure
  - Damage of pancreas & release of myocardial inhibitory factor
  - Cardiac inhibition (HF & pulmonary edema)
  - **Damage of microcirculation arterioles & capillaries due to:**
    1. V.D ....decrease PR ...shock
    2. ↑ capillary Permeability → ↓ blood volume & hypovolemic shock
    3. Damage of wall of capillaries to the degree allowing passage of RBC

- **Stages:**

- I- **Warm hypovolemic stage:** patient shocked & feverish (means resistance), prognosis is good
- II- **Cold hypotensive stage:** patient shocked with medullary & hypothalamic failure, prognosis is bad
- III- **Irreversible stage:** fatal

### D. Cardiogenic shock

- ❖ **Due to heart failure**

### E. Other causes

- **Causes**

- ❖ Anaphylactic shock treated by cortisone and antihistaminic.
- ❖ DIC, Pulmonary embolism or amniotic fluid embolism
- ❖ Non-obstetric causes e.g. mesenteric thrombosis – rupture spleen

- **Complications:** Renal failure & Sheehan's syndrome, DIC & Death



## Management

❖ (After correction of shock, the cause must be managed e.g. rupture uterus)

⇒ **General:**

- **Wide bored 2 cannula**
- **Trendlenberg position** to increase the venous return.
- **Warmth & Oxygen inhalation:** To correct hypoxia.

⇒ **Replacement:**

- **Fluids & blood transfusion:** Saline, Ringer & fresh blood monitored by (CVP) "Normally it is 8-12 cm H<sub>2</sub>O"

⇒ **Drugs:**

- **Antibiotics & Corticosteroids** in large dose especially in septic shock.
- **Dopamine and sodium bicarbonate** IV infusion.
- **Morphine 10-15 mg IV**, to relieve irritability.

⇒ **Monitoring.** Vital signs, urine output, CVP, electrolytes & acid-base balance.

### **Post partum shock (Collapse) due to:**

**A. Idiopathic (True) obstetric shock**

**B. Obstetric causes:**

- i. 1ry or 2ry postpartum hemorrhage, inversion of uterus
- ii. Amniotic, fluid embolism & complicated ovarian cyst.

**C. Non - obstetric causes:**

- i. Anesthetic complications, Anaphylactic Shock.
- ii. Coronary thrombosis & pulmonary embolism
- iii. Endocrinal Shock (Addisonian crises, Hypothyroidism, Diabetic coma).

# Amniotic Fluid Embolism

1:30. 000, 50% MMR

## 🔥 Predisposing factors:

- Vigorous labor (induced with overdose of oxytocin).
- Rent in the amnion and chorion, marginal separation of the placenta.
- Lacerations of uterus or cervix.

## 🔥 Pathogenesis: (AF embolism is a misnomer)

- It is due to anaphylactic shock and **NOT** due to massive pulmonary embolism.
- Toxicity of amniotic fluid depends upon the presence of thick meconium.
- Severe pulmonary vascular obstruction causing Corpulmonale with hypoxia and decreased cardiac output.
- DIC bleeding from the genital tract & other sites.

## 🔥 C/P:

- Respiratory & circulatory collapse.
- If the patient does not die immediately, severe hemorrhage will develop from DIC.
- Evident bleeding genital tract or other sites of trauma (D&C).

## 🔥 Diagnosis:

- **It is suspected** when sudden respiratory distress and cardiovascular collapse follows delivery of an infant then rapidly cyanosis, hemorrhage, and coma develop
- **Post-mortem autopsy** showing amniotic fluid debris with fetal squamous – vernix caseosa – mucin – lanugo hair (Diagnostic).
- **Investigations:** ECG, CHEST X ray, Ventilation perfusion scan.

## 🔥 Treatment:

- **Vigorous and prompt treatment is mandatory (In ICU):**
  - Immediate intra-venous cannulation, mechanical ventilation.
  - Blood replacement, close monitoring (systemic and pulmonary pressures – oxygen saturation – UOP – CVP – pulse – temperature).
  - IV fluids, inotropic agents and vaso-pressors for maintaining adequate blood pressure & prompt treatment of infection.
  - Patients with Acute Corpulmonale tolerates poorly any ↓ or ↑ of blood volume.

## Abdominal pain during pregnancy

<u>Uterine wall</u>	Abortion, EP, Preterm labor, fibroid (red degeneration and torsion), Uterine rupture & Uterine torsion.
<u>Placenta</u>	VM, Abruption placenta,
<u>Fetus</u>	Multiple pregnancy & Breech presentation
<u>Liquor amnii</u>	Acute hydramnios.
<u>Fallopian tubes</u>	Ectopic pregnancy & Salpingitis
<u>Ovaries</u>	Ectopic pregnancy, complicated ovarian cyst as torsion
<u>Broad ligaments</u>	Varicocele, hematoma.
<u>Urinary System</u>	Kid: pyelonephritis. Ureters: colic. Bladder: Cystitis.
<u>Digestive system</u>	1. GIT: appendicitis, enteritis, gastritis. 2. Liver: damage in pre-eclampsia, infective hepatitis. 3. Gall bladder: cholecystitis.
<u>Abdominal wall</u>	1. Rectus muscles stretching, pain around the umbilicus & at their attachment with the ribs; as in PG. 2. Rectus muscles laceration with hematoma formation due to sudden cough or strain.
<u>Surgical</u>	Acute appendicitis, cholecystitis & Perforated DU
<u>Medical</u>	D K A, Sickle cell crisis, Acute porphyria

## Surgery during pregnancy

	Ac. appendicitis	Ac. cholecystitis	Ov. Cyst compl.
<b>Inc</b>	Commonest 1/1500	2 <sup>nd</sup> most common	uncommon
<b>PDF</b>	unknown	6F	unknown
<b>C/P</b>	Atypical, difficult diagnosis	Like nonpregnant, easy diagnosis	Unilateral pain + swelling
<b>INV</b>	TLC, US	Bilirubin, amylase, US	US
<b>Compl.</b>	Maternal: Rupture, fetal: abortion, PTL		
<b>TTT</b>	Laparotomy + appendectomy	Medical & if failed → surgery	Look ovarian tr with pregnancy

- **Best time** is at midtrimester
- **Before surgery:** document fetal life ± CTG
- **During pregnancy:** tocolytics, minimal uterine manipulations
- **After surgery:** Antibiotics, Tocolytics, profenid suppositories ± progesterone & Reassess fetal viability



# Breast disorders during puerperium

## Deficient lactation

### 🔥 Causes

1. General weakness.
2. Poor suckling
3. Deficient intake of food & fluids
4. Constitutional underdeveloped of the breast
5. Emotional stresses
6. Destruction of the breast by previous mastitis
7. Hypoprolactinemia as in Sheehan syndrome

### 🔥 TTT

- ❖ Regular feeding: if suckling is weak, evacuate the breast regularly by massage or pump
- ❖ Proper diet & fluid intake.
- ❖ Avoid stress
- ❖ Prolactin preparations

## Suppression of lactation

### 🔥 Indications (Contraindications to breast feeding)

#### - Maternal:

- ⇒ **Breast cancer**
- ⇒ **Infections:**
  - ✓ **Acute HBV** during pregnancy (**although** infants of HBV +ve mothers, received HBIG & vaccine, can be breast fed).
  - ✓ **Hepatitis C & HIV**
- ⇒ **A life-threatening illness** in the mother precludes breast-feeding.
- ⇒ **Women with herpes simplex virus** with active breast lesions.

#### - Fetal:

- ⇒ Cleft palate
- ⇒ Marked cleft lip that interferes with suckling.
- ⇒ marked prematurity (weak suckling)
- ⇒ Galactosemia in the infant & inborn errors of metabolism

#### - Death of baby (either SB or neonatal death).

#### - Patient does not want to lactate or wants to stop

### 🔥 Method:

- **Lisuride** (Dopergin): 0.2 mg tablets 1 X 2 X 14
- **Bromocriptin** (Parlodel): 2.5 mg tablets 1 X 2 X 14
- **Quinagolide** (Norprolac). 1 X 1 X 10



- **Cabergoline** (Dostinex) 1 X 1 X 2
- **Vitamin B6**: 100 mg tablets three times daily for 5 days. Pyridoxine shares in synthesis of dopamine.
- **Tight breast binder** to prevent accumulation of milk, **Diuretics**
- **Old method (not used now)**:
  - ⇒ Contraceptive pills: ↑ DVT and pulmonary embolism.
  - ⇒ EE2: 0.05 mg tablets 3 times daily for 3 days
  - ⇒ Androgens: Methyl testosterone sublingual tablets 5 mg

### Cracked nipples (fissuring)

#### ♣ Complication:

- **Pain**, milk retention → abscess
- **Route of entry** for infecting organisms

#### ♣ Treatment:

1. Use nipple shield during feeding to prevent further injury
2. Panthenol cream during day & compound benzoin tincture at night
3. If these measures fail, relieve the breast till healing with regular emptying by manual compression or by a suction pump.

### Breast engorgement

#### ♣ Etiology:

- It occurs on 3<sup>rd</sup> or 4<sup>th</sup> day after delivery when milk secretion starts
- It is due to obstruction of mammary ducts with coagulated milk or absent milk ejection reflex → distension of alveoli with milk → obstruction of the lymphatics & veins

#### ♣ Symptoms

- **Malaise**, pyrexia (rarely exceeds 38.5 °c & does not last >24 hrs)
- **Breast** becomes enlarged, engorged, painful & tender.

#### ♣ Treatment

1. Support the breast with a tight binder or brassier.
2. Analgesics & cold fomentation to decrease pain & congestion.
3. Regular evacuation of the breast by massage or a pump
4. Oxytocin (to help milk flow) by nasal spray or sublingually at feeding

### Acute mastitis & breast abscess

#### ♣ Causative organisms

- The commonest organisms: **staph aureus**, streptococci
- **Source of infection**: the infant nose or throat
- **Route of infection**: through fissures or abrasions at time of feeding

♣ **Types:**

- **Non epidemic** at early weeks or at weaning
- **Epidemic form** at 2-4 days after delivery.

♣ **Forms of mastitis:**

- If limited to the areola → subareolar abscess
- If spreading along the duct system → parenchymatous mastitis
- If spreading along lymphatics → interstitial mastitis
- If spreading to the areolar tissue under breast → retromammary abscess & rarely: subcutaneous abscess

♣ **Clinical picture:**

- FAHMR
- The breast is enlarged, tender, warm & red
- If any abscess forms ...there is edema of the skin fluctuation
- The axillary LN enlarged & tender

♣ **Treatment:**

❖ **Mastitis** (1, 2, 3 as engorgement )

- 4- Antibiotics after taking a sample of milk for C&S
- 5- Breast feeding from the affected breast is stopped

❖ **Breast abscess**

- 1-Incision and drainage under general anesthesia
- 2-Antibiotics (take a sample of pus for C&S)
- 3-Breast feeding from the affected breast is stopped

**Galactocoele**

- A retention cyst containing milk → may resolve spontaneously or by aspiration.
- Due to obstruction of the lumen of a large mammary duct by inspissated secretion → local fluctuating swelling

**Carcinoma of the lactating breast**

- Rapidly growing ....very malignant ....usually fatal
- Absence of pain differentiates it from an abscess

# Amnioinfusion

## 🔥 Definition:

- ❖ It means “the instillation of sterile normal saline or Ringer's lactate solution into the amniotic sac”.

## 🔥 Indications:

- ❖ ↓ Umbilical cord compression in labor when AFI is markedly reduced (↓ CS): PROM, Severe Oligohydramnios, Post term, IUGR.
- ❖ Presence of thick meconium stained liquor in labor → reduce neonatal morbidity and meconium aspiration syndrome
- ❖ Some cases of severe Oligohydramnios to facilitate ultrasonographic evaluation to rule out congenital malformations

## 🔥 Technique:

- ❖ A plastic bag containing 500 ml, normal saline solution is warmed up at 37°C.
- ❖ Connect the saline solution to a three-way catheter placed between the pressure transducer of the fetal monitor and the intrauterine pressure catheter.
- ❖ Infuse the first 250 ml over 30 minutes.
- ❖ If still necessary infuse the other 250 ml, over another 30 minutes.

## 🔥 Contraindications

- ❖ Fetal anomalies incompatible with life
- ❖ Ante-partum hemorrhage
- ❖ Fetal scalp PH less than 7.2
- ❖ Multiple pregnancy

## 🔥 Complications:

- ❖ Excessive or rapid infusion can ↑ intrauterine pressure → abnormal FHR
- ❖ Introduction of infection leading to amnionitis
- ❖ Placental abruption
- ❖ Cord prolapse.

# Drugs and medication during pregnancy

## ◆ FDA classification of drugs used during pregnancy (1980)

- ❖ **Category A:** no risk proved in human (thyroid hormones, vitamins & minerals)
- ❖ **Category B:** no risk on animals (insulin, penicillins).
- ❖ **Category C:** some risk on animals or unknown risk (isoniazid).
- ❖ **Category D:** some human risk, but benefits may outweigh risk (as diazepam)
- ❖ **Category X:** major teratogens (isotretinoin)

## ◆ Teratogenicity according to time of exposure (cause 2-3% of CFMF):

- ⇒ **0 -18 days** → death or no effect.
- ⇒ **18-80 days** → morphologic or structural defects
- ⇒ **After 80 days** → functional effects.
- ⇒ **Drugs with MW < 250 D** can cross the placenta (most of drugs).
- ⇒ **While drugs > 600D** can't cross as heparin or insulin.
- ❖ **Drug** is considered teratogenic if 5% of offspring had identical defects
- ❖ **The teratogenic period** extends from 4th-10th week (organogenesis), However some organs as brain continue to develop during the 2<sup>nd</sup> & 3<sup>rd</sup> trimester e.g fetal alcohol \$ can occur even if she starts to drink in late pregnancies, in some cases, the effect of drugs appears several years after delivery .

### **2. Aspirin (not teratogenic):**

- ⇒ Low dose aspirin 75 mg daily is used to prevent PE, recurrence of IUGR, to treat habitual abortion due to autoimmune disease as SLE & APS
- ⇒ It is antiprostaglandin .....used as tocolytic for PTL
- ⇒ **Disadvantages:**
  - It ↓ platelet aggregation → prolongs bleeding time (APH, PPH)
  - In new born → neonatal hemorrhage, hyperbilirubinemia → neonatal jaundice (it competes with bilirubin for binding with albumin)

### **3. Anticoagulants:**

- A. Oral anticoagulants as Warfarin cause
  - i. Abortion, IUGR, IUFD, maternal & fetal hemorrhage
  - ii. **Fetal Warfarin \$:** microcephaly, Chondrodysplasia punctata
- B. Heparin (best → Does not cross placenta & not secreted in milk)
  - i. **Maternal complications:** hemorrhage, thrombocytopenia, alopecia, allergic reactions, hypotension.
  - ii. **Osteoporosis** if large doses (>15000IU daily for 6 months)

### **4. Antibiotics :**

- ⇒ Penicillin, ampicillin, amoxicillin, erythromycin, cephalosporin: safe drugs, they are the 1st line of therapy in the 1st trimester of pregnancy



⇒ The following drugs are not teratogenic: antituberculous, metronidazole, acyclovir, antifungal.

⇒ **Sulphonamide avoided in:**

- 3rd trimester (they compete with bilirubin for binding sites on albumin → fetal hyperbilirubinemia → neonatal jaundice)
- Women with G6PD ....red cell hemolysis

⇒ **Tetracyclines :**

- They combine with Ca in bone & teeth→yellow discoloration of teeth, hypoplasia of enamel, delayed growth of bone (this only happens if it is taken >4th month when Ca starts to deposit in bone, thus it is safe in the 1st trimester.
- They are hepatotoxic if given in large dose.

⇒ **Aminoglycosides:** streptomycin, 8th nerve damage & congenital deafness

### 5. Anticonvulsants :

⇒ Phenytoin (Hydantoin): fetal hydantoin S (↓absorption of folate), MR & craniofacial anomalies, prophylaxis 5mg folic acid daily to prevent NTD

- In grand mal epilepsy: the benefits of anticonvulsant treatment outweigh the risks of discontinuation of the drug
- In petit mal epilepsy: no drugs are given as the risks > benefits

### 6. Steroid hormones:

⇒ COC ...not teratogenic

⇒ Progesterone 1st trimester ....enlarged clitoris, fused labia minora.

⇒ Danazole ....produces the same effects

### 7. Immunization during pregnancy :

⇒ Live attenuated virus vaccines :

- MMR...contraindicated during pregnancy (also yellow fever)
- Poliomyelitis ....the 2 types OPV or IPV ....not contraindicated

⇒ Inactivated vaccines ....not contraindicated

Virus	Bacterial
Influenza, rabies, IPV vaccine	Cholera, typhoid, plague, meningococcus

⇒ Toxoid (tetanus, diphtheria): not contraindicated, a toxin that has been treated to destroy its toxicity but still capable of producing antibodies.

⇒ Immunoglobulins : not contraindicated

- Hepatitis A, B, measles, varicella, tetanus, rabies

### ♦ **Drug abuse and pregnancy:**

1. **Alcohol:** abortion, IUFD, IUGR, microcephaly, MR, fetal alcohol S (maxillary hypoplasia, prominent forehead & lower jaw, small palpebral fissures).
2. **Amphetamines/Narcotics:** IUGR, fetal distress, respiratory depression, withdrawal S.
3. **Smoking:** IUGR, preterm labor, peri-natal death & ↓ infant development.
4. **Barbiturates and benzodiazepines:** - depression / withdrawal S.

## ◆ **Management:**

❖ Gradual withdrawal, psychological support, observation of NN withdrawal

### ❖ **Major teratogenic drugs:**

1. Tetracyclines: → affect bone & teeth → yellow or brown discoloration & enamel hypoplasia in deciduous teeth, & ↓ fetal long bone growth.
2. Antimitotics / cytotoxic: → abortion / multiple anomalies
3. Radioactive iodine: → fetal hypothyroidism and goiter
4. Thalidomide: → phocomelia

### ❖ **Drugs which are known or suspected to carry a teratogenic risk**

1. Non-steroidal anti-PG → pulmonary HTN & Oligohydramnios
2. Oral Anticoagulants: abortion, IUFD, IUGR, microcephaly, optic atrophy, Chondrodysplasia punctata
3. Lithium: → cardiac anomalies & Anti-epileptics: → cleft palate, cleft lip
4. Diazepam: → floppy baby & sodium valproate, ONTD, microcephaly, cardiac abn.
5. Antimicrobials:
  - ✓ Aminoglycosides: → ototoxicity.
  - ✓ Chloramphenicol: → grey baby \$ (shock + cardio respiratory collapse)
  - ✓ Penicillins, cephalosporins, erythromycins are the safest.
  - ✓ Anti TB, metronidazole & antifungal are not teratogenic.
6. Anti-thyroid: → goiter and neonatal hyper or hypo-thyroidism
7. Oral hypoglycemic: → macrosomia, neonatal hypoglycemia
8. ACE inhibitors are not allowed → fetal renal failure, cranial & limb anomalies
9. Vitamins A (>15.000 IU daily Isotretinoin) & D in high doses → CFMF, MR
10. Sex hormones: Androgens: may cause masculinization of female fetus.
11. DES & Synthetic progestin virilization + VACTERL

# Infections in obstetrics

## Group B streptococcal (GBS) infection

### ♣ Organism:

- Group B streptococcus or streptococcus agalactiae. It is gram positive and is beta hemolytic on blood agar plates.
- GBS infections are acquired in utero & less commonly during delivery.

### ♣ Clinical picture:

- **Fetal:** GBS produces potent toxins which lead to destruction of pulmonary architectures, myocardial depression, pulmonary HTN & shock.
- **Maternal:**
  1. Asymptomatic
  2. Preterm labor, PROM, Chorioamnionitis
  3. Urinary tract infection: pyelonephritis
  4. Postpartum puerperal sepsis usually showing early onset
  5. Post cesarean endometritis
  6. wound infection

### ♣ Investigations:

- Culture of discharge from lower vagina & anorectal regions in enriched broth medium.

### ♣ Prevention:

- **Intrapartum** administration of antibiotics (Ampicillin 2gm I.V. initial dose at the onset of labor followed by 1gm/4hrs until delivery.
- **Neonates** who were born before 1 h of this prophylaxis are given aqueous procaine penicillin G 5000 units IM in delivery room.

### ♣ Active vaccination

## Human immunodeficiency virus (HIV or AIDS)

### ♣ Organism:

- **HIV-1** is responsible for a great majority of HIV cases; HIV-2 is the cause of a minority of cases present in West Africa.
- Semen and the cervico-vaginal secretions contain the virus.
- **Like** all retro viruses HIV-1 has an RNA genome that replicates by using reverse transcriptase enzyme to produce a proviral DNA molecule. The available antiviral drugs inhibit the polymerase enzyme; there is another target for the drugs which is blocking the fusion of the virus with the cell membrane.
- **HIV** infection is transmitted by 3 modes: sexual intercourse, blood transfusion & vertical transmission from mother to the fetus.

- HIV primarily infects the cells that express a certain surface antigen, CD4 antigen.

♣ **Clinical picture (3 phases: 1ry infection, latent phase and AIDS).**

- **Primary infection:**

- High grade viremia after an average 14 day incubation period
- Self limited FAHM resembling mononucleosis; pharyngitis, generalized LN enlargement, arthralgia, myalgia.

- **Latent phase (10 years):**

- However these patients are seropositive for HIV and may transmit the infection during this phase.

- **AIDS with absolute CD4 lymphocyte count less than 200/dl.**

♣ **Treatment:**

- **An effective vaccine has not yet been developed against HIV.**
- **Antiretroviral** antibiotics, as Zidovudine (ZDV or AZT) orally 300mg twice daily starting from 14weeks gestation (avoided in the first trimester) and continued during labor or elective C.S.
- **C.S.** is done at 38 weeks without amniocentesis. The latter may cause materno-fetal transmission.
- **Treatment** with a combination of 2 or 3 antiretroviral drugs can improve the results and further ↓ vertical transmission
- **The mother** should be advised not to breast feed her baby.
- **Prophylactic** and therapeutic intervention for opportunistic infection should improve survival rate and quality of life

### HIV in obstetrics

- **No characteristic fetal syndrome**, but there is a risk of vertical transmission (15-35%), increased with a higher viral load, lower CD4 count, or clinically advanced disease.

♣ **General antenatal care:**

- **It needs a team** including obstetrician, genitourinary medicine or infectious disease physician and a pediatrician.
- **Baseline** serology for CMV & toxoplasmosis & hepatitis B.
- **Invasive tests** such as amniocentesis should be avoided to reduce the risk of transmission.

♣ **Anti-retrovirals:**

- **Zidovudine** monotherapy from the 2<sup>nd</sup> trimester (oral therapy antenatally, IV during delivery, than oral to the neonate for 6weeks).
- **For women** with relatively advanced disease, triple therapy maybe more appropriate aiming to ↓ viral load and ↑ CD4 count.



- For women conceiving on treatment, this is often continued with Zidovudine added in if not already included.

#### ♣ **Delivery:**

- Elective CS ↓ risk of transmission compared with VD by 50%
- When combined with antiretroviral therapy, the risk is ↓ by 87%.
- This is thought to result from avoidance of micro transfusions of maternal blood during contractions and avoidance of contact of the fetus with maternal secretions or blood.
- Caesarean section should be performed before the onset of labor and rupture of membranes, although if presenting in labor, cesarean section still is shown to be beneficial.

♣ **Breast feeding** better avoided (significantly ↑ risk of transmission)

#### ♣ **Surveillance of infant:**

- Previously, serial ELISA until 18months of age as results could be confused due to passive acquisition of maternal IgG antibody.
- More recently, PCR detection of DNA or RNA of HIV
- Infants who have been exposed to antiretrovirals during pregnancies should be reported to the antiretroviral pregnancy register.

### Syphilis:

#### ♣ **Organism:**

- It is caused by Spirochete *Treponema pallidum*
- It can cross the placenta & fetal infection at any stage of the disease
- **Transmission:** is more common with advancing gestation, especially after the 18-20<sup>th</sup> week

#### ♣ **Clinical picture:**

##### - Maternal:

**The infection occurs in three stages:**

1. **1ry syphilis** is characterized by a painless genital ulcer that may pass unnoticed if on the cervix. It resolves spontaneously in 2-6weeks
2. **2ry syphilis (2-6w)** lymphadenopathy, condyloma lata, maculopapular rash, followed by a latent phase of a variable duration.
3. **If no treatment 1 in 3 patients will proceed to tertiary syphilis** which involves CVS, CNS & musculoskeletal systems.

##### - Fetal:

1. **In pregnant ♀ if untreated 50% will develop congenital syphilis:** stillbirth, hydrops fetalis, hepatosplenoomegaly, lymphadenopathy, jaundice, chorioretinitis & osteochondritis.
2. **Characteristic findings in the neonate:** mulberry molars, saddle nose, interstitial keratitis and eighth-nerve deafness.

### 🔥 Investigations:

- Serological screening & by dark-ground microscopy for spirochetes

### 🔥 Treatment:

- Adequate treatment before 16 w ↓ risk of infecting the fetus.
- It is appropriate to treat the mother in each subsequent pregnancy
- Benzathine penicillin G as a 1 dose IM (2.4million units) for 1ry & 2ry & the same dose for 3 consecutive weeks for latent syphilis

## Rubella

### 🔥 Organism:

- Also known as German measles (RNA retro virus)
- It is acquired by respiratory droplet exposure.

### 🔥 Clinical picture:

- Maternal: rash with arthralgia, fever & suboccipital & post auricular lymphadenopathy.
- Fetal:
  1. Congenital cataract, glaucoma, heart diseases, deafness, microcephaly, mental retardation, purpura, splenomegaly, jaundice, meningioencephalitis and thrombocytopenia.
  2. Later risk of developing diabetes, thyroid problems, precocious puberty and progressive pan encephalitis.

### 🔥 Investigations:

- Serological assessment as latex agglutination, fluorescent immunoassay or enzyme immunoassay.

### 🔥 Immunization:

- All pregnant women should be tested to confirm immunity,
- Rubella vaccine is live attenuated virus (not used in pregnancy).
- Fetal risks are negligible if pregnancy occurred soon after vaccination.

## Hepatitis B

### 🔥 Organism:

- It is a DNA virus that is hepatotropic, incubation period of 2-6months.
- In developed countries the major routes of transmission are through blood and blood products, sexual activity and I.V. drug abuse
- In developing countries vertical transmission at birth is the principal transmission route.

### 🔥 Clinical picture:

- Maternal:
  - 2/3 of HBV infections are asymptomatic, sub-clinical or associated with minimal, influenza like symptoms

- Upper GIT symptoms such as nausea, vomiting, anorexia, right hypochondrium discomfort but no jaundice in almost 1/2 the cases.
- **Fetal:** no congenital syndrome or teratogenesis.

#### 🔥 **Investigations:**

- **HBsAg** is a surface antigen from the viral capsule and signifies infectivity while anti-HBs antibody is a marker of immunological response and cure of the infection.
- **HBeAg** is an antigen from the core of the virus and implies high infectivity with 90% risk of transmission to the fetus. While anti-HBe antibody indicates a partial immune response.

#### 🔥 **Treatment:**

- Symptomatic and supportive to control nausea and vomiting
- Monitor hydration and uterine activity and perform liver function tests as well as counseling, testing and vaccinating the family.

### Toxoplasmosis

#### 🔥 **Organism:**

- Parasite toxoplasma gondii that normally lives within a domestic cat.

#### 🔥 **Clinical picture:**

- **Maternal:**
  - In immunocompetent patients: Asymptomatic, lymphadenopathy or present with a glandular fever-like illness
  - In immunocompromised patients: severe illness with encephalitis.
- **Fetal:** miscarriage, chorioretinitis, microcephaly / hydrocephaly, intracerebral calcifications & mental retardation.

#### 🔥 **Investigations:**

- **Serological testing** should be carried out in cases of clinical suspicion and either a 4 fold rise in IgG titers
- **Isolated** very high IgM by ELISA means acute infection or reinfection.
- **Fetal infection** is confirmed by IgM at amniocentesis & fetal blood sampling.
- **If fetal infection** is confirmed, US is done at 22 w which demonstrates ventricular dilatation & intracranial calcifications.

#### 🔥 **Prevention:**

- Avoid undercooked meat, unpasteurized milk.
- Avoid contact with cats, washing of hands after handling raw meat.

#### 🔥 **Treatment:**

- 3-week of Pyrimethamine, Sulfadiazine & folinic acid alternating with Spiramycin; recommended for rest of pregnancy + FWB

- **Postnatally** it is recommended to continue treatment for a year if toxoplasmosis is suspected.
- **Long-term** follow up is recommended as children asymptomatic at birth may develop problems in the latter years.
- **Future** pregnancies should be delayed until IgG has been cleared, which may take up to 2 years.

## Cytomegalovirus

### 🔥 Organism:

- It is a member of the herpes virus family.
- CMV is transmitted by
  - Sexual intercourse
  - Blood or marrow transfusion
  - Perinatally either transplacentally or by exposure to the virus from the cervix or the birth canal.
  - Breast milk
  - Cross-infection (viral shedding in urine & respiratory secretion)

### 🔥 Clinical picture:

#### - Maternal:

1. Asymptomatic in 95% of the cases.
2. 1<sup>st</sup> infection: may present with FAHM, atypical lymphocytosis, lymphadenopathy & rarely pneumonitis, myocarditis, thrombocytopenia, meningoencephalitis & hepatitis.

#### - Fetal:

1. **Congenital CMV** accounts for 10% of mental retardation in children up to the age of six.
2. **The fetus may present** with microcephaly, hepatospleneomegally, hyperbilirubinemia, thrombocytopenia & IUGR.
3. **5-10% of infected infants**, although asymptomatic at birth, will develop long term sequel as sensorineural deafness, microcephaly, low IQ or seizures.
4. **85% of babies** will have no related problems at birth or thereafter.

### 🔥 Investigations:

- Cultures from urine and excretions
- **The diagnosis of 1<sup>st</sup> infection:** CMV IgM-titers.
- While a recurrent infection may be confirmed by rise in IgG titers.

### 🔥 Treatment:

- **Therapeutic** termination of pregnancy can be an option if fetal malformations are demonstrated.



## Chicken pox / herpes zoster infection

### 🔥 Organism:

- Varicella zoster, DNA virus
- Transmitted through respiratory droplets & close contact,
- 85% of the population are already seropositive for VSIg

### 🔥 Clinical picture:

#### - Maternal:

1. 1<sup>st</sup> infection leads to chicken pox (rash & vesicles) while reactivation of the dormant virus leads to herpes zoster.
2. Pneumonia in up to 10% of infected adults, with 6% mortality risk (the risk is higher in pregnancy).

#### - Fetal:

1. 1<sup>st</sup> VZ in the 1<sup>st</sup> 20 weeks of pregnancy include spontaneous miscarriage in the first trimester
2. Latter, skin scarring in a dermatomal distribution, eye defects, hypoplasia of limbs and neurological abnormalities.
3. Babies with no evidence of clinical VZ infection at birth may develop herpes zoster in childhood consistent with an in utero primary VZ infection.

### 🔥 Prevention:

- Live attenuated vaccine prevents chicken pox in adults.
- VZ Ig is effective in preventing or ↓ severity of infection or congenital syndrome if given within 72 h of contact with a susceptible individual

### 🔥 Treatment:

- If there is any doubt regarding immunity, VZ Ig levels are checked in the routine antenatal tests. If immunity is confirmed no further action.
- If the patient is non-immune & is under 20 w pregnant then VZ Ig should be administered as soon as possible.
- If delivery occurs within 5 days of maternal infection or the mother develops VZ within 2 days of delivery, the high risk of neonatal VZ infection justifies administration of VZ Ig as soon as possible to the neonate + Acyclovir if there is any suggestion of neonatal infection.
- Maternal intake of Acyclovir within 24 hours of development of rash may ↓ duration & severity of the illness but this is not recommended in the 1<sup>st</sup> trimester due to the teratogenic effects of Acyclovir.

## Parvovirus infection

### 🔥 Organism:

- Parvovirus B19, which is a DNA virus.
- Transmission is by respiratory droplet
- The incubation period is 4-14 days.
- **Vertical transmission** in 1/3 of cases of maternal infection.

### 🔥 Clinical picture:

#### - Maternal:

1. Aplastic crisis.
2. A form of chronic arthropathy is also possible to occur.

#### - Fetal:

1. 10% of miscarriage.
2. Hemolytic anemia and hemopoietic arrest; → high output cardiac arrest and non-immune hydrops.
3. If the fetus survives, there is no evidence of a congenital syndrome postnatally.

### 🔥 Investigations:

- IgM antibodies are indicative of acute infection.
- IgG antibodies appear within 10 days and persists for years.

### 🔥 Treatment:

- Supportive & symptomatic treatment, blood transfusion.
- In non-immune hydrops, treatment depends on gestational age & includes: intrauterine transfusion or delivery & postnatal correction of anemia in the newborn.

## Listeriosis

### 🔥 Organism:

- *Listeria monocytogenes*, gm +ve, non-spore forming facultative anaerobe.
- Transmission is by contaminated food & undercooked meat.

### 🔥 Clinical picture:

#### - Maternal:

- Infection is usually in the form of flu like pyrexia illness and is self limiting.

#### - Fetal:

1. Vertical transmission leads to amnionitis with brown staining of amniotic fluid, preterm labor.
2. Late infection in pregnancy → multiorgan morbidity & mortality.

### 🔥 Investigations:

- Vaginal & blood cultures (*L. monocytogenes* can easily be confused with *Diphtheroids*).

### 🔥 Treatment:

- **Infection** is responsive to a wide range of antibiotics as Ampicillin, Chloramphenicol, Co-trimoxazole and aminoglycosides.
- **Treatment** should continue for 3-6 weeks to prevent relapse.

## Herpes simplex infection

### 🔥 Organism:

- Herpes simplex virus (HSV) is a DNA virus.
- **Genital herpes** is usually acquired through sexual contact with an infected individual, or by orogenital contact
- **The incubation period** is about a week.
- **HSV1** is predominantly responsible for orolabial lesions, while HSV2 is responsible for genital lesions, but there is considerable overlap between the two types.

### 🔥 Clinical picture:

#### - Maternal:

1. **1ry genital herpes** ± FAHM, myalgia, autonomic neuropathy → hospitalization, bladder atony, urinary retention.
2. **Miscarriage or preterm labor**
3. **The relative immunosuppression** in pregnancy may result in generalized viral dissemination.

#### - Fetal:

1. Neonatal HSV in the 1<sup>st</sup> two weeks of life, being limited to eyes & mouth in 25% but multiple organ affection occurs in 75%.
2. C/P: weight loss, poor feeding & fever with multiorgan involvement carrying a high mortality of 70-80% & long term morbidity including mental retardation and developmental delay.

🔥 Investigations: Tissue cultures with a fluorescent antibody test.

### 🔥 Treatment:

1. In 1<sup>st</sup> & 2<sup>nd</sup> trimesters: symptomatic support with oral or intravenous acyclovir if the mother's condition allows it.
2. The risk of vertical transmission is around 40-50% & viral shedding may continue for 3-6 weeks.
3. Delivery by CS is recommended if the 1ry attack is within 6 weeks of labor, provided no ROM for more than 4 hours.

## Human papilloma virus infection (HPV)

### 🔥 Organism:

- It is a double stranded DNA virus (over 100 subtypes identified)
- It is the most common sexually transmitted infection.

### 🔥 Clinical picture:

#### - Maternal:

1. Condyloma accuminata, CIN, VIN, VaIN & cancers.
2. Genital warts grow rapidly in pregnancy → obstruction in labor.

#### - Fetal:

- Juvenile laryngeal papillomatosis (causes from hoarseness of voice to complete obstruction of upper airways)

🔥 Investigations: Cervical screening smears & colposcopy

### 🔥 Treatment of genital warts:

1. Excision or destruction of visible lesions by physical, pharmacological or surgical methods. Recurrence rate is high.
2. During pregnancy: application of 80% trichloroacetic acid repeated weekly & liquid nitrogen cryotherapy as 1<sup>st</sup> line of treatments.
3. In refractory cases or multiple or extensive lesions, treatment under a general anesthetic with laser or diathermy destruction of warts.
4. Excision of the lesion at the time of delivery is not recommended as it shrinks following pregnancy & may be very vascular → hemorrhage.

## Chlamydia trachomatis

### 🔥 Organism:

- This obligate intracellular organism is responsible for one of the most common sexually transmitted infections in the world.

### 🔥 Clinical picture:

#### - Maternal:

1. Subtypes D and K are responsible for genital infections while others lead to blindness and lymphogranuloma inguinale.
2. C/P: mucopurulent cervicitis, endometritis, acute salpingitis & acute urethral syndrome, preterm labor, PROM
3. The long-term consequences of chlamydial PID may include sub-fertility, adhesions, pain and ectopic pregnancies.

- Fetal: Inclusion conjunctivitis, low birth weight & pneumonia.

### 🔥 Investigations: Cultures, PCR detection of DNA or ELISA techniques.

### 🔥 Treatment:

- In pregnancy: Erythromycin 500mg every 6hours for 1week.
- In the non-pregnant adult a single dose of 1gm Azithromycin.
- In Erythromycin intolerance: Amoxicillin or Clindamycin.

## Gonorrhea

### 🔥 Organism: Neisseria gonorrhea a gram negative diplococcus.

### 🔥 Clinical picture:

#### - Maternal:

1. Acute cervicitis, urethritis, Bartholinitis, proctitis, pharyngitis & disseminated systemic infection.
2. In pregnancy: rash, FAHM & septic arthritis. The most common presentation is asymptomatic infection of the cervix.

#### - Fetal (No intrauterine syndromes)

- Ophthalmia neonatorum.



### 🔥 Investigations

- **Film & gram staining:** gram-ve diplococcic with leucocytosis
- **Culture:** Thayer Martin or chocolate agar.

### 🔥 Treatment:

- **Uncomplicated cases:** a single dose of ciprofloxacin (not in pregnant)
- **In pregnancy:**
  - Spectinomycin 2gm I.M. or
  - Probenecid 1g per os + procaine penicillin G 4.8million units I.M. or Amoxicillin 3g orally then 7-days erythromycin 500mg/6h
- **For disseminated infections,** hospital admission & IV cephalosporins
- **There is no contraindication** of breast feeding.

## Bacterial vaginosis

### 🔥 Organism:

- **Present** in about 20% of pregnant ♀, there is overgrowth of facultative & anaerobic bacteria that normally commensals in the vagina.
- C/P: asymptomatic & fishy odor discharge.

🔥 **Compl:** preterm labor, chorioamnionitis and post partum endometritis.

🔥 **Diagnosis:** as non pregnant (look infections)

🔥 **Treatment:** Metronidazole, Clindamycin 300mg/12h is an alternative.

## Candidiasis

### 🔥 Organism:

- Variety of species of Candida but 90% due to C. albicans.
- Candidas are saprophytic fungi and are commensals in the vagina.
- Risk factors: altered vaginal microflora in pregnancy, ↓ cellular immunity & ↑ glycogen availability.

🔥 **Clinical picture:** pruritis & characteristic discharge.

🔥 **Diagnosis:** as non pregnant

🔥 **Treatment:**

- Antifungal imidazoles such as Clotrimazole, Miconazole, etc.
- Topical imidazoles aren't absorbed & are safe in pregnancy.

# Ultrasonic in obstetric and gynecology

## In obstetrics

- a) Early diagnosis of pregnancy. It appears as a pregnancy ring (dense intrauterine circular echo) as early as 5<sup>th</sup> week after the L.M.P.
- b) Pregnancy growth and follow up by serial scans.
  - At 10 w, fetal structures appear in the gestational sac.
  - At 12 w, it completely fills the uterus.
  - In threatened abortion the pregnancy loss. Is likely if:
    - The borders of the gestational sac are irregular.
    - Ill defined sac, low in the cavity.
    - The cervix is dilated.
- c) Estimation of the fetal presentation, weight and maturity.
- d) Serial measurements of BPD & anteroposterior diameter of the chest.
- e) Multiple pregnancy diagnosis.
- f) Placental localization. The normal placenta appears as semilunar structure in the form of multiple irregular echoes along the uterine wall limited internally by the chorionic plate (irregular linear echo).
- g) Fetal abnormalities as anencephaly; hydrocephalous; meningomyelocele and Omphalocele.
- h) Diagnosis of I.U.F.D by identification of change in the head and the chest. Also failure to elicit the F.H.S by Doppler technique.
- i) Hydatidiform mole diagnosis:
  - No fetal structures.
  - Sunburst type of echo arrangement filling the uterine cavity.

## In gynecology

1. Detection of uterine abnormalities and adnexal mass.
2. Differentiate free form encysted fluid.
3. In malignant tumors.
  - a) Aids in diagnosis.
  - b) In radiation therapy planning.
  - c) In diagnosis of metastasis in the brain or lung.
  - d) To follow up after therapy.
4. In induction of ovulation, to measure follicle growth and maturation before HCG injection.

# Thromboembolic Diseases with Pregnancy

## ◆ Predisposing factors:

- **Mother:** increased age & parity, obesity, blood group other than O.
- **Delivery:** operative delivery more risky than vaginal delivery.
- **Previous thromboembolism:** recurrence risk is 15%.
- **Thrombophilia:** recurrent TED & Factor V Leiden mutations, ↓antithrombin III, ↓Protein C&S, Antiphospholipid syndrome.
- **Virchow triad:** prolonged immobilization, congestive heart failure, dehydration, sickle cell disease.
- **Forms:** superficial thrombophlebitis, DVT, PE, ovarian vein thrombosis & septic pelvic thrombophlebitis.

## ◆ Incidence

- ❖ 0.5-1% incidence is equal in both ante- & post partum periods.
- ❖ It is the 1<sup>st</sup> most common cause of MMR in UK & 3<sup>rd</sup> most common cause of MMR in developing countries.
- ♣ Untreated DVT: PE in 24% of cases with MMR 15%
- ♣ Treated DVT: PE in 4.5% of cases with MMR < 1%

## ◆ Diagnosis:

### ⇒ Symptoms:

#### ♣ **DVT:**

- Acute painful swollen leg (more common in left LL this may be due to compression of left iliac vein by the right iliac & ovarian arteries that cross the vein on the left side only).
- More common in iliofemoral (more dangerous > calf as it is more commonly leads to PE).

#### ♣ **PE:**

- Sudden severe chest pain, dyspnea, cyanosis.
- Minor PE: less specific symptoms as fever, syncope, cough or pleuritic pain (which should not be diagnosed as pleurisy without the exclusion of PE).

### ⇒ Signs (false +ve in 30% when assessed by venography).

- ♣ Homan's sign (painful dorsiflexion of the ankle).
- ♣ Tender hard cord-like may be palpable.

## ◆ Investigation:

- ⇒ **DVT:** Doppler & colored Doppler. They are slightly less accurate in pelvic DVT (MRI is better).
- ⇒ Venography still has better results in calf DVT (of choice).

- ⇒ US has replaced venography for the diagnosis of DVT, especially for popliteal & ilio-femoral thrombosis. US cannot be used to diagnose DVT with accuracy above inguinal ligament or in the calf.
- ⇒ If PE is obvious: no need for chest Xray, ECG, blood gases & start immediate therapy (to confirm PE >> perfusion V/Q scan, CT, MRI)

### ♠ Management:

#### **I-Prepregnancy counseling: for previous TED**

- ⇒ Thrombophilia screen (d.t recurrence & fetal affection )
- ⇒ Prophylactic anti-coagulant: Aspirin if DVT had not occurred in the previous delivery, Otherwise Heparin/Oral anticoagulant are used

#### **II-Active**

	<b>Heparin</b>	<b>Oral anticoagulants</b>
<b>Mechanism</b>	Activates ATIII ....decrease II & 9-12	Vit K antagonist: ↓2,7-10
<b>Curative</b>	40.000u/day IV, for 10days	Warfarin is the most widely used esp. if heparin fails + 4-6 wks postpartum after having VTE in pregnancy
<b>Control</b>	Double APTT or heparin level (anti Xa) at 0.8 units /ml	
<b>Maintenance &amp; Prophylaxis</b>	10.000 units SC, twice daily	
<b>Control</b>	Normal APTT or heparin level (anti-Xa) at 0.2 units/ml	PT is kept 2.5-3 (INR)
<b>Adv</b>	Don't cross placenta & 1 <sup>st</sup> choice in PE	Little secretion in milk
<b>Compl</b>	-Hemorrhage (in short term ttt) -Thrombocytopenia (by platelet aggregation in the 1 <sup>st</sup> days of ttt or, interaction between platelets, heparin & IgG antibody after the 1st week) -Osteoporosis (if used >3 month)	-Embryopathy -Chondrodysplasia punctuate -Fetal hemorrhage: ICH -APH
<b>Contraind</b>	-Active bleeding, active ulcer -CNS aneurysm, Uncontrolled hypertension, pericarditis, subacute bacterial endocarditis.	Not used in the 1 <sup>st</sup> trimester as it crosses the placenta (fetal warfarin \$)

#### **III-Low molecular weight heparin (LMWH)**

- Fractionated heparin e.g Enoxaparin (clexane), Dalteparin (fragmin).
- Dose: 1mg/kg/12hrs (prophylaxis=30-40mg/12 hrs).
- Follow up: anti-Xa (not PTT).



	Fractionated heparin	Unfractionated heparin
Mode of action ATIII	Mainly X	Mainly II
Molecular weight (KD)	4.000-6.500	5.000-30.000
Bioavailability	90%	30%
Half life	4hrs (SC or IV)	3hrs (SC) ,1hr (IV)
Side effects (hemorrhage, thrombocytopenia, osteoporosis)	All are less with LMWH The main disadvantage is their high	

#### ⇒ **Advantages of LMWH:**

1. 92% availability compared to 30% of unfractionated heparin.
2. Longer 1/2 life (4h when given IV or SC) compared to unfractionated heparin (1 h when given IV & 3 h when given SC).
3. Lower rate of bleeding, thrombocytopenia & osteopenia.
4. The anticoagulant response is more predictable.
5. Routine laboratory measures as activated PTT are not required.

#### **Treatment failure (despite adequate coagulation)**

1. **DVT:** worsening of symptoms despite anticoagulation as caused by obstruction to venous flow from the pregnant uterus particularly with a multiple pregnancy or a large fetus.
2. **PE:** patients may develop recurrent PE despite coagulation. Management is by placing a filter in the IVC.
3. **Septic thrombophlebitis:** this is a rare association with pulmonary embolism. The patient presents with PE which is recurrent inspite adequate treatment. The source is usually the pelvic veins. There may be signs to suggest sepsis, such as high fever and secondary bronchopneumonia. Management is by antibiotics & anticoagulation.

#### ♣ **Complication:**

##### ⇒ **Maternal :**

- ♣ Pulmonary embolism.
- ♣ MMR = 13%, **but** if recovery occurred is usually complete.
- ♣ DVT: postphlebotic \$: valve destruction, edema & skin ulceration.
- ♣ Complications of treatment.

##### ⇒ **Fetal:**

- ♣ Antiphospholipid syndrome may lead to habitual abortion.
- ♣ Complications of treatment.

## Deep venous thrombosis

- ❖ May be silent or lead to fever, painful calves and thigh along with tenderness, swelling and edema of the calves or thigh.
- ❖ May lead to pulmonary embolism.

### 🔥 Investigations

- ❖ Doppler, Ascending phlebography, Isotope venography (better avoided in pregnancy) & Thermography.

### 🔥 Management

- ❖ Analgesics, Elastic stockings & Anticoagulants.

## Pulmonary embolism

### 🔥 C/P:

- ❖ Dyspnea, cyanosis, chest pain, cough and hemoptysis or death.

### 🔥 Investigations

- ❖ ECG, Chest X-ray, Isotope scanning, blood gases & Pulmonary angiography.

### 🔥 Treatment:

- ❖ Oxygen, morphine, digoxin, aminophyllin & anticoagulants (IV or infusion 1000-2000 unit/h according to APTT (2-3x the normal) continue till 1 week after the clinical symptoms disappear then continue on prophylaxis 5000-10000 SC/12 hr till 6 weeks after delivery).
- ❖ Sometimes surgical removal of the embolus or IVC sieve.



## Protocols for thromboprophylaxis

Groups	Management
<b>I: ♀ with previous VTE and no thrombophilia</b>	<ul style="list-style-type: none"> <li>■ Antepartum:                             <ul style="list-style-type: none"> <li>• Controversial if single episode</li> <li>• Antenatal LMWH is advised in:                                     <ul style="list-style-type: none"> <li>- Previous recurrent VTE or VTE in an usual site.</li> <li>- Previous VTE &amp; +ve family history.</li> <li>- Previous estrogen-related VTE (pregnancy or OCPs).</li> </ul> </li> </ul> </li> <li>■ Postpartum: LMWH for six weeks.</li> </ul>
<b>II: previous VTE &amp; inherited thrombophilia.</b>	<ul style="list-style-type: none"> <li>- Antenatal LMWH &amp; for six weeks postpartum.</li> <li>- Certain types of thrombophilia, higher prophylactic doses, or even therapeutic anticoagulation for life.</li> </ul>
<b>III: inherited Thrombophilia &amp; no previous VTE.</b>	<ul style="list-style-type: none"> <li>- Antenatal: no LMWH except in ↓Antithrombin, Protein C &amp; S.</li> <li>- LMWH or warfarin for six weeks postpartum.</li> </ul>
<b>IV: Women with acquired thrombophilia.</b>	<ul style="list-style-type: none"> <li>- Antenatal LMWH &amp; for six weeks postpartum.</li> <li>- Low-dose aspirin (± LMWH) ↑ pregnancy outcomes in APAS.</li> <li>- APAS + no history of VTE:                             <ul style="list-style-type: none"> <li>• Antenatal: no LMWH.</li> <li>• Postpartum: LMWH for 3 to 5 days</li> </ul> </li> <li>- +ve antiphospholipid antibodies + no previous VTE + no previous 'APAS-classifiable pregnancy loss: no prophylaxis.</li> </ul>
<b>V: without thrombophilia and no previous VTE.</b>	<ul style="list-style-type: none"> <li>- ≥ 3 current or pre-existing RF (other than previous VTE or thrombophilia): antenatal LMWH &amp; for 3-5 days postpartum.</li> <li>- 2 current or pre-existing RF (other than previous VTE or thrombophilia): LMWH for 3-5 days postpartum.</li> <li>- There are cases where 1 or 2 risk factors alone are sufficient to justify antenatal LMWH (e.g. an extremely obese ♀).</li> </ul>

## Other hepatic disorders

(Chiefly occur in 3rd trimester)

### 1-Intrahepatic cholestasis of pregnancy

- ♣ **Incidence**: the most common liver disorder unique to pregnancy
- ♣ **C/P**: mild jaundice, pruritis + increase bile salts are diagnostic
- ♣ **Complications**: preterm labor & IUFD
- ♣ **D.D**: Viral hepatitis (no fever, abdominal pain, N&V) chronic cholecystitis
- ♣ **Investigation**: increased alkaline phosphatase, direct bilirubin, SGOT & SGPT, prolonged prothrombin time
- ♣ **Treatment**:
  - ♣ **Mother**: Cholestyramine 4gm 1x4 +/- phenobarbitone for pruritis, vit K 10 mg to improve the PT, corticosteroids may help
  - ♣ **Fetus**: TOP once maturity could be documented.
  - ♣ marked improvement within 2days
- ♣ **Prognosis**: avoid use of COC to avoid recurrence 70%

### 2-Acute fatty liver of pregnancy

- ♣ **Incidence** :1/10.000
- ♣ **C/P**: symptoms like viral hepatitis {fever, headache, N&V, jaundice, pruritis, upper abdominal pain. Then symptoms similar to PET then acute LCF
- ♣ **Complication**: high MMR, PNMR
- ♣ **Treatment**: TOP + liver support

### 3-Chronic liver disease

- ♣ **Chronic active hepatitis** :
  - ♣ **Complication**: high PNMR, PTL, PET
  - ♣ **Treatment**: corticosteroids +/- azathioprine is continued in pregnancy
- ♣ **Liver cirrhosis** :
  - ♣ usually they are infertile
  - ♣ **Complication**: high PNMR + rupture esophageal varices.



# Renal disorders during pregnancy

## I. Asymptomatic silent Bacteruria (4-7%)

### 🔥 Definition

- ♣ Presence of > 100,000 organisms of a single bacterial species/ml of midstream freshly voided urine in absence of symptoms.

### 🔥 Organism:

- ♣ 80% E. coli, 20% Staph. aureus, Proteus, Pseudomonas

### 🔥 Complications

- ♣ Acute pyelonephritis (30%), anemia, ↑PE, preterm labor, PROM

### 🔥 Diagnosis:

- ♣ No symptoms so screening test must be done in 1<sup>st</sup> visit (Mid stream colony count, culture & sensitivity, nitrate test)
- ♣ **nitrate test**: nitrate are formed by the action of bacteria in urine, body does not form nitrates, **disadvantages**: good +ve but bad -ve (many organisms do not form nitrates)
- ♣ **Triphenyl tetrazolium chloride test.**

### 🔥 Treatment (for 7-10 days):

- ♣ Broad spectrum antibiotics of high urinary concentration for 7-10 days as nitrofurantoin, Ampicillin or according to C&S if TTT fails.
- ♣ Urine C&S is then repeated each trimester
- ♣ In relapses: 1 dose of cephalexin 500mg daily throughout pregnancy.

## II. Acute pyelonephritis 1%

### 🔥 Definition

- ♣ Acute Suppurative inflammation of the renal pelvis ± calyces

### 🔥 Etiology

- ♣ 90% E.Coli (commonly it is not mixed infection)
- ♣ Others: Gm+ve staph, strept, Gm-ve klebsiella, proteus or mixed.
- ♣ Route of infection: Usually ascending, blood born or via lymphatic

### 🔥 Predisposing factors

- ♣ Ureteric dilatation (P effect) & compression (more on the Right side).
- ♣ Short urethra
- ♣ Asymptomatic bacteria.
- ♣ Catheterization (urinary tract is virgin until catheterized)

### 🔥 Clinical picture

#### ❖ Symptoms:

- ⇒ **General**: FAHMR +vomiting (sudden onset)
- ⇒ **Local**: severe loin pain, dysuria, hematuria /pyuria, frequency

❖ **Signs:**

- ⇒ **General:** high fever, tachycardia
- ⇒ **Local:** tenderness & rigidity in loins

♣ **Investigations**

- ♣ As asymptomatic bacteruria + RFT (to exclude impairment)
- ♣ Urine analysis: pus cells, RBCs, acidic with fishy odor in E-coli, urine C&S esp in recurrent cases
- ♣ CBC & blood culture at the time of rigors.
- ♣ Post partum IVP
- ♣ U/S for stones urinary tract malformations

♣ **Complications**

- ♣ ARF or Chronicity
- ♣ Spreads of infection peri-nephric abscess & up to SEPTIC SHOCK.
- ♣ Precipitates abortion, premature labor, IUFD, PROM
- ♣ Recurrence in next pregnancy 20 %

♣ **Recurrence:** 20% in next pregnancy

♣ **Treatment (At least for 2 weeks)**

- ❖ **In Hospital** (I.V fluid & AB)
- ❖ **General lines** BDCANFANAN
- ❖ **Antibiotics:** According to C&S but Start with broad spectrum AB:
  - ♣ **Ampicillin 500mg 1x4 or**
  - ♣ **Cephalosporine 500mg 1x4 or**
  - ♣ **Nitrofurantoin 100mg 1x4**
    - Cure is complete after 3 -ve successive cultures.
    - If no response within 72 hrs repeat C&S
    - In resistant cases → postpartum IVP, U/S for stones, congenital anomalies (esp if with hematuria or HTN)
- ❖ **Surgery**
  - ♣ **If ureteric obstruction** → ureteric catheter (Pig-tail)
  - ♣ **If failed** → nephrostomy
- ❖ **TOP:** if TTT failed to control the condition.

**III. Acute renal failure (1/2000-10.000)**

♣ **Definition**

- ♣ Decrease in renal functions abruptly with decrease U.O.P less than 400ml/24hrs or 20ml/hr

♣ **Etiology**

- ❖ **Prerenal causes:** renal hypoperfusion (Shock, PET, hyperemesis gr.)
- ❖ **Renal causes:** Glomerulonephritis & Acute pyelonephritis
- ❖ **Post-renal causes:** ureters or urethra are obstructed by stones.

### 🔥 Pathology

- ♣ **Acute tubular** (reversible) necrosis then
- ♣ **Acute cortical** (irreversible) Necrosis

### 🔥 Clinical picture: Cause + Stages of ARF

- **Oliguric phase**
- **Diuretic phase:** inability to concentrate urine 1010, drowsy patient, acidotic respiration

### 🔥 Investigation

- ♣ Urine analysis
- ♣ Renal function Test.
- ♣ Serum electrolytes: Na, HCO<sub>3</sub> decrease while K level rises.

### 🔥 Treatment

- ❖ **Prophylactic:** Avoid the causes
- ❖ **Active:** Correction of the cause +
  - ♣ **Oliguric phase:** Maintain fluid & electrolyte balance & TTT of hyperkalemia & ↓proteins.
  - ♣ **Diuretic phase:** fluid & electrolyte replacement.

## IV. Chronic glomerulonephritis (5%)

🔥 **Etiology:** Acute GN or chronic pyelonephritis

🔥 **History:** Any age, any parity, HTN & edema

### 🔥 Investigation

- ♣ Creatinine
- ♣ Fundus: albuminuric retinopathy & hemorrhages

### 🔥 Management

- ♣ **Terminate** if creatinine clearance < 65 ml/min + **sterilization**

### **N.B 1: Indications of dialysis in RF:**

- $K > 7 \text{ mg/L}$ ,
- $\text{BUN} > 100 \text{ mg\%}$ ,
- $\text{Cr.} > 10 \text{ mg}$
- $\text{HCO}_3 < 10 \text{ mg/L}$  &  $\text{Na} < 130 \text{ mg/L}$

### **N.B 2: Kidney function test:**

- Creatinine (0.4-1.4 mg/dl),
- Urea (20-40 mg/dl)
- Creatinine clearance (120ml/min in non pregnant  $\uparrow$  50% in pregnancy)

### **Pregnancy in women on dialysis (1/200)**

- Manage as non pregnant (dialysis + control hypertension), tests of fetal wellbeing (start at 28 w). Treat anemia by transfusions or EPO
- Preterm labor in fetal distress, abruptio placenta, maternal bleeding.

### **Pregnancy in renal transplant patient (1/50)**

- **Criteria:**
  - Stable renal function
  - Minimal or well-controlled hypertension & proteinuria
  - Treatment is stable with  $\leq 15 \text{ mg/kg/day}$  prednisone,  $\leq 2 \text{ mg/kg/day}$  azathioprine or  $\leq 5 \text{ mg/kg/day}$  cyclosporine.
  - Good general health for at least two years following transplantation
- **Complications:** Renal failure, rejection, superimposed pre-eclampsia
- **TOP** is recommended if renal functional deterioration

## **Anemia with pregnancy**

### **Definition**

- ♣ It is  $\text{Hb} < 10.5 \text{ g\%}$  in pregnancy.
- ♣ During pregnancy blood volume increases by a mean of 40 %, the red cell mass increase 20%  $\rightarrow$  physiological decrease in H.V.

### **Classification**

#### **I. Dyshemopoietic**

- ♣ Iron deficiency anemia
- ♣ Megaloblastic anemia as Folic acid deficiency (common), vit B12 deficiency (rare).

#### **II. Aplastic**

- ♣ Bone marrow failure by infections (viruses), drugs (chloramphenicol), malignancy (leukemia).



### III. Hemolytic:

#### ♠ Intracapsular

⇒ Hb: hemoglobinopathies, enzyme as G6PD.

⇒ Membrane: spherocytosis

#### ♠ Extracapsular as infection, drugs, hypersplenism

### IV. Hemorrhagic

#### ♠ Acute (APH, PPH)

#### ♠ Chronic as piles.

### V. Or according to the size

• Microcytic (MCV <80fl): iron deficiency anemia, thalassemia

• Normocytic (MCV 80-100 fl): sickle cell anemia

• Macrocytic (MCV >100fl): vit B12, folate deficiency.

### ♠ Complication

#### • Effect of pregnancy on anemia

- It becomes aggravated due to increase Fe & vit demand

#### • Effect of anemia on pregnancy.

- **Maternal:** abortion, preterm labor, APH, PPH, inertia & sub-involution, defective lactation..

- **Fetal:** IUFD, IUGR. In Fe deficiency anemia the fetus is rare to be affected as Fe is transported actively to the fetus, However, there may be PTL, RDS, increase PNMR due to maternal complication.

### Iron deficiency anemia

♣ This is the most common type of anemia & is the commonest pregnancy disorder

♣ "WHO recommended 30 – 60 mg/d for pregnancy with adequate Fe stores & 120 – 240 mg/d for pregnancy with inadequate Fe store"

♣ Daily absorption is 10% of supplied iron, 20% in pregnancy

♠ Non-pregnant → 1-2mg.

♠ Early pregnancy → 2-5m.

♠ Late pregnancy → 5-6mg.

### ♠ Causes of iron deficiency anemia:

♣ Increased demand: e.g. in pregnancy.

♣ Decreased intake: e.g. diet deficiency, vomiting

♣ Increased loss: e.g. parasitic infestations, piles.

### ♠ Clinical picture:

♣ Symptoms & signs: Angular stomatitis, Red glazed tongue, brittle nails, splenomegaly, headache, fatigue.

## ◆ Investigations

- ♣ To diagnose anemia: Hb% < 11 gm%
- ♣ To diagnose iron deficiency:
  - ♠ Blood picture → Hypo chromic microcytic anemia.
  - ♠ Serum iron: ↓ (N = 60-180 µg/dl)
  - ♠ ↓ Serum ferritin: (reflects BM stores) < 10ng/ml (1<sup>st</sup> abnormal test)
  - ♠ ↑ Iron binding capacity (N 400/gm %)
  - ♠ ↓ Transferritin saturation (normal 30% & < 15% = anemia)
  - ♠ Assessment of iron stores: Bone marrow biopsy stained for iron content.
  - ♠ Plasma ferritin level
  - ♠ Stool analysis for occult blood & parasitic infestations

## ◆ Treatment

- ♣ Prophylactic: Iron supplementation → oral preparations (30 – 60 mg/day) & eradicate any predisposing factors.
- ♣ Forms: Fe<sup>++</sup> fumarate, Fe<sup>++</sup> gluconate, Fe<sup>++</sup> sulfate.
- ♣ Active treatment:
  - ♠ Oral iron therapy: 120-240 mg/d (0.3-1 gm/wk) + Folic acid [masked folate deficiency].
  - ♠ Parental iron:
    - No response/intolerance to oral TTT (nausea, vomiting, diarrhea).
    - Disadv: SC → allergy/IM → painful & sterile abscess/IV → thrombophlebitis.
  - ♠ If failed or severe anemia → Transfusion of packed RBCs.

### Iron metabolism

- Requirements: in male 1mg/day, in female 2mg/day due to menses
- In pregnancy, total requirements 1000mg (500 mother, 500 fetus) = 3.7 mg/day
- Daily requirements: 1mg (in pregnancy there is no menses) + 3.7 mg = 4.7mg
- Needs: low in beginning in pregnancy & then ↑ so, there is range 3-6 mg/d
- Absorption 10%, 20% in pregnancy so intake should be 30-50mg/d
- It is difficult so the mother uses stored iron if the stores are already depleted or anemia is already present & iron deficiency anemia becomes aggravated

### Megaloblastic anemia

#### I-Folic acid deficiency

## ◆ Etiology

- ♣ Folic acid deficiency: ↓ intake or absorption, ↑ requirements
- ♣ Vit. B 12 deficiency: atrophic gastritis
- ♣ "WHO recommended 800 µg/d for pregnancy & 600 µg/d for lactation"

♣ **Clinical features:** Pallor, pica, fatigue

♣ **Investigations**

- ♣ Hb% < 11 gm% + macrocytic normochromic anemia, MCV > 100 fl
- ♣ Megalocytes in peripheral blood & megaloblasts in the bone marrow.
- ♣ Folic acid level (N=6-12 µg/l)

♣ **Treatment**

- ⇒ **Prophylactic:** good diet +/- folic acid supplement (800 µg/d) given also for hemolytic anemia, anticonvulsant therapy
- ⇒ **Active:** Folic acid: 1 – 5 mg/day
- ⇒ **B 12:** 1 mg/month for life + Fe to avoid masked Fe deficiency anemia.
- ⇒ **Reticulocytosis** is a sign of successful treatment

**N.B.**

- DNA replication is affected with ↓ nuclear maturation → affection of 3 cell lines → anemia, leucopenia (infections), thrombocytopenia (bleeding tendency)

**II-Pernicious (Addisonian) anemia (vit B12 def)**

- ♣ **Etiology:** long term vegetarian diet + intrinsic factor deficiency
- ♣ **Rare** to become pregnant (usually infertile)
- ♣ **Effect:** anemia + atrophic gastritis + neurological symptoms

**Hemolytic anemia**

- ♣ **Hepato-splenomegaly** is common, except in sickle cell anemia (autosplenectomy)
- ♣ **Hemolytic crises** → hemolytic jaundice
- ♣ **Aplastic crises** → precipitated by infections especially viral.
- ♣ **Sequestration crises** of the spleen.
- ♣ **Autosplenectomy** → in sickle cell anemia.

♣ **Thalassemia**

- 1- **Thalassemia minor:** decrease α chain synthesis >> very mild anemia with minor effect on pregnancy
- 2- **Thalassemia major:** decrease β chain synthesis >> severe anemia, rare to become pregnant

**Treatment:** repeated blood transfusion + folic acid + no iron, splenectomy, desferal (iron chelating agent) to avoid hemosiderosis

♣ **Sickle cell anemia**

- 1- **Sickle cell trait:** very mild anemia + minimal effect on pregnancy.
- 2- **Sickle cell disease**
  - Occlusive crisis: obstruction of vessels, infarction.
  - Hemolytic crisis: anemia & jaundice

- **Investigations:** Hb electrophoresis & Assessment of FWB
- **Treatment:**
  - Avoid occlusive crisis: ↑ hydration, avoid ↓O<sub>2</sub> & infection
  - Repeated blood exchange transfusion to ↑ level of Hb
  - Genetic counseling

## **Thyroid diseases with pregnancy**

### **Thyroid function in pregnancy**

⇒ Increased due to: ↑ production of TSH, ↑ production of thyrotropin by the placenta, the thyroid stimulating effect of B-HCG leading to:

- Increase total serum T3 & T4.
- Decrease T3RU.
- However TBG is also increased
- Thus, free T3 & T4 remain normal & TSH remain normal

### **Thyrotoxicosis in pregnancy**

#### ♣ **Etiology**

- Graves disease (due to LATS antibodies)
- Toxic adenoma (single toxic nodule), toxic multinodular goiter
- Acute (subacute) thyroiditis, viral infection
- GTD
- Cancer ovary (struma ovarii)

#### ♣ **Complication**

##### **-Effect on thyroid:**

- It usually has a tolerable course during pregnancy
- The condition may improve & exacerbates after delivery.

##### **-Effect on pregnancy:**

- Severe hyperthyroidism: anovulation, amenorrhea & infertility.
- **Maternal:** spontaneous abortion & preterm labor, PIH & congestive HF, hyperemesis gravidarum.
- **Fetal:** IUGR, IUFD, Fetal tachycardia, neonatal hyperthyroidism, Fetal thyrotoxicosis & goiter d.t passage of the autoantibodies (IgG).

#### ♣ **Investigation**

- ♣ Increase T4, T3RU, freeT4 index.
- ♣ Decrease TSH.
- ♣ LATS (Graves disease )

#### ♣ **Treatment**

##### **I-Drugs:**

##### ⇒ **Antithyroid drugs**

- ♣ **Propylthiouracil** (drug of choice) 200-400 mg/d
- ♣ **Methimazole** (Carbimazole) 20-40 mg/d



- ☐ They cross the placenta so inhibit synthesis of thyroid hormones → ↓ TSH → fetal hypothyroidism & goiter. So, the lowest dose of medication needed to achieve clinical euthyroidism is administered.
- ☐ They are not an absolute contraindication to breast feeding as their concentration in breast milk are low, however infant's thyroid function should be monitored closely, drugs are given after the feed

⇒ **Beta –blocking agents:**

- ☐ **Types: Propranolol (Inderal) 10mg/d**
- ☐ Used in combination with antithyroid drugs
- ☐ **Action:** block the beta adrenergic receptors, prevent adrenergic effects of thyrotoxicosis, block the conversion of T4 to T3.
- ☐ **The aim**
  - ♣ to maintain the lowest possible doses of anti thyroid drugs
  - ♣ to control symptoms of hyperthyroidism

⇒ **Sedatives:** Phenobarbital 15 mg at bedtime.

**II-Surgery:** Subtotal thyroidectomy is rarely indicated except:

- ♣ Failed medical treatment
- ♣ The patient cannot tolerate medical ttt
- ♣ Large goiters with significant tracheal obstruction
- ♣ It does not eliminate the risk of transplacental passage of LATs and the possibility of fetal & neonatal thyrotoxicosis.

**III-Radioactive:** iodine ablation (I 131) contraindicated in pregnancy.

## Hypothyroidism

♣ **Etiology**

- ♣ **Primary hypothyroidism (TSH is high)**
  - ❖ Hashimoto's thyroiditis (autoimmune)
  - ❖ Iatrogenic (Radioactive iodine 131, surgery, antithyroid drugs)
  - ❖ Iodine deficiency
- ♣ **Secondary hypothyroidism (TSH is low) rare, 2ry to:**
  - ❖ Hypothalamic or pituitary disease, as in Sheehan's
  - ❖ Chromophobe adenoma of pituitary gland

♣ **Complications**

- ♣ **Maternal:** abortion, PIH, abruption placenta, heart failure.
- ♣ **Fetal:** IUGR & IUFD, Congenital hypothyroidism (Obstructed labor) occurs in RAI therapy for thyrotoxicosis, rarely in hypothyroidism

♣ **Clinical picture**

- ♣ Weakness, cold intolerance, lethargy, constipation.
- ♣ Hair loss, dry skin with myxedematous changes, delayed deep tendon reflexes, hoarse voice, puffy face, excessive weight gain.
- ♣ Goiter in primary hypothyroidism.

### 🔥 Investigation

- ♣ Low serum T3RU
- ♣ Increased thyroid antibodies (antimicrosomal, antithyroglobulin) in Hashimoto
- ♣ TSH is low in 2ry hypothyroidism.

### 🔥 Treatment (Replacement therapy)

- ♣ L-thyroxin (T4) 0.05-0.10 mg/day converted in body to T3
- ♣ Breast feeding is not contraindicated.

## Respiratory disorders

### Physiological changes in pregnancy (pressure effect)

- The resting ventilation increases (hyperventilation) >> decrease CO<sub>2</sub>
- Oxygen consumption rises
- Residual lung volume decreases

### 1-Breathlessness (dyspnea)

#### 🔥 Etiology

- ❖ Physiological: in >50% of normal pregnant esp 30-34 wks d.t:
  - a. Mechanical effect of the enlarging uterus (late in pregnancy)
  - b. Hormonal effect of pr on ventilation (explains dyspnea <20 wks)
- ❖ Pathological: Do not forget pulmonary embolism (acute dyspnea)

#### 🔥 Investigation

- ♣ CBC & Hb%
- ♣ Chest X-ray +/- Echocardiography
- ♣ Arterial blood gas
- ♣ Ventilation-perfusion (V/Q) scan

#### 🔥 Management Reassurance in physiological cases

### 2-Maternal smoking

#### 🔥 Tobacco smoke

##### ❖ It contains 3800 constituents' e.g

- ♣ Nicotine: vasoconstriction.
- ♣ CO: it combines with fetal Hb >> carboxyhemoglobin (decrease O<sub>2</sub> carrying capacity >> chronic fetal hypoxia).
- ♣ Benzopyrene: mutagenic & carcinogenic

##### ❖ Effect of smoking on pregnancy

- **General:** bronchitis, emphysema, cardiovascular effects
- **Specific** (especially if heavy smokers)
  - ♣ IUGR: neonates are +/-200 g lighter than non-smokers. That effect is dose related (number of cigarettes/day). This effect may be reversible if smoking is stopped by 16 wks, if not possible, try to decrease cigarettes < 10/day
  - ♣ Increased PNMR (including sudden infant death syndrome)
  - ♣ Spontaneous abortion, PTL, PROM
  - ♣ APH (placental abruption, placenta previa)

### 3-Bronchial asthma (1%)

#### 🔥 Definition

- It is a reversible bronchoconstriction due to airway hyper-reactivity in response to a variety of stimuli.

#### 🔥 Complications :

##### ♣️ **Effect of pregnancy on asthma**

- ⇒ No effect on frequency or severity of asthma

##### ♣️ **Effect of asthma on pregnancy**

- ⇒ Hypertension & IUGR & PTL (very mild, only in severe cases)
- ⇒ Transmission to offspring (5-30 %)

#### 🔥 Management:

##### ➔ Pre-conceptional care

- ❖ Reassurances that continuation of medications is safe, pregnancy is well tolerated
- ❖ Baseline pulmonary functions
- ❖ Minimize ppt factors e.g avoiding allergens
- ❖ Influenza vaccinations if needed

##### ➔ Antenatal care

- ❖ Regular medications are continued (not teratogenic)
- ❖ Inhalation is better than oral agents (↓ systemic & fetal side effects)
- ❖ Glucocorticoids (Betamethazone), Disodium cromoglycate & Ipratropium, B2 agonists, Theophyllines (aminophylline)
- ❖ Patients with acute severe asthma (status asthmaticus) must be hospitalized + O2 + IV fluids + high dose steroids
- ❖ Asthma exacerbation is not an indication for elective delivery.

##### ➔ During labor & delivery :

- ❖ Asthma is rarely a problem in labor.
- ❖ Expert anesthesiologist is needed to maintain adequate maternal O2 & avoid GEA if possible (epidural).
- ❖ Hydrocortisone 300 mg/12hrs
- ❖ Forceps or ventouse be shorten the 2nd stage
- ❖ Avoid the following drugs {Prostaglandin F2α & E2 analogues (misoprostol), Methergine, Pethidine (not a problem in practice)}

##### ➔ Postnatal care :

- ❖ Physiotherapy to maintain adequate pulmonary function.
- ❖ Restart maintenance drug therapy
- ❖ Desensitization therapy could be started after puerperium.
- ❖ Encourage breast-feeding.

# Coagulation defects in obstetric

## Coagulation system & hemostasis

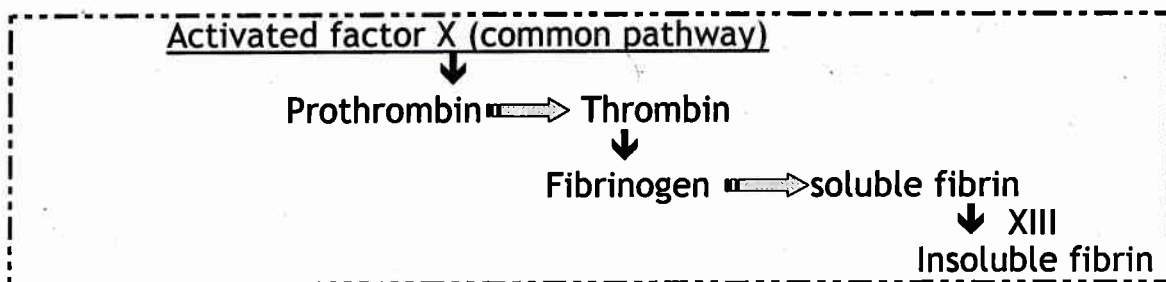
- ❖ **Vascular phase:** vasoconstriction of blood vessels due to vasoactive substances released locally e.g serotonin
- ❖ **Platelet phase:**
  - ⇒ Aggregation of platelets due to release of serotonin, ADP and thromboxane A<sub>2</sub>, adhesions of platelets → platelet plug.
- ❖ **Coagulation phase :** fibrin clot

## Coagulation factors

<b>I</b>	Plasma fibrinogen	<b>VII</b>	Pro-convertin
<b>II</b>	Prothrombin	<b>VIII</b>	Anti-hemophilic factor
<b>III</b>	Tissue thromboplastin	<b>IX</b>	Christmas factor
<b>IV</b>	Calcium	<b>X</b>	Stuart Brower factor
<b>V</b>	Proaccelerin (labial factor)	<b>XI</b>	Plasma thromboplastin antecedent
<b>VI</b>	Still unidentified	<b>XII</b>	Hageman factor
		<b>XIII</b>	Fibrin stabilizing factor

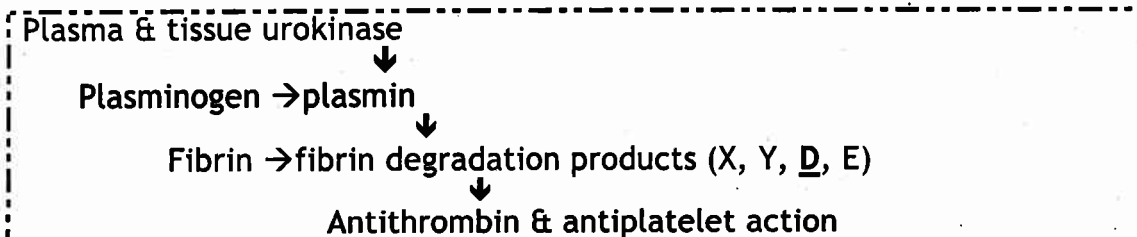
## Pathways:

Intrinsic pathway	Extrinsic pathway
Surface activation ...collagen	Tissue thromboplastin ...activation
XII...XI...IX...X	VII...X
Assessed by PTT	Assessed by PT



- ❖ **Fibrinogen:** Plasma protein formed by liver
  - ⇒ Consists of 3 polypeptide chains linked by disulfide bonds
- ❖ **Thrombin:** Proteolytic enzyme → Split off chains from fibrinogen → fibrin.

## Fibrinolytic system:





### 🔥 **Antifibrinolytic drugs:**

- ❖ Urokinase inhibitors .....Tranexamic acid, EACA, Aprotinine (trasylo)l)
- ❖ Plasmin inhibitors ..... $\alpha$ 1 macroglobulin , $\alpha$ 1 antitrypsin

### 🔥 **Anticoagulant system:**

1. Anti-thrombin III: opposes factor IIa and factors IXa.....XIIa
2. Protein C: vitK dependent: opposes factors V&VIII
3. Protein S: vit K dependent glycoprotein: cofactor for protein C
4. Deficiency of any factor → thrombophilia (hypercoagulable state)

### 🔥 **D.D of bleeding tendency:**

#### ▪ **Congenital :**

1. Von Will brand's disease (AD), commonest congenital disorder:
  - Deficient platelet adhesion, factor 8 & vascular wall weakness
2. Hemophilia A (sex linked recessive → more in ♂ )
  - Deficiency of factor VIII
  - TTT by cryoprecipitate or recombinant factor VIII
3. Hemophilia B: deficiency of factor IX
4. Congenital thrombocytopenia or thrombasthenia

#### ▪ **Acquired**

##### 1. **Immune thrombocytopenic purpura ITP**

a. Destruction of platelets by IgG & crosses placenta to affect fetus.

b. Treatment:

- Mother: blood or platelet transfusion
- Resistant cases: cortisone & immunosuppressive+/- splenectomy
- Recently,  $\gamma$  globulin → block IgG transfer to fetus
- If the patient is in labor .....scalp blood sample
  - platelets >50.000 ....VD is safe
  - Platelets <50.000 ...CS is safe

##### 2. **Circulating anticoagulants:** IgG against factor 8 & TTT: cortisone

##### 3. **DIC**

## Neonatal Jaundice

<b><u>A. Bilirubin Overload</u></b>	<ul style="list-style-type: none"> <li>⌘ ↑Hemolysis, infections, congenital spherocytosis, G6PD deficiency).</li> </ul>
<b><u>B. Uptake defect</u></b>	<ul style="list-style-type: none"> <li>⌘ Deficiency of enzymes responsible for bilirubin uptake (Gilbert's disease).</li> </ul>
<b><u>C. Conjugation Defect</u></b>	<ul style="list-style-type: none"> <li>⌘ Con. <b><u>Deficiency</u></b> of GT (Crigler-Najjar \$)</li> <li>⌘ <b><u>Immaturity</u></b> of GT (Physiological jaundice)</li> <li>⌘ <b><u>Inhibition</u></b>: pregnandiol in the breast milk.</li> <li>⌘ <b><u>Competition for conjugation</u></b>: diazepam, sulphonamides, chloramphenicol, Salicylates, oxytocin, vit K and steroids.</li> <li>⌘ <b><u>Diseased liver Cells</u></b>: hepatitis, toxoplasmosis, congenital syphilis, rubella, cytomegalovirus and herpes simplex</li> </ul>
<b><u>D.Excretion Defect (Obstructive jaundice)</u></b>	<ul style="list-style-type: none"> <li>⌘ <b><u>Failure of transport</u></b> to intra-hepatic bile canaliculi (<b>Dubin-Johnson \$</b>).</li> <li>⌘ Biliary atresia – intrahepatic or extra-hepatic biliary obstruction – inspissated bile, or biliary calculi.</li> </ul>
<b><u>F. Physiological Jaundice</u></b>	<ul style="list-style-type: none"> <li>⌘ Appears on <b><u>3<sup>rd</sup> day, peak at the end of the 1st week</u></b></li> <li>⌘ <b><u>Disappears by the second week.</u></b></li> <li>⌘ It tends to be <b>slight and transient</b> in term infants but <b>severe and prolonged</b> in pre-term infants.</li> <li>⌘ <b>It is due to:</b> liver immaturity (temporary deficiency of GT)</li> <li>⌘ <b>Asymptomatic</b> except when the Jaundice is too deep – the baby becomes apathetic and reluctant to feed.</li> <li>⌘ The <b><u>Stools</u></b> is of <b><u>normal color</u></b>, liver &amp; spleen are normal</li> <li>⌘ Coombs test is negative</li> </ul>

## GRAND MULTIPARITY

❖ Woman with 5 or more deliveries.

### 🔥 Complications

a. During pregnancy:

1. **Miscarriage, anemia and preterm labor.**
2. **Malpresentations** (lax abdominal wall), chronic hypertension, DM & Placenta previa.

b. During labor

1. **Uterine atony** (uterus contains less muscle and more fibrous and elastic tissue)
2. **Obstructed labor** due to mal presentation, macrosomia and Osteomalacia of the pelvis
3. **Uterine rupture**, Post partum hemorrhage, Placenta accrete, ↑ maternal mortality rate

## ELDERLY PRIMIGRAVIDA

❖ It is any woman who is in her first pregnancy while her age is 35 years or more.

### 🔥 Complications

1) During pregnancy:

- ❖ Miscarriage, ↑chromosomal anomalies including Down's \$.
- ❖ Hyper emesis Gravidarum, Pre-eclampsia & Placental abruption.

2) During labor:

- ❖ Prolonged labor & Increased abnormal uterine action.
- ❖ Rigid perineum, ↑caesarean section & maternal mortality rate.

## PENDULOUS ABDOMEN

❖ It is separation of the recti muscles & the uterus falls forwards & overhangs the SP.

### 🔥 Causes

1. Lax abdominal wall.
2. Grand multiparity weakening the abdominal wall.
3. Divarication of the recti muscles.
4. Incisional hernia.
5. Contracted pelvis

### 🔥 Complications

A. During pregnancy

1. Abdominal discomfort and occasionally pain.
2. Malpresentations.
3. Non engagement

**B. During labor:**

**1. Delayed engagement of the presenting part** as the axis of the uterus is acutely angled to that of the pelvis.

**2. Premature rupture of membranes** due Malpresentations and non engagement of the presenting part.

**3. Uterine rupture** may occur if labor is prolonged as the uterine force is misdirected so that the fetus is pushed against the posterior uterine wall.

**🔥 Treatment**

- ✎ During pregnancy a corset is worn.
- ✎ In labor a binder should be applied and the patient nursed on her back
- ✎ With each contraction the patient should draw her uterus upwards
- ✎ Contracted pelvis should be excluded

## HIGH-RISK PREGNANCY

**🔥 Definition**

- ♣ Pregnancy with increased risk for the mother, or the fetus, or the NN

**🔥 Incidence:** 20% of all pregnancies

**🔥 Causes:**

- ✎ History as advanced maternal age, high parity, bad obstetric history.
- ✎ Medical disorders with pregnancy as hypertension, DM, thyroid, renal
- ✎ Obstetric complications: multiple pregnancy, IUGR, ante partum hemorrhage, Polyhydramnios, Malpresentations, RH isoimmunization

**🔥 Management:**

- 1- Frequent ANC, fetal well being, exclude CFMF
- 2- Delivery in well equipped hospitals + specific care
- 3- Partogram & proper management of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> stages of labor
- 4- Care of neonate
- 5- Care of puerperium
- 6- Family planning for each case



# THE NATURAL ANATOMICAL ALTERATIONS OF THE GENITAL TRACT

## (1) Alterations with age

### ♣ The vulva

#### ❖ During puberty:

- 1- ↑ Size of labia minora, clitoris & labia majora.
- 2- Increased subcutaneous fat of the mons and the labia majora.
- 3- Appearance of hair on mons & labia majora

#### ❖ At menopause: All tissues become atrophic.

### ♣ The vagina

#### ❖ Before puberty and after menopause:

- 1- The vaginal wall: atrophic, thin, smooth.
- 2- The rugae are absent.

### ♣ The ovaries

#### ❖ At the reproductive age: they enlarge and the surface becomes dull whitish & partly smooth and partly corrugated.

#### ❖ After menopause: The ovaries shrunk & the surface is corrugated.

### ♣ The uterus

#### ❖ Infantile uterus:

- 1- The cervix is longer than the corpus (2:1).
- 2- No flexion.

#### ❖ Pubertal uterus: the corpus grows in relation to the cervix.

#### ❖ Adult uterus:

- 1 - The cervix is shorter than the corpus (reversed ratio to be 1:2).
- 2- The normal flexion appears.

#### ❖ After menopause:

- 1- The uterus atrophies and fibrous tissue replaces muscular tissue.
- 2- The cavity decreases in size and may become atrophic.

## (2) Changes with coitus

- 1- Disappearance of the fossa navicularis.
- 2- Mechanical disruption of the hymen.

## (3) Changes with vaginal delivery

- 1- The fourchette & perineum are frequently torn and later appear with scars.
- 2- Disruption of the hymen and its remnants are called carunculae myrtiliformes.
- 3- The perineum is commonly reduced in its anterior-posterior length.
- 4- Vaginal orifice becomes wider & greater exposure of vaginal canal.

## CLINICAL PROBLEMS IN GYNECOLOGICAL UROLOGY

### a-abnormal storage of urine

- **Incontinence of urine**

- Involuntary loss of urine that cause social or hygienic problem.

- **Frequency:** Short voiding intervals i.e. micturition more often than usual.

- Urine abnormalities: polyuria, ↑ acidity or presence of oxalates.
- Urinary tract infection.
- Cervicitis: spread of infection to bladder along lymphatics.
- Cystocele.
- Pelvic tumor
- Pregnant uterus (in 1<sup>st</sup> trimester & after engagement).

- **Nocturia:**

- Awakening from sleep to void at night.
- Normally it can happen 1/ night. It is a cause of sleep disorders.

- **Causes:**

- (1) Infection.
- (2) Neurological abnormalities.
- (3) Atrophic changes in elderly.

### B-Abnormal emptying

- **Hesitancy:**

- There is trouble at initiating voiding.
- There is inability to readily start & maintain the urinary stream.
- Causes include
  - (1) Poor urethral relation.
  - (2) Poor detrusor contraction.
  - (3) Partial urethral obstruction e.g., severe urethrocele

- **Straining to void:** voiding accompanied by abdominal straining.

- **Poor stream:** Decreased force of flow of the urinary stream.

- **Post-voiding fullness**

- A persistent feeling of bladder fullness after voiding.
- Causes of incomplete emptying of the bladder:
  - I. Irritation, infection, inflammation & trauma.
  - II. Relaxation of the pelvic supports.
  - III. Vaginal atrophy.

- **Post-micturition dribble**

- Urine loss after completed normal voiding.

- **Retention of urine**

- **Causes**

- **Mechanical causes:**

1. Large cervical or anterior wall subserous fibroid.
2. Incarcerated retroverted gravid uterus.
3. Hematocolpos.
4. Ovarian tumor impacted in the pelvis.
5. Large pelvic hematocele.
6. Stone in the urethra or bladder neck.

- **Nervous causes:**

1. Reflex retention after vaginal, perineal operations.
2. After Wertheim due to interference with bladder innervations
3. Rarely spinal cord lesions causing paraplegia.

- **Treatment:**

- **Slow** evacuation of the bladder by a catheter then treat the cause
    - **If** retention is neglected, this may result in retention with overflow.

### **C-Abnormal sensation**

- **Urgency:** strong, sudden desire to void. The most common urinary symptoms during CBP.

- **Dysuria**

- Burning pain during micturition. There is burning sensation during passage of urine through the urethra.
  - Causes of dysuria:
    1. Urethritis, cystitis.
    2. Local trauma.
    3. Chemical irritation.
    4. Menopausal atrophic changes.
  - Dysuria is to be differentiated from burning on passage of urine on inflamed or traumatized surface of the vulva or the vagina.

# Traumatic lesions of the vulva and vagina

## DIRECT TRAUMA TO VULVA & VAGINA

### • Causes:

- 1- **Vaginal delivery**: It is the most common cause of birth canal injuries.
- 2- **Accidents**: Blunt trauma or cuts and lacerations of the vulva and vagina.
- 3- **Coitus**: Defloration (tearing of the hymen) is accompanied by slight bleeding which spontaneously. Occasionally a large vessel is torn and brisk bleeding may occur.
- 4- **Postoperative**:
  - Inadequate hemostasis during closure of tears and incisions.
  - Careless use of instruments during operation.
- 5- **Spontaneous traumatic tears**: Rupture of the posterior fornix especially at scars of operations associated with atrophic postmenopausal changes.
- 6- **Rupture of varicose veins** in either vulva or vagina.
- 7- **Sanitary towels** & tight underclothing may cause vulval skin abrasions.

• **Clinical features**: abrasions, vaginal bleeding (mild to severe), hematoma

### • Treatment

• Prophylactic antibiotics.

• Surgical interference:

- Examination under anesthesia as the involved tissues are painful.
- Exclude associated injuries of the neighboring or internal organs.
- Suturing the bleeding vessels and the cut tissues.
- Hematoma: Evacuated, bleeding points are arrested, and cavity is obliterated by suturing. Pack or drain is used if hemostasis can not be assured.
- Superficial skin abrasions heal without surgical suturing.
- Mild bleeding from defloration is treated by applying direct pressure on the bleeding point.
- Correction of the general conditions and anti shock measures when appropriate.

## FOREIGN BODIES IN THE VAGINA

### • Types and sources:

- 1) **Therapeutic agents**: Packs, swabs and dressings, ring pessaries.
- 2) **Barrier contraceptives**: Sponges, cervical caps, and even condoms which have slipped off.
- 3) Articles inserted by the patient or entering accidentally as glass jars, rings.



- 4) **Agents for inducing abortion**: as laminaria tent, bougies and catheters.
- 5) **Hygiene articles**: as menstrual tampon, douche nozzles.
- 6) **Vaginal calculus**: Stone formation in cases of accessory ureter, diverticulum of urethra or around foreign body (as suture material).

• **Sequels**

- 1- Infection and offensive vaginal discharge.
- 2- Abrasions, ulceration, perforation and pressure necrosis.
- 3- Urinary and fecal fistula

• **Treatment**

- Removal of the foreign bodies and treatment of infection.
- General anesthesia may be required.

## VAGINAL BURNS

• **Causes of vaginal burns**

- 1- Douching with hot fluids.
- 2- Errors in using diathermy and electric cautery.
- 3- Chemicals: Idiosyncrasy, antiseptics, rock salt.
- 4- Radium and deep X-ray

• **Sequels**

- It varies from superficial burn to extensive lesions with ulceration, cellulitis and fistulous formation.
- Healing can lead to adhesions, scarring, contractures and stenosis.
- The sequelae are hematocolpos and obstructed labor.

• **Treatment**

- ⇒ Rest and antibiotics to control the present infection.
- ⇒ Douches with warm saline on flavin in liquid paraffin.
- ⇒ Local cortisone ointment to limit tissue reaction and fibrosis.
- ⇒ Residual scar tissue may require dilatation or plastic surgery.

# SEXUAL DISORDERS

## 1) Physiology of sexual activity

### ⇒ Stimulation of sexual excitement

- psychological stimulation: precoital petting, neurotransmitters as amphetamines & others → euphoria
- Physical stimulation by
  - 1- The 5 special senses (as visual, auditory)
  - 2- hugs & kisses
  - 3- Tactile stimulation of the nipples, clitoris

### ⇒ physiological response (autonomic)

#### 1. Excitement phase:

- ⇒ The longest phase (could be easily interrupted)
- ⇒ Contraction of perineal muscle, engorgement of clitoris.
- ⇒ Increased secretion (lubrication): from Bartholin gland.
- ⇒ Special sense on stretching (esp the lower 1/3)

#### 2. Plateau phase:

- ⇒ It is maintenance of excitement without reaching orgasm.
- ⇒ Takes longer time in females > males
- ⇒ Ends by reaching a threshold level that triggers orgasm.

#### 3. Orgasm:

- ⇒ The shortest phase
- ⇒ Rhythmic contractions of the vaginal wall, pelvic floor
- ⇒ Dominating sense of pleasure, enjoyment & satisfaction.
- ⇒ Ends by male ejaculation.

#### 4. Resolution (postcoital phase) accompanied by

- ⇒ Marked body sweating
- ⇒ Complete relaxation & calmness

#### 5. Refractory period:

- ⇒ To resume ejaculation: minutes to hours (only in males), as females have no ejaculation⊙.

## 2) Female sexual dysfunction

1. Developmental & psychological factors as -ve cultural attitudes towards sex, guilty feeling, lesbianism, traumatic, sexual experience.
2. Affective factors: anxiety, poor self esteem, fear of pregnancy.
3. Interpersonal factors as poor communication between partners hostility towards husband
4. Cognitive factors as sexual ignorance.

Other factors: as lack of precoital petting, clumsy hasty practice or forced method for contraception.

## Types:

### ▪ According to onset may be:

- 1- 1ry sexual dysfunction:
  - Is those who never had normal sexual activity
- 2- 2ry sexual dysfunction
  - Sexual dysfunction after a period of normal sexual activity.

### ▪ According to C/P:

#### 1- Frigidity:

- **Definition:** (Latin: fragidus = cold)
  - 1- Traditional definition: females who lack emotional & physical sexual response.
  - 2- Recently frigidity is considered a vague term & new term of the same condition (lacking orgasmic capacity).

#### 2- Anorgasmia

- **Definition:**
  - Failure to reach orgasm.
- **Incidence:**
  - In uncircumcised female 5-10 %.
  - In circumcised female 48 %.
- **Types:**
  - **1ry:** early psychiatric trauma or profound defect of personality
  - **2ry:**
    - 1- **Situational:** as pregnancy or fear of pregnancy marital stress or dyspareunia.
    - 2- **Coital:** the orgasm is not reached during sexual intercourse but can be achieved by alternatives as masturbations.
  - 3- **Failure to receive stimulation**
    - a. Problem is sexual arousal.
    - b. Failure of the husband to act the excitement phase (common problem).

#### 3- Chronic pelvic congestion

- **Definition:** Non resolved sexual tension syndrome
- **Causes:**
  - 1- Chronic anorgasmia.
  - 2- Coitus interrupts, lesbian love, long coitus.
- **C/P:**
  - Bilateral adenal pain, low back ache.
  - Attacks of depression.
- **D.D:** Dyspepsia, spastic colon.

- **Investigation:**

- U/S
- Venography to detect the varicose veins.

#### **4- Dyspareunia**

- **Definition:**

- Pain due to coitus (during or immediately after coitus).

- **Causes:**

- 1ry: usually psychological
- 2ry: an acquired disorder, unrelated to 1<sup>st</sup> coitus
- organic causes include

- A. Superficial dyspareunia:**

- a. Introital lesions
  - b. Vulval lesions: skin, clitoral, urethral lesions.
  - c. Vaginal lesions
  - d. Reaction to local contraception
    - i. Improperly fitted or inadequately lubricated condoms.
    - ii. Allergy to contents of contraceptive foam.
  - e. Radiation

- B. Deep dyspareunia:**

- a. Endometriosis
  - b. PID
  - c. RVF
  - d. Short vagina after surgery

- **Examination:**

- Local examination for introital, uterine displacement & other pelvic pathology.

- **Treatment:**

- 1- Treatment of the cause as tight hymenal ring may be stretched in the physician's office, use of soothing ointment (e.g: Xylocaine)
- 2- Advise the husband on posterior intromission to avoid pressure on the sensitive urethra
- 3- If the vulva is swollen & painful → put a wet dressing of dilute aluminum acetate solution + analgesics.

#### **5- Vaginismus**

- **Definition:**

- Involuntary spasm of the lower vaginal muscles resulting from a woman's unconscious desire to prevent penetration (may lead to unconsummated marriage).



- **Etiology:**

- 1- Dyspareunia, even after treating the orgasmic cause of dyspareunia, the memory of pain can lead to vaginismus.
- 2- Other causes: fear of pregnancy, sexual phobias.

- **Diagnosis**

- 1- Avoidance reaction (involuntary vaginismus).
- 2- Psychological causes may be obvious.

- **Treatment:**

- 1- Correct any painful organic disorder.
- 2- EUA
  - a. Anesthesia overcome the spasm & helps to exclude the organic lesions.
  - b. Vaginal dilatation to reassure the patient.
- 3- If vaginismus persists → learning techniques to relax the muscle spasm has to be started as
  - a. Progressive dilatation program
  - b. Educational counseling interpersonal communication is encouraged with the husband to combat sexual ignorance; the patient can examine herself using a mirror.
- 4- Failure of treatment is an indication of psychiatric counseling.

### 3) Abnormal sexual differentiation

- **Types of sexual differentiation**

- 1- Genetic sex:** chromosomal sex (xx: female, xy: male)
- 2- Gonadal sex:** ovaries / testis
- 3- Genital sex:** external genitalia (either male or female)
- 4- Hormonal sex:** phenotypic sex (development of 2ry sexual characters of male or female).
- 5- Sex of rearing** (Gender sex).
- 6- Gender identify:** one's own feeling of sexuality.

• **Definitions**

Term	Definition
<b>Hermaphrodite</b>	It is the incomplete differentiation into male or female
<b>True hermaphrodite</b>	Both testis & ovary are found may be xx or xy or mosaic, ambiguous external genitalia raised as male in 75% of cases, At puberty breast development & menses may occur in 50 % of cases.
<b>Male pseudo hermaphrodite (46xy)</b>	Testis + external female genitalia as in female TF syndrome, decrease 5 $\alpha$ reductase.
<b>Female pseudo hermaphrodite (46xx)</b>	Ovary +external male phenotype as increase androgen.

• **Classification**

**1-disorders of fetal endocrinology**

	♀ pseudo-hermaphrodite	♂ pseudo-hermaphrodite
<b>Disorder</b>	Partially virilized female	Incomplete virilized male
<b>Gonad</b>	Ovary (46xx)	Testis (46xy)
<b>Androgen</b>	Increased	Decreased
<b>Ext. genitalia (ambiguous )</b>	- > 12 <sup>th</sup> wk ....clitorimegaly - < 12 <sup>th</sup> wk : fusion of labia	- Small penis, hypospadias unfusion of scrotum - Undescended testis
<b>Etiology</b>	- Cong. adrenal hyperplasia - Aromatase deficiency - ↑ androgen exposure in pregnancy - Drug: synthetic prog. - Luteoma, tumor	- Gonadotrophin resistant testis - Testosterone synthesis defect - Androgen insensitivity synd. - Anti-Mullerian hormone deficiency: uterus, tubes present in a hernia - 5 $\alpha$ -reductase deficiency: virilization occurs at puberty

## 2- Disorders of gonadal development

- **True hermaphrodite:**

- ♣ Gonads: both testicular & ovarian tissues are present
- ♣ Karyotype: may be xx or xy or mosaic
- ♣ External genitalia ....ambiguous
- ♣ Raised as males in 75% of cases
- ♣ At puberty :breast development & menses in 50 % of cases
- ♣ Diagnosis is made by gonadal biopsy: few oocytes +testicular tissue

- **Pure gonadal dysgenesis:**

- ♣ Gonads: streak (fibrous band)
- ♣ Karyotype: 46xy (Swyer \$) or rarely 46xx
- ♣ Phenotype: female
- ♣ External & internal genitalia: female but infantile

- **Noonan syndrome (autosomal dominant)**

- ♣ It is an autosomal dominant condition.
- ♣ Karyotype 46xy or 46xx
- ♣ Phenotype: turner-like (the characteristic cardiac lesion → pulmonary stenosis.

- **Gonadal dysgenesis either with**

Normal chromosomes	Abnormal chromosomes
- Pure gonadal agenesis	- Mixed gonadal dysgenesis
- Noonan syndrome	- Turner syndrome
- Bilateral agenesis of testis	- Klinefelter syndrome
- Anorchia (no testis)	- Triple X syndrome
- Sex reversal ♂ (normal ♂)	- Extra Y chromosomes

- **Congenital adrenal hyperplasia (commonest cause of intersex)**

- **Cause:** deficient 21-hydroxylase (95 %) or 11 β hydroxylase.
- **The diagnosis of CAH should be suspected in:**
  - Neonate with ambiguous genitalia.
  - Phenotypic male without palpable testes.
  - Severe vomiting, hypoglycemia, and shock.
  - Premature virilization.
  - Phenotypic female with any degree of virilization.
  - Virilism may be within the first year of life:

- Forms of virilism: Pubic hair, lower voice, muscular hyperplasia, or excessive growth.
- The salt-losing form of CAH: It is 2ry to ↓ aldosterone secretion. It is associated with the most severe form of virilization. Salt loss, ↓ Na & shock may be life threatening.

➤ **Pathogenesis:**

- Failure of the adrenal to form cortisol from 17 OH P.
- Lack of -ve feed back on ACTH → increase ACTH hyperplasia of the adrenal + ↑ androgens & 17 α OH P.

➤ **Types:**

- **Juvenile type (salt losing):** Ambiguous genitalia at birth (clitorimegaly, fusion of labia), shock
- **Adult (late onset):** normal child, amenorrhea, virilization after puberty

➤ **Investigation:**

- Increase 17 α OH progesterone > 200 ng/dl which increase by ACTH suppression test (0.25 mg) → 800-1200 ng/dl
- ↑ androgen, ↓ cortisol

▪ **Treatment:**

- Prednisone for life (adjusted by the levels of DHEAs)
- Surgical correction of external genitalia in 1st 2 years of life.

**N.B. Enzyme Deficiencies**

1) **Congenital lipoid adrenal hyperplasia (AR):**

- Inability to convert cholesterol to pregnenolone
- C/P: ↓ (K, Na, PH).
- Karyotype is XX or XY (do not have a uterus).
- Phenotype is female.

2) **17αhydroxylase deficiency (very rare):**

- 1ry amenorrhea & absent 2ry sex characters, HTN, ↓ K, alkalosis.
- P can't be converted to cortisol, ↑ ACTH & aldosterone.
- Karyotype is 46 XX (have a uterus) or 46 XY (have no uterus).
- Phenotype is female.
- Treatment involves estrogen and glucocorticoid replacement

3) **5α-reductase deficiency:**

- 1ry amenorrhea, no breast development at puberty (suppressed by high testosterone), low gonadotrophin level, and normal internal male genitalia. There are ambiguous genitalia at birth. Virilization usually occurs at puberty.
- female phenotype.
- 46xy karyotype.



## Management of ambiguous genitalia

### ■ History:

- Family history of similar condition as TFS or CAH
- Maternal exposure to androgen.

### ■ Examination:

#### ○ Inspection:

- ⇒ Site of urethra (perineal or penile).
- ⇒ Fusion of labia, vaginal pouch.

#### ○ Palpation: gonads (in the scrotum or in the inguinal canal)

#### ○ P/R feel cervix

#### ○ Measurement of stretched phallus (for SP to the lip)

- ⇒ Normal clitoris < 1 cm
- ⇒ Normal penis at birth 2.8-4.2 cm

### ■ Investigation: as intersex.

#### ○ Karyotyping

#### ○ Buccal smear (Barr body): in 50 % only

- ⇒ Present under the nuclear membrane if 2 X chromosomes.
- ⇒ So females are Barr +ve while males are -ve.

#### ○ Examination of neutrophils: in 25 % only.

- ⇒ A drum stick appearance due to attachment of the chromatin mass (if 2x) to 1 of the lobes of the nucleus.

#### ○ Chromosomal culture: Skin, blood or bone marrow is cultured by special methods determine the number & shape of chromosomes (karyotyping).

#### ○ Hormonal profile: Estrogen, testosterone, DHEAs, 17αOH P levels, cortisol (blood or urine).

#### ○ U/S, laparoscopy, laparotomy → histological ex of gonads

#### ○ CT, MRI of ovary and adrenal gland to diagnose tumor.

### ■ Treatment:

- Gender determination: depends on external genitalia & sex of rearing
- Plastic surgery of external genitalia (best age > 3 years & artificial vagina after marriage).
- Gonadectomy (if there is Y cell line) + HRT.
- Emergency situation: correction of salt losing CAH.

## PEDIATRIC AND ADOLESCENT PROBLEMS

### ▪ Clinical examination of young female before puberty:

- 1- The child should be treated with particular care for fear of lasting psychological consequences.
- 2- A PR is equally informative & easier to perform than PV.
- 3- Examination under general anesthesia may be necessary for those who refuse to cooperate.
- 4- Inguinal examinations may reveal a hernia or gonad.
- 5- Tanner classification is used.
- 6- Note the perineal hygiene, pubic hair, hymenal configuration, and size of the clitoris.

## PREPUBERTAL VULVOVAGINITIS

- Vulvovaginitis is the most common gyn complaint in prepubertal girls.
- Physiological vulvovaginal discharge before puberty:

### 1) Newborns:

- 1- Physiologic leucorrhea.
- 2- Blood stained little discharge: Result from withdrawal maternal estrogen.

### 2) Early puberty: Risk factors of pre-pubertal vulvovaginitis:

- 1- The normal pH is neutral rather than acidic.
- 2- Lack of estrogen.
- 3- Lack of protective hair and labial fat pads
- 4- Lack of natural antibodies.
- 5- Improper local hygiene.

### Clinical types of pre-pubertal vulvovaginitis

#### (1) **Vulvovaginitis in newborns:**

- 1- Diaper rash, ammoniacal dermatitis due to urine and stools.
- 2- Fungus infection transmitted from the mother.

#### (2) **Children and adolescent vulvovaginitis**

##### a) **Infectious microorganisms:**

- 1- Nonspecific bacterial vaginitis: These are the most common as E coli, streptococci, and staphylococci species.
- 2- Fungal infections are less common than bacterial infection.
- 3- Neisseria gonorrhea or trichomonas: in sexual abuse

- ##### b) **Chemical non-infective vulvovaginitis:** Irritation of the perineal and vulvar skin, allergy and irritation, reaction to soaps, clothes, and chemicals in bubble baths.

**Recurrence of vulvovaginitis often develops in the following conditions:**

- 1- Hematogenous spread from systemic infections as from upper respiratory infection.
- 2- Failure to follow proper hygiene, especially with obese girls and excess skin folds.
- 3- Foreign bodies

**Clinical presentation of retained foreign bodies in the vagina:**

- 1- Hemorrhagic or purulent discharge don't respond to treatment.
- 2- Genital pruritis, abdominal pain, or fever.
- 3- If the object remains undetected, peritonitis can develop from the ascending of purulent secretions to the fallopian tubes.

**Type of foreign bodies:** Vary from toilet paper, buttons, or coins.

**Management:**

- 1- Antibiotics should be started before removal of the foreign body.
- 2- Removal of the foreign body using vaginal speculum.
- 3- General anesthesia may be necessary.

**VAGINAL BLEEDING**

- Vaginal bleeding before puberty is usually mild.
- **Possible causes**
  - 1- Vulvovaginitis: It may cause vaginal bleeding.
  - 2- Neoplastic causes.
  - 3- Dysfunctional uterine bleeding
  - 4- Endometrial shedding:
    - i. Physiologic neonatal withdrawal bleeding (birth crisis) in the first 2 weeks of life.
    - ii. Usage of medications containing exogenous estrogens.
    - iii. Functional ovarian cysts and ovarian neoplasms.
    - iv. Precocious puberty.
  - 5- Vulvar or vaginal irritation with scratching and skin affection.
  - 6- Local trauma as accidental falling down or sexual abuse.
  - 7- Foreign body inside the vagina.

## **LABIAL ADHESIONS (agglutination)**

- ◆ Midline interlabial adhesions result in closure of the introitus.
- ◆ The labia are easily separated surgically.
- ◆ Acquired cases are more common than congenital cases.
- ◆ **Types:**
  - A) Congenital labial adhesions.
  - B) Acquired agglutination of the labia minora:
    - Occurs in children (commonest 2-6 years) & after menopause.
    - It follows mild chronic non-specific vulvovaginitis and adhesions of the raw edges (adhesive vulvitis).
    - Low-estrogen environment helps fusion of the labia in response to mild genital trauma, even to diaper rash.
- ◆ **Treatment:** Separation of the fused labia and local estrogen ointment twice daily for 2-4 weeks.
- ◆ **Differential diagnosis:** Congenital adrenogenital syndrome which is the commonest cause the interrex.

## **GENITAL INJURIES**

- ◆ Common types of genital injuries before puberty
  - Straddle blunt perineal injuries**
- ◆ C/P: ecchymosis, hematoma & painful swelling, hematuria, perineal pain, and resistance at urethral catheterization.
- ◆ Treatment:
  - Urethral catheterization, analgesics, and prophylactic antibiotics
  - Observation and cold compresses for the first 6 hours.
  - If the hematoma remains stable or smaller, warm sitz baths.
- Accidental penetrating trauma**
- ◆ Falling on a sharp object, as a pen or pencil.
- ◆ Presentation: hematuria, vaginal discharge, or bleeding. A puncture wound may not be obvious. Penetration may be intra-peritoneal with rectal pain or bleeding.
- Sexual abuse**



## GENITAL NEOPLASMS

- ◆ Benign and malignant genital tumors are relatively uncommon.
- ◆ Conditions in the differential diagnosis for malignancy:
  - 1- Chronic genital ulcer.
  - 2- Tissue protruding from the vagina.
  - 3- A malodorous bloody vaginal discharge.
  - 4- Non-traumatic swelling of the external genitalia.

### The most common malignant tumors before puberty are:

1. **Sarcoma botryoids:** The most aggressive malignant tumor of the genital tract in girls.
2. **Embryonal carcinoma, mesonephric carcinoma, and clear cell adenocarcinoma:** The youngest case reported was in a 7-year-old.
3. **Germ cell tumors** are the most common ovarian neoplasms in the pediatric population.

## RADIOTHERAPY

### A. External irradiation (Teletherapy)

- ⇒ Old ...deep x-ray ...more skin affection & less tissue penetration
- ⇒ Now ...supervoltage pumps ...linear accelerator, Cobalt 60
- ⇒ Dose: 5000 R (divided on 5days for 5weeks)
- ⇒ Area: inverted pear shaped area to cover cervix, lower uterus, upper vagina, parametrium but flattened anteroposteriorly (decrease affection of bladder & rectum)

### B. Internal irradiation (brachytherapy)

- ⇒ Types:
  - Intracavitary: packing of uterus & vaginal vault by radium or cesium
  - Interstitial: radioactive needle penetrates the tumor tissue

#### ⇒ Method of application:

	Paris	Stockholm	Manchester
<b>Dose</b>	Small 66.6mg	Large (100mg)	Calculated
<b>Duration</b>	1week	1d....1week rest...1day	3d....1week rest ...3d

#### ⇒ Dosage calculation:

##### ★ Older method:

- **Point A** (2cm above lateral fornix & 2cm lateral to cervical canal → should receive 8000R)
- **Point B** (2cm above lateral fornix & 5cm lateral to cervical canal) should receive 5000R

★ **Modern method:** by computerized dosimetry

⇒ **Technique of brachytherapy**

1. GEA in the lithotomy position, sounding of uterine cavity
2. Cervix is dilated to allow insertion of IU pellets or tandem
3. Vagina is packed with gauze or colpostate to keep them at their position (removed 2 d later). Urinary self retaining catheter is left
4. X-Ray: check the proper position of applicators
5. After loading technique: for doctor safety, applicators are loaded automatically after proper insertion of empty applicators

## CHEMOTHERAPY

- ◆ **Cell cycle:** M phase, G1 phase 50%, S, G2phase 20% & G0 (latent phase)
- ◆ Drugs are either phase specific or non specific
- ◆ **Types** of cells are renewing, expanding, static
- ◆ **Chemotherapeutic drugs**

	Drugs	Actions	Side effects
<b>Alkylating agents</b>	Cyclophosphamide Melphalan	Phase non specific	Hemorrhagic cystitis
<b>Antimetabolites</b>	Methotrexate 5-fluorouracil	Act on S phase ...↓ metabolites for DNA	Ulcers of mucous memb, pseudo-memb. Colitis
<b>Antibiotics</b>	Actinomycin D Bleomycin Adriamycin	Act on S phase ...inhibit DNA formation	Hepatotoxic, lung fibrosis, cardiotoxic
<b>Plant alkaloids</b>	Vincristine Etoposide, Taxol	Act on M phase, inhibit mitosis	Neurotoxic
<b>Platinum compounds</b>	Cis-platinum Carbo-platinum	Phase non specific	Nephrotoxic

◆ **General side effects**

1. Bone marrow depression.
2. GIT irritation ...nausea, vomiting.
3. Skin & hair affection.
  - **Therefore**, before giving the drugs ...CBC, liver & renal function tests.
  - **To ↓ side effects** ...drugs are given in courses about 6 courses, 4weeks in between to allow renewal of normal cells however, the tumor may regrow.

◆ **Common combination chemotherapy**

- ⇒ **BEP** ...Bleomycin, Etoposide, cis-Platinum, for germ cell tumors
- ⇒ **CAP**...Cyclophosphamide, Adriamycin, cis-Platinum, for epithelial tumors.
- ⇒ **EMA-CO ...MAC** ...for choriocarcinoma.
- ⇒ **VAC**: vincristine, Actinomycin, Cyclophosphamide ...for sarcoma botryoids.

◆ **The most commonly used in gynecologic practice is methotrexate:**

- ♣ **Dose:** vials (50mg/m<sup>2</sup> surface area) → may be given orally.
- ♣ **Action:** antimetabolite (inhibits DNA synthesis by folinic acid antagonists).
- ♣ **Antidote:** folinic acid rescue (5 mg every other day) to decrease the side effects.

**The residual ovary syndrome**

- **Cause:** It occurs after leaving one or both ovaries after hysterectomy
- **C/P:** Chronic lower abdominal pain ± dyspareunia
- It is due to an enlarged ovary containing a cyst surrounded by adhesions

## TUMOR MARKERS

⇒ **Definition:** substances released in association with certain tumors.

⇒ **Measurements:** The serum level correlates with the tumor bulk.

⇒ **Values of measuring tumor markers:**

1. During treatment: Assess tumor response to treatment.
2. During follow up: Detection of recurrence.
3. Initially for diagnosis.

⇒ **The markers are unreliable screening test of general population as:**

1. They are not sensitive in the early stages.
2. Bulks of the tumor mass need to exist before significant levels can be detected. The false negative rate in early stages is high.
3. They are nonspecific: it ↑ in normal states & in benign conditions.

### Tumor Markers in Gynecological Oncology

◆ **Carcinoma antigen-125 (CA-125):**

**A. Physiological:**

1. Normal women: up to 35 U/ml.
2. 1<sup>st</sup> trimester of pregnancy, as the decidua produces CA-125.

**B. Pathological rise:**

**1. Malignant conditions:**

- a. Nonmucinous epithelial ovarian carcinoma (80% of cases).
- b. Adenocarcinoma of endometrium, endocx & F. tubes.
- c. Non-gyn malignancy: breast, lung, colon, pancreas.

2. **Benign conditions:** Fibroids, endometriosis, PID, hepatic cirrhosis & renal failure.

**C. Constant or reduced levels are with the benign conditions.**

◆ **Alpha-fetoprotein (a-FP):**

- a. **Normal values:** up to 25 u/l.
- b. **Physiological production:** Fetal liver, GIT & the yolk sac.
- c. **Pathological production:**
  - i. Germ cell tr that contain yolk sac elements: e.g. endodermal
  - ii. Non-gyn tumors: Hepato-cellular carcinoma, GIT carcinoma

◆ **Carcinoembryonic antigen (CEA):**

1. **Normal values:** up to 5 nanograms/ml
2. **Physiological production:** by embryonic tissues.
3. **Pathological production:**
  - 1- Benign and malignant lesions of the gastrointestinal tract.
  - 2- Mucinous carcinoma of the ovary.
  - 3- Endometrial carcinoma
  - 4- Adenocarcinoma of the cervix.

◆ **Human chorionic gonadotrophin (HCG):**

1. **Normal nonpregnant values:** up to 1 ng/ml.
2. **Physiological production:** normal pregnancy.
3. **Pathological production:**
  - 1- Gestational trophoblastic tumors.
  - 2- Ovarian choriocarcinoma,
  - 3- Embryonal carcinoma
  - 4- Malignant teratomas containing trophoblastic tissue.

◆ **Inhibin (inhibits FSH release)**

1. **Physiological production:** Granulosa cells of the ovary.
2. **Pathological production:** Granulosa cell tumors.

◆ **Placental alkaline phosphatase** high level is recorded in:

- 1- Ovarian cancer: particularly germ cell tumors, e.g. dysgerminoma.
- 2- Non-gynecological malignancy of breast, lung, stomach.
- 3- Benign conditions: hepatitis, colitis.
- 4- Heavy smokers.



# Management of advanced pelvic malignancy

- The aim is to improve quality of life & to keep normal daily activity as long as possible not ↑ survival.

## **A- Management of Physical Conditions**

- The common distressing symptoms in advanced malignancy:

### **1- Cancer pain:**

- **Chronic unrelieved pain** causes insomnia & depression.

- **Types:**

- a. **Visceral:** (the pelvic organs ± the peritoneum).

- i. The pain is diffuse dull aching but may be colicky.

- ii. **Examples:** uterine spasms (e.g. pyometra), intestinal obstruction, renal and ureteric obstruction.

- b. **Somatic:** (muscle, bone, connective tissue, nerves plexuses)

Shooting or throbbing pain related to certain nerves.

- **Methods of pain relieve:**

- i. Antiprostaglandin & narcotics.

- ii. Morphia in liberal doses & addiction is not a concern.

- iii. Nerve block, as intrathecal destructive agents & cordotomy.

### **2- Anorexia:** corticosteroid preparations might help.

### **3- Nausea:** antiemetics.

### **4- Cachexia:** attention to nutritional intake & consider IV route.

### **5- Tumor-associated hemorrhages:**

- a. **Fibrinolytic inhibitors:** Tranexamic acid & aminocaproic acid.

- b. **Local treatment:** as diathermy.

### **6- Anemia:** Medical treatment is given.

### **7- Pyometra:** Surgical drainage and antibiotics.

### **8- Malig. urinary or fecal fistula:** catheter, transplantation or colpoclysis

### **9- Obstructive uropathy:** surgical relieve of the obstruction.

### **10- Metastasis to bone:** Spine is the commonest site of skeletal metastasis.

- a. **Aim:** ↓ pain, prevent pathological fractures & ↑ mobility.

- b. Local radiotherapy can alleviate the pain.

### **11- Psychological and social aspects:** antidepressants and hypnotics.

## **B- Control of the tumor growth**

- 1- **Wide dissemination to lungs, liver:** Chemotherapy.
- 2- **Wide regional involvement** (e.g. cancer ovary restricted to peritoneal cavity):
  - No tumor masses < 2 cm in diameter: radiotherapy & chemotherapy.
  - Tumor masses > 2 cm: chemotherapy.
  - Restricted regional involvement (e.g. cancer confined to the pelvis);
    - i. Radiotherapy can be given in a high dose.
    - ii. Operative procedures:

### **Pelvic exenteration ± chemotherapy**

- **Selection of patient for pelvic exenteration:**
  1. Good general health.
  2. Extensive local disease involving the bladder and/or the rectum.
  3. No pelvic wall involvement.
  4. No distant metastases.
  5. Central pelvic recurrent disease after primary RT.
- **Types of pelvic exenteration** (anterior, posterior & total)
- **Prognosis of total pelvic exenteration:** 5-year survival: 30 %.
- **Complications of exenteration** include high 1ry mortality (10 %).

### **Minimally invasive procedures:**

- a. Relief of urinary or intestinal obstruction.
- b. Techniques for urinary or intestinal fistula

## **C- Nursing and Social Support**

1. Nutrition and IV fluids: the role of dietitian is essential.
2. Monitor weight and hydration status.
3. Attention to the patient social life and daily interview.
4. Physical exercise program and body activity
5. Sleep hygiene. Establish routine sleep pattern
6. Incontinence: frequent changing of pads and sheets, and care of the catheters and colostomy.
7. Bedridden patient: that stage has to be delayed as long as possible

# DIFFERENTIAL DIAGNOSIS

## Indications of vaginal packs

### ⊙ **Vagina:**

- 1- Postoperative.
- 2- In some cases of extensive tears after delivery
- 3- To reposit prolapse to treat trophic ulcers

### ⊙ **Cervix**

- 1) After repair of cervical lacerations
- 2) Some cases of cancer cervix
- 3) Post operative

## Indications of uterine packs

- a. Atonic PPH
- b. After correction of acute inversion
- c. In placenta previa if bleeding occurs from the lower uterine segment after labor

## Retention of Urine

### ⊙ **Causes**

#### ◆ Mechanical causes:

1. Large cervical or anterior wall subserous fibroid.
2. Incarcerated retroverted gravid uterus.
3. Hematocolpos.
4. Ovarian tumor impacted in the pelvis.
5. Large pelvic hematocele.
6. Stone in the urethra or bladder neck.

#### ◆ Nervous causes:

1. Reflex retention after vaginal, perineal operations or during early puerperium.
2. After Wertheim operation due to interference with bladder innervations
3. Rarely spinal cord lesions causing paraplegia.

### ⊙ **Treatment:**

- ◆ Slow evacuation of the bladder by a catheter followed by, dealing With the cause
- ◆ If retention of urine is neglected, this may result in retention with overflow.



## Frequency of Urine

1. **Urine abnormalities** as polyuria, increased acidity or presence of oxalates or infection.
2. **Cervicitis** due to spread of infection into the bladder along lymphatics.
3. **Cystocele.**
4. **Pelvic tumor**
5. **Pregnant uterus** (in the 1<sup>st</sup> trimester & after engagement).

## Uterine casts

1. Decidual casts in cases of abortion or disturbed ectopic pregnancy.
2. Membranous casts in cases of membranous dysmenorrhea.
3. Blood casts in cases of severe genital infection.

## Masses in Douglass pouch

◆ In masses of DP, PR is done to detect relation of the mass to the rectum

1- Uterine:

- ⇒ Retroverted uterus is the commonest mass felt through the posterior
- ⇒ Vaginal fornix.
- ⇒ Posterior wall fibroid.

2- Tubal

- ⇒ Hydrosalpinx or pyosalpinx.
- ⇒ Tubal pregnancy.

3- Ovarian masses.

4- Mass in peritoneum of Douglas pouch:

- ⇒ Pelvic hematocele or pelvic abscess.
- ⇒ Endometriotic nodules of the pelvic peritoneum & rectovaginal
- ⇒ Septum.
- ⇒ Metastatic nodules from cancer of ovary.
- ⇒ Tuberculous nodules.

5- Ectopic kidney.

6- Mass in the rectum: Cancer or fecal mass (could be indented by the Fingers).

7- Retroperitoneal tumor.

## Amenorrhea after Labor

1. Lactation.
2. Another pregnancy.
3. Sheehan syndrome.
4. Asherman syndrome.
5. Chiari Frommel syndrome
6. Any other cause of 2ry amenorrhea

## Short Period of Amenorrhea Followed By Bleeding

- Abortion, EP & VM.
- Metropathia hemorrhagica.
- Hematoma in a corpus luteum cyst.

## Pain & Abnormal Vaginal Bleeding

- Bleeding in early pregnancy (abortion, EP, VM).
- Hemorrhage or rupture of a CL cyst, pyosalpinx & hematosalpinx
- Malignant tumors of genital tract. Pain is late.
- Submucous fibroid polyp.
- Pelvic endometriosis.
- Chronic cervicitis and chronic salpingitis.
- Post-insertion pain and bleeding of an IUD
- Chronic ovulatory pain (Mittelschmerz) & bleeding.
- Imperforate hymen or transverse vaginal septum.

## Pelviabdominal mass

### • Diagnosis:

- Can feel the upper margin not the lower.
- Moves from side to side
- Dullness over mass, the flanks are resonant

### • Common swellings (6F)

- Fetus (pregnancy), fibroid, fat (obesity), flatulence or fecal mass, full bladder, fluid (ascites or ovarian mass).

- **Differential diagnosis:**

1. **Uterine:** pregnancy, tumors; fibroid, sarcoma, hemato/pyometra.  
**Characters:** central, symmetrical or asymmetrical, solid or cystic, when moving the mass, it is transmitted to the cervix
2. **Ovarian:** (neoplastic or non neoplastic)  
**Characters:** unilateral or bilateral, lateral or central if very large, solid or cystic, swelling is separable from cx & uterus, its movement not transmitted to cx
3. **Broad ligament:** Cyst, hematoma, parametritis, abscess, myoma  
**CCC:** limited mobility, lateral to uterus, displaces uterus to 1 side
4. **Tubal:** hematosalpinx, hydrosalpinx, pyosalpinx, tumors of tube  
**Characters:** lateral, above inguinal ligament, adnexal swelling
5. **Vaginal:** hematocolpos  
**Characters:** cystic with uterus on top, felt by PR examination  
Cause is found as imperforate hymen, transverse septum
6. **DP:** Pelvic hematocele, pelvic abscess, encysted TB peritonitis  
**Characters:** ill defined swelling pushing uterus forwards
7. **Others:** Full bladder, hydronephrosis, mesenteric cyst, pancreatic cyst, retroperitoneal mass, fecal mass, flatulence

### **Pelviabdominal mass + pain**

- Complications of pregnancy
- Complication in any mass
- Cryptomenorrhea
- Inflammatory → PID, pyometra

### **Pelviabdominal mass + amenorrhea**

1. Pregnancy, pseudocyesis.
2. Uterine swelling: hematometra, pyometra.
3. Cryptomenorrhea.
4. Inflammatory: encysted TB peritonitis.
5. Ovarian tumors if functioning, malignant cachexia, destroying both ovaries.

## **Pelviabdominal mass + abnormal bleeding**

1. Complications of pregnancy
2. Uterine tumors: fibroid or sarcoma
3. Inflammatory: large tubo-ovarian complex
4. Ovarian tumors if functioning, pelvic congestion, 2ries to uterus

## **Causes of symmetrically enlarged uterus**

### **a. Pregnancy:**

- The patient is in the childbearing period.
- **Symptoms** e.g. amenorrhea, frequency, nausea etc...
- **Signs:** Breasts signs, the uterus is soft & the cervix is soft & bluish.
- **Pregnancy test** is positive & ultrasound is helpful.

### **b. Metropathia hemorrhagica:**

- It commonly occurs before menopause or after puberty.
- **Symptoms:** Short period of amenorrhea followed by painless prolonged bleeding.
- **Signs:** Uterus is symmetrically enlarged, firm & the ovaries are cystic.
- **Endometrial biopsy:** cystic glandular hyperplasia & US is helpful.

### **c. Single submucous or single interstitial fundal fibroid:**

- The patient is usually above 30 years, nullipara or of low parity.
- **Symptoms:** Menorrhagia, sometimes metrorrhagia and infected discharge.
- **Signs:** The uterus is symmetrically enlarged and firm.
- **Ultrasound, hysterosalpingography or hysteroscopy** are helpful.

### **d. Diffuse adenomyosis:**

- The patient is usually above 40 years, nullipara or of low parity.
- **Symptoms:** Dysmenorrhea, menorrhagia & leucorrhea.
- **Signs:** The uterus is symmetrically enlarged, firm & tender.
- **Ultrasound** is helpful.

### **e. Subinvolution:**

- The patient is recently delivered.
- **Symptoms:** Bleeding after delivery i.e. 2ry post-partum hemorrhage.
- **Signs:** The uterus is symmetrical & larger than expected
- **Ultrasound** is helpful to exclude retained products of conception.
- **Curettage:** removes retained products & excludes choriocarcinoma.



#### **f. Malignant tumors:**

- **Symptoms:** Post-menopausal bleeding is the commonest symptom.
- Bleeding related to pregnancy event in choriocarcinoma.
- **Signs:** Examination is done to evaluate the extent of the disease.
- **Fractional curettage** is essential.

#### **g. Pyometra:**

- **Symptoms:** Lower abdominal pain & fever.
- **Signs:** The uterus is symmetrically enlarged & tender.

#### **h. Hematometra due to cervical stenosis or atresia:**

- **Symptoms:** Amenorrhea & recurrent lower abdominal pain every month.
- **Signs:** The uterus is symmetrically enlarged.
- In cervical atresia there is failure to pass a sound.

### **Causes of tubal swelling**

- Tubal pregnancy.
- Hydrosalpinx and pyosalpinx.
- Endometriosis of the tube is rare.
- Malignant tumor of the fallopian tube which is very rare.

### **Adnexal mass**

- **Ovary:**
  - Neoplastic & non neoplastic ovarian swellings
  - Ovarian endometriosis
  - Ovarian pregnancy
- **Tube:**
  - EP
  - Hydrosalpinx, pyosalpinx
  - Tumors
- **Broad ligament**
  - Fibroids
  - Paraovarian cysts
- **Uterus:**
  - Pregnancy in a bicornuate horn.
  - Pedunculated subserous fibroid.

- **Others**

- Tumors of sigmoid colon
- Diverticular mass
- Pelvic kidney
- Retroperitoneal swellings

## Causes of hematosalpinx

- Tubal endometriosis
- Tubal pregnancy
- Complications of tubal neoplasms
- Torsion of hydrosalpinx
- Cryptomenorrhea

## Hemorrhage in The Ovary

1. Hemorrhage in a follicular or corpus luteum cyst
2. Hemorrhage in a benign neoplastic cyst of the ovary.
3. Hemorrhage in a malignant tumor.
4. Chocolate cyst
5. Ovarian pregnancy

## Cystic adnexal Swelling

- 1- Ovarian cysts.
- 2- Hydrosalpinx, pyosalpinx or hemotosalpinx.
- 3- Broad ligament cyst, hematoma or abscess.

## Low backache

A. gynecological causes:	B. non-gynecological causes
<ul style="list-style-type: none"> <li>▪ Pelvic adhesions.</li> <li>▪ Inflammatory e.g. chronic salpingitis.</li> <li>▪ Neoplasms: uterine fibroids</li> <li>▪ Advanced pelvic cancer</li> <li>▪ Endometriosis</li> <li>▪ Uterine prolapse.</li> <li>▪ Varicosities of the veins of the broad ligament</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rectal lesion e.g.: anal fissure</li> <li>▪ Musculo-skeletal pain.</li> <li>▪ Pregnancy due to exaggerated lordosis and relaxation of the ligaments.</li> </ul>

⇒ **Backache due to genital lesion shows the following**

- It's sacral or lumbo-sacral.
- It's diffuse: not indicated by the finger
- Usually in the midline
- It's not associated with local tenderness.

## **Causes of Cervical Enlargement**

- Congenital elongation of the portio-vaginalis of the cervix.
- Cervical congestion due to prolapse, pregnancy or pelvic congestion.
- Acute & chronic cervicitis.
- Neoplastic e.g. fibroid or malignant neoplasms
- Endometriosis of the cervix.
- Cervical ectopic pregnancy or cervical abortion.

## **Contact Bleeding**

- Bleeding following PV examination, sexual intercourse or douching
- **Causes**
  - Cervical erosion especially the papillary type as it is usually vascular.
  - Carcinoma, ulcers or polypi of the cervix or vagina
  - Uterine polyps that bulge in the vagina
- **Diagnosis**: See diagnosis of cervical cancer
- **Treatment** of the cause

## **Acute pelvic pain**

- 1- **Rupture**: ovarian cyst, tube, uterus
- 2- **Torsion**: fibroid. ovarian cyst, tube & ovary.
- 3- **Degeneration**: fibroid
- 4- **Distension**: pyometra, hemorrhage into a cyst or acute urinary retention
- 5- **Inflammatory**: PID, UTI, appendicitis.
- 6- **Vascular**: mesenteric thrombosis, sickle crises, hemorrhages in a cyst.
- 7- **Obstruction**: intestinal or ureteric.



# Chronic pelvic pain

▪ **Definition:** it is pain > 6 months

▪ **Cause:**

I- Gynecologic	II- Non gynecologic
<ul style="list-style-type: none"> <li>○ <b>Cyclic:</b> <ul style="list-style-type: none"> <li>⇒ Dysmenorrhea,</li> <li>⇒ Cryptomenorrhea,</li> <li>⇒ Premenstrual tension.</li> </ul> </li> <li>○ <b>Acyclic:</b> causes of pelvic congestion,</li> <li>• <b>Chronic</b> inflammation</li> <li>• <b>Pelvic pathology e.g:</b> <ul style="list-style-type: none"> <li>⇒ Fibroid,</li> <li>⇒ Excessive estrogen stimulation,</li> <li>⇒ Psychological stress,</li> <li>⇒ Coitus interruptus,</li> <li>⇒ Chronic constipation.</li> </ul> </li> <li>○ <b>Laparoscopy</b> is a must</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Urinary:</b> <ul style="list-style-type: none"> <li>⇒ Urethritis ,cystitis ,</li> <li>⇒ Stones &amp; malignancy</li> </ul> </li> <li>• <b>Intestine:</b> <ul style="list-style-type: none"> <li>⇒ Chronic appendicitis</li> <li>⇒ Crohn's, ulcerative colitis</li> <li>⇒ Diverticulitis ,irritable bowel</li> <li>⇒ Constipation tumors</li> </ul> </li> <li>• <b>Musculoskeletal:</b> <ul style="list-style-type: none"> <li>⇒ Disc prolapsed</li> <li>⇒ Osteoarthritis</li> </ul> </li> <li>• <b>Systemic disease:</b> SLE</li> </ul>

III- Psychogenic: excluded by exclusion

IV- Idiopathic

▪ **Diagnosis of chronic pelvic pain:**

1- Characters of pain

Onset → acute or chronic	Duration → continuous or intermittent
Site → suprapubic or iliac	May be referred
Nature → colicky or aching	Relation to menses → cyclic or acyclic
Degree → mild or severe	other symptoms → Gyn, GIT, urinary

2- Physical examination: general/ abdominal/ pelvic/ rectal

3- Investigations:

- Laboratory: CBC, ESR, & urine analysis
- US, CT, MRI: pelvic masses or malignancy
- Doppler (colored)/Venography: pelvic vein diameters
- X – ray → plain on bone/ IVP/ barium enema
- Laparoscopy in unexplained cases: endometriosis, pelvic adhesions or varicose veins in the broad ligament.

4- Treatment:

- Treatment of the cause, glycerine ichthyol
- Psychotherapy for cases with psychogenic pain



## Pelvic congestion (Pelvic pain syndrome)

▪ **Definition:** pelvic congestion of uterus & ↑ varicosities of the broad ligament

▪ **Etiology:** True cause is unknown but may be due to:

- 1- Chronic inflammation
- 2- Excessive E stimulation
- 3- Any pelvic pathology
- 4- Chronic constipation, coitus interruptus
- 5- Psychological

▪ **Investigations:**

- **US:** large uterus, thick endometrium, cystic ovaries
- **Doppler:** pelvic varicosities
- **Pelvic venogram:** transcervical intramyometrial injection of Urograffin, the spread of dye in pelvic veins is seen by a fluoroscopic screen
- **Laparoscopy:** dilated veins may be seen in the broad ligament

▪ **Treatment:**

1-**Medical:**

- Inhibition of ovulation COC
- Large doses of progestins (provera 30 mg/d for 6 m)

2-**Surgical:** TAH + BSO ( in old, completed her family)

PEARLS IN  
OBSTETRICS  
&  
GYNECOLOGY

### **History, examination & investigations**

- The history usually is the single most important tool in obtaining a diagnosis.
- Some practitioners use a 4 digit parity system to designate the number of Term deliveries, Preterm deliveries, Abortuses, and Live births (TPAL system). e.g, G2 P1001 indicates gravidity = 2 (two pregnancies including the current one), Parity 1001 = 1 prior term delivery, no preterm deliveries, no abortuses, and 1 living.
- The 1<sup>st</sup> line of any obstetric presentation should include age, gravidity, parity, LMP, estimated gestational age, and chief complaint.
- In every pregnancy greater than 20 weeks gestation, the patient should be questioned about symptoms of **preeclampsia** (headaches, visual disturbances, dyspnea, epigastric pain, and face/hand swelling).
- The **vaginal examination** assesses the anterior pelvis, where as the rectal examination is directed at the posterior pelvis.
- **Sonohysterography** is a special ultrasound examination of the uterus that involving injecting a small amount of fluid into the endometrial cavity to better define the intrauterine cavity. It can help to identify endometrial polyps or submucous myomas.
- The 1<sup>st</sup> step in clinical problem solving is making a **diagnosis**.
- The 2<sup>nd</sup> step is establishing the severity or stage of disease. There usually is prognostic or treatment significance based on the stage.
- The 3<sup>rd</sup> step is, for most conditions, tailoring the treatment to the extent or stage of the disease.
- The 4<sup>th</sup> step is monitoring treatment response or efficacy, which may be measured in different ways. It maybe symptomatic (patient feels better), or based on physical examination (fever), a laboratory test result (CA-125 level), or an imaging test (ultrasound size of ovarian cyst).

### **Physiology of pregnancy**

- In a normal pregnancy,  $\beta$ -hCG levels approximately double every 48 hours.
- A woman with a history of a child with a neural tube defect needs 4 mg of folic acid prenatally, but those without such a history need only 400 mcg.
- Advanced maternal age is associated with  $\uparrow$  chromosomal abnormalities,  $\uparrow$  1<sup>st</sup> trimester losses, and  $\uparrow$  risk of most obstetric complication.
- An increase in plasma volume that is greater than the increase in red blood cell mass causes the dilutional physiologic anemia of pregnancy.
- Pregnancy is a hypercoagulable state ( $\uparrow$  clotting factors & venous stasis)

- To ↓ group B streptococci neonatal sepsis, the CDC recommends maternal screening for the bacteria via vaginal & rectal cultures in the late 3<sup>rd</sup> trimester & prophylaxis with antibiotics in labor for those who test +ve.
- The non fasting 1 hour, 50 g glucose tolerance test is used to screen for gestational DM, & the fasting 3 hour, 100 g glucose tolerance test confirms the diagnosis.
- Nausea and vomiting of pregnancy typically begin around the fourth to the seventh week and end by the twelfth week.
- There is no safe level of alcohol consumption in pregnancy; the best advice is not to drink alcohol at all.
- The discriminatory zone is the  $\beta$ -hCG level at which an intrauterine pregnancy should be seen on ultrasound.
- Gestational dating is done using the crown-rump length in the 1<sup>st</sup> trimester and biparietal diameter, head circumference, femur length, and abdominal circumference in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters.
- HCG is made by the Syncytiotrophoblast to maintain the corpus luteum production of progesterone.
- Cardiac output increases in pregnancy, first by increased stroke volume, then by increased heart rate.
- The most common cause of abnormal serum screening is wrong dates.
- The next step in the evaluation of abnormal trisomy screening is the basic ultrasound.
- Up to 95 % of neural tube defects are detectable by targeted sonography.
- Approximately 60 % of Down syndrome cases are detected by the triple screen with an elevated human chorionic gonadotrophin, low maternal serum  $\alpha$ -fetoprotein, and low unconjugated estriol levels.
- The Quad screen using the additional marker of inhibin A adds an incremental sensitivity of 7 to 11 %.
- An elevated maternal serum  $\alpha$ -fetoprotein suggests a neural tube defect, but there are many other etiologies.

### **Anemia:**

- The most common cause of anemia in pregnancy is iron deficiency.
- For mild anemias, it is acceptable to initiate a trial of iron supplementation and reassess the hemoglobin level.
- The most common cause of megaloblastic anemia in pregnancy is folate deficiency.
- Hemolysis in individuals with glucose-6-phosphate dehydrogenase deficiency may be triggered by sulfonamides, nitrofurantoin, or antimalarial agents.



### **Bleeding in early pregnancy**

- When the HCG level is above the threshold and no intrauterine pregnancy is seen on transvaginal ultrasound, the patient most likely has an ectopic pregnancy.
- Early in the course of a normal intrauterine pregnancy, the  $\beta$ -HCG level should rise by at least 66% over 48 hr.
- The presence of a true intrauterine gestational sac on ultrasound makes the risk of ectopic pregnancy very unlikely.
- Surgery usually is the best therapy for the patient with an early pregnancy who is hypotensive or has severe adnexal pain.
- When a pregnant woman has an open cervical os with uterine cramping and history of passage of tissue, she usually has an incomplete abortion, best treated by uterine curettage.
- The typical history of a complete abortion is resolution of cramping and vaginal bleeding following passage of tissue, and the finding of a small firm uterus and a closed cervical os.
- The most common cause of a 1<sup>st</sup> trimester miscarriage is a fetal karyotypic abnormality.
- Incompetent cervix, which is suspected with painless cervical dilatation, is best treated with a cervical circlage.
- A molar pregnancy is unusual type of pregnancy characterized by vaginal spotting, absence of fetal heart tones, and size greater than dates. The diagnosis is made by sonography.
- Levels of HCG that plateau in the 1<sup>st</sup> 8 weeks of pregnancy indicate an abnormal pregnancy, which may be either a miscarriage or an ectopic pregnancy.
- The classic triad of ectopic pregnancy is amenorrhea, abdominal pain & vaginal spotting.
- When the quantitative hCG level exceeds 1500 to 2000 mIU/mL and the transvaginal sonogram does not show an intrauterine gestational sac, then the risk of ectopic pregnancy is high.
- The most common cause of hemoperitoneum in early pregnancy is ectopic pregnancy.
- A ruptured corpus luteum can mimic an ectopic pregnancy.
- The bacteria involved in septic abortion usually are polymicrobial, particularly anaerobes that have ascended from the lower genital tract.
- Hemorrhage often complicates the curettage for septic abortion.
- Treatment of septic abortion consists of maintaining blood pressure; monitoring blood pressure, oxygenation, & urine output; antibiotics; and uterine evacuation.

- When no chorionic villi are found on uterine curettage of a pregnant woman, the most likely etiology is ectopic pregnancy.
- Methotrexate inhibits DNA synthesis due to its interference with folate metabolism.
- A relative contraindication to methotrexate use is an ectopic pregnancy larger than 3.5 cm or the presence of fetal cardiac activity in the tube.
- 15-20 % of clinically recognized pregnancies end in miscarriage, but this risk is decreased to 6-8 % once embryonic cardiac activity is seen.
- Most common type of chromosomal abnormality in abortions is autosomal trisomies, but the single most common karyotype is monosomy X.
- Patients with ectopic pregnancies usually present with abdominal pain and abnormal vaginal bleeding.

### **Bleeding in late pregnancy**

- The usual management of placenta accreta is hysterectomy.
- Placenta accreta is associated with a defect in the decidua basalis.
- The risk of placenta accreta increases in women in a prior uterine incision and placenta previa. The greater the number of cesarean deliveries, the higher the risk of accreta.
- Low lying or marginal placenta previa diagnosed in the 2<sup>nd</sup> trimester often will resolve later in pregnancy, so repeat sonography is prudent.
- Painless antepartum vaginal bleeding suggests the diagnosis of placenta previa.
- Ultrasound is the diagnostic test of choice in assessing placenta previa and should be performed before digital or speculum examination.
- Cesarean section is the best route of delivery of placenta previa.
- Placenta previa in the face of prior cesarean deliveries increases the risk of placenta accreta.
- Painful antepartum bleeding should make one suspicious of placental abruption.
- The major risk factors for abruption placenta are hypertension, trauma, and cocaine use.
- Concealed abruption may hide significant bleeding without external hemorrhage.
- The most common cause of antepartum bleeding with Coagulopathy is abruption placenta.
- Placental abruption may lead to fetal to maternal hemorrhage.
- Placenta abruption and stillbirth occur in 8 % of pregnant cocaine users.
- Placenta previa classically presents as painless 3<sup>rd</sup> trimester vaginal bleeding, but placental abruption presents as painful 3<sup>rd</sup> trimester vaginal bleeding.

### **Cardiac diseases with pregnancy**

- Women with cardiac valvular disease and ventricular septal defects should receive subacute bacterial endocarditis prophylaxis at time of vaginal delivery.
- Treatment of asthma in pregnancy is essentially as in non pregnant women.
- PO<sub>2</sub> less than 80 mmHg in a pregnant woman is abnormal.

### **DM with pregnancy**

- If a woman has a history of gestational diabetes, her life time risk of developing type 2 diabetes is 36 %.
- To decrease the malformation risk in patients with insulin dependent diabetes mellitus, good glycemic control should be achieved prior to conception.

### **Hypertension with pregnancy**

- In general treatment of preeclampsia at term is magnesium sulfate & delivery.
- The management of preeclampsia in preterm pregnancy is observation until sever criteria are noted or term gestation is reached.
- The most common cause of significant proteinuria in pregnancy is preeclampsia.
- Magnesium sulfate is the best anticonvulsant to prevent eclampsia.
- The first sign of magnesium toxicity is loss of deep tendon reflexes.
- Chronic hypertension is diagnosed when a pregnant woman has hypertension prior to 20 weeks gestation or if the hypertension persists beyond 12 weeks postpartum.
- There is no method proven to prevent preeclampsia, and the only cure is delivery.
- Magnesium sulfate is given to preeclamptic woman during labor and for 24 hours after delivery to prevent seizures.

### **Thyroid diseases with pregnancy**

- Graves' disease is the most common cause of hyperthyroidism in pregnancy. Thyroid storm should be considered when CNS dysfunction and autonomic instability are present.
- Treatment of thyroid storm in pregnancy includes propylthiouracil, steroids, and  $\beta$ -blocker.
- Pregnancy (or use of estrogens) causes total thyroxin to be increased, free thyroxin to be unchanged, thyroid-stimulating hormone to be unchanged, and thyroid binding globulin to be increased.
- Postpartum thyroiditis often occurs 1 to 4 months postpartum, is associated with antimicrosomal antibodies, and can lead to hypothyroidism.

- Circulating  $T_4$  and  $T_3$  increase in pregnancy 2ry to increased thyroid binding globulin, but free levels are unchanged.

### **Renal diseases with pregnancy**

- The most common cause of septic shock in pregnancy is pyelonephritis.
- When dyspnea occurs in pregnant woman who is being treated for pyelonephritis; ARDS should be considered.
- Endotoxin release from gram negative bacteria is the cause of ARDS associated with pyelonephritis.
- During pregnancy, increased renal plasma flow and increased glomerular filtration rate lead to decreased serum BUN and creatinine.
- Pregnancy ↑the risk of pyelonephritis due to anatomic changes, changes in urine content, and increased progesterone affecting urethral motility.

### **DVT with pregnancy**

- The physical examination is not very useful for assessment of DVT.
- Venous duplex sonography is an accurate method for diagnosing DVT.
- After a DVT or pulmonary embolism is diagnosed, anticoagulation is indicated.
- The most common locations for DVT after gynecologic surgery are the lower extremities and the pelvic veins.
- The diagnosis of pulmonary embolism is suspected in a patient with dyspnea, a clear chest radiograph, and hypoxemia. It is confirmed with imaging tests such as ventilation perfusion scan or spiral computed tomography scan.
- The most common presenting symptom of pulmonary embolism is dyspnea.
- The most common cause of maternal mortality is embolism (both thromboembolic and amniotic fluid embolism).
- Anticoagulation is the best treatment of DVT or pulmonary embolism.
- Pulmonary embolism is the leading cause of maternal mortality in the U.S.

### **Infections with pregnancy**

- The most common cause in generalized pruritis in pregnancy in the absence of skin lesions is cholestasis in pregnancy.
- The lesions of pruritic urticarial papules and plaques of pregnancy usually begin on the abdomen and spread to the thighs and sometimes the buttocks and arms.
- Chlamydia can cause conjunctivitis or pneumonia in a neonate.
- Ophthalmic antibiotics administered to the neonate help to prevent gonococcal disease but not chlamydial conjunctivitis.
- The best treatments of chlamydial cervicitis in pregnancy are erythromycin, azithromycin, and amoxicillin.



- Parvovirus infection in pregnancy can cause fetal anemia leading to hydrops fetalis.
- Maternal parvovirus infection can lead to fetal anemia, hydrops, and even IUFD.
- Women with active HSV at the time of delivery should undergo C.S. to prevent neonatal transmission.

### **Preterm labor**

- Dyspnea occurring in a woman with preterm labor and tocolysis usually is due to pulmonary edema.
- The cornerstones of managing preterm labor are identifying the cause, giving steroids (if gestation is at 24-34 weeks), and tocolysis.
- The most common cause of neonatal morbidity in a preterm infant is respiratory distress syndrome.
- A negative cervical fetal fibronectin assay virtually guarantees no delivery within 1 week.

### **Labor**

- One of the most common causes of inverted uterus is undue traction on the cord when placenta has not yet separated.
- The signs of placental separation are:
  - 1) Gush of blood.
  - 2) Lengthening of the cord.
  - 3) Globular shaped uterus.
  - 4) Uterus rising to the anterior abdominal wall.
- Hemorrhage is a common complication of an inverted uterus.
- The upper limit for normal for the 3<sup>rd</sup> stage of labor (time between delivery of the infant to delivery of the placenta) is 30 min.
- The normalcy of labor is determined by assessing the cervical change versus time. Normal labor should be observed.
- Cesarean delivery (for labor abnormalities) in the absence of clear cephalopelvic disproportion is generally reserved for arrest of active phase with adequate uterine contractions.
- Adequate uterine contractions is not a precise definition but is commonly judged as greater than 200 Montevideo units with an initial uterine pressure catheter or by uterine contractions every 2 to 3 min, firm on palpation, and lasting at least 40 to 60 sec.
- In general, latent labor occurs when the cervix is dilated less than 4 cm and active labor when the cervix is dilated more than 4 cm.
- The stages of labor are stage one (onset of contractions to complete dilatation), stage two (complete dilatation to delivery of fetus), and stage three (delivery of fetus to delivery of placenta).

- The cardinal movements of labor are engagement, descent, flexion, internal rotation, extension, external rotation, and expulsion.
- The most common complication of C.S. is infection, namely endometritis.
- The main complication of vaginal birth after C.S. is uterine rupture, and the level of risk depends on the type of previous uterine incision.

### **Shoulder dystocia**

- Shoulder dystocia cannot be predicted or prevented in the majority of cases.
- The biggest risk factor for shoulder dystocia is fetal macrosomia particularly in a woman who has gestational D.M.
- Estimation of fetal weight is most often inaccurate, as is the diagnosis of macrosomia.
- The most common injury to the neonate in a shoulder dystocia is brachial plexus injury, such as Erb's palsy.
- The 1<sup>st</sup> actions for shoulder dystocia are generally the McRobert's maneuver or suprapubic pressure.
- Fundal pressure should not be used once shoulder dystocia is encountered.

### **Postpartum hemorrhage**

- The most common cause of PPH is uterine atony. Thus, the 1<sup>st</sup> step in patient assessment and management is uterine massage to check if the uterus is boggy.
- If the uterus is firm and the woman is still bleeding, then the clinician should consider a genital tract laceration.
- The most common cause of late PPH (after 1<sup>st</sup> 24 hr) is subinvolution of the uterus.
- Hypertensive disease is a contraindication for ergot alkaloids, and asthma is a contraindication for prostaglandin F<sub>2α</sub>.
- PPH is loosely defined as blood loss greater than 500 cc for a vaginal delivery and 1000 cc for a C.S.
- The most common cause of PPH is uterine atony.

### **Puerperium**

- Postpartum blues in 50-80 % of women, depression in 8-15 %, and psychosis in 1-2/1000.
- Special considerations for general anesthesia in the pregnant woman include aspiration risk physiologic respiratory changes, IVC compression by gravid uterus, and hypercoagulability.
- Initial evaluation of a pregnant trauma patient is the same as in the nonpregnant woman; stabilize the mother before evaluating the fetus.
- Perimortem C.S. should be done after 4 minutes of CPR in a pregnant woman.

- Abnormal placental development may occur over the internal cervical os (previa), attached to the myometrium (accreta), into the myometrium (incretta), or through the myometrium (percreta).
- Even after 2 consecutive mid-trimester losses due to premature cervical dilation, women have a 70-75 % chance of carrying the next pregnancy to term.
- Cervical cerclage is indicated for treatment of cervical incompetence, but its benefit is still controversial.
- The most common cause of postpartum fever is endometritis, and the greatest risk factor for this infection is C.S.
- In pregnancy, the appendix moves superiorly and laterals from the normal location.
- Acute onset of colicky abdominal pain is typical of ovarian torsion.
- With ovarian torsion the clinician can untwist the pedicle and observe the ovary for viability.

### **Operative**

- Urethral injury should be suspected when a patient develops flank tenderness and fever after a hysterectomy or oophorectomy.
- Meticulous urethral dissection can lead to devascularization injury to the ureters.
- A fistula should be considered when there is constant leakage of drainage from the vagina.
- Intravenous pyelogram is the imaging test of choice to assess a post operative patient with a suspected urethral injury.

### **Fetology**

- The 1<sup>st</sup> steps in assessing fetal bradycardia after artificial ROM are distinguishing the fetal heart rate from the maternal pulse and examining the vagina to assess for cord prolapse.
- The best therapy for umbilical cord prolapse is elevation of the persisting part and emergency cesarean delivery.
- The risk of cord prolapse with vertex presentation or flank breech or transverse lie is substantially higher.
- The most common finding with uterine rupture is a fetal heart rate abnormality.
- The best treatment of suspected uterine rupture is immediate cesarean delivery.
- Preterm labor and delivery are much more common in multiple gestations; in fact, mean gestational length for twins is 35 weeks; for triplets, 33 weeks; and for quadruplets, 31 weeks.

- Twin to twin transfusion syndrome of monozygotic pregnancies occurs due to a placental vascular anastomosis between the fetuses.
- Fetal hemolytic disease can occur if the mother produces antibodies against fetal red blood cell antigens.
- RhoGAM, which is anti-D immunoglobulin, is given to Rh-negative women at 28 weeks, at other times when fetomaternal hemorrhage may occur, and postpartum if the newborn is Rh-positive.
- The baseline risk of congenital anomalies is 2-3 %.
- The most common autosomal disorders are trisomy 21 in live births, trisomy 18 in stillbirths, and trisomy 16 in the 1<sup>st</sup> trimester losses.
- Although IUGR is defined as estimated fetal weight less than the 10<sup>th</sup> percentile, most adverse perinatal outcomes occur at less than the 5<sup>th</sup> percentile.
- Fetal urine is the major source of amniotic fluid production while fetal swallowing is the major mode of resorption.
- The majority of cases of Polyhydramnios are idiopathic followed by maternal diabetes.
- PROM is confirmed by pooling, positive nitrazine test, and ferning of vaginal fluid.
- External cephalic version is a technique where one or two people attempt to maneuver a fetus from breech to cephalic presentation.
- Non stress tests assess fetal heart rate baseline, variability, and accelerations and are part of antepartum fetal surveillance to detect fetuses at risk 2ry to uteroplacental insufficiency, but non stress test cannot predict sudden events.
- Intrapartum fetal heart rate monitoring has decreased the number of intrapartum fetal deaths, but it has increased the number of C.S. without changing the rate of the long term neurologic sequel or cerebral palsy.
- Decelerations are characterized based on timing with contractions- early (head compression), late (uteroplacental insufficiency), and variable (cord compression).
- As in the adult, neonatal resuscitation utilizes the ABCs (airway, breathing, and circulation)
- Lithium, a common treatment of bipolar disorder, has been associated with cardiac malformations, especially Ebstein's anomaly, but the extent of the risk is unclear.
- The most common chromosomal abnormality in miscarriages is autosomal trisomies, but the single most common karyotype is monosomy X.
- Hydramnios is one of the earliest manifestations of fetal hydrops.
- Some causes of hydramnios include gestational diabetes, isoimmunization, syphilis, fetal cardiac arrhythmias, and fetal intestinal atresia.



- The risk of congenital anomalies is 2-3 times higher than baseline in women on anticonvulsants, but the risk is increased above baseline even in women with epilepsy not on medications.
- Possible fetal effects of SLE include congenital heart block & NN lupus.
- Pregnancies complicated by PROM after 34 or 35 weeks gestation usually are managed by induction of labor.
- PPROM of less than 32 weeks gestation usually are managed expectantly.
- The earliest sign of Chorioamnionitis is fetal tachycardia.
- PPROM & Chorioamnionitis should be treated with broad spectrum antibiotics (e.g., ampicillin and gentamycin) & delivery.

### **MMR:**

- The most common cause of mortality in women younger than 20 years is a motor accident (in USA).
- The most common cause of MMR in ♀ > 39 years is cardiovascular disease.
- Major conditions in women aged 65 years and older include osteoporosis, heart disease, breast cancer, and depression.

## **Pearls in gynecology**

### **Physiology:**

- Midcycle surge of LH predicts impending ovulation.
- Premenstrual syndrome is defined as the emotional and physical symptoms that occur at the same time prior to the menstrual cycle each month.
- There are no diagnostic criteria for polycystic ovarian syndrome (PCOS), but common findings include increased LH:FSH ratio, decreased fasting glucose: insulin ratio, polycystic ovaries on ultrasound, hirsutism, and obesity.
- All pelvic pain is not gynecologic in origin.
- Phases of sexual response cycle are excitement, plateau, orgasm & resolution.
- Vaginismus is often associated with a history of sexual abuse or trauma.

### **Menopause:**

- Hot flushes and irregular menses after age 45 years are most likely due to the climacteric, and the symptoms usually respond to the estrogen replacement therapy.
- The current indication for ERT in the menopausal women is significant vasomotor symptoms, and it should be used for the shortest duration feasible.
- Weight bearing exercise, Ca and Vit D supplementation, and ERT are the important cornerstones in the prevention of osteoporosis.
- Progestin should be added to ERT when a woman has her uterus, to prevent endometrial cancer.
- Continuous estrogen-progestin therapy may be associated with a small but significant risk of cardiovascular disease and breast cancer.
- An endometrial sample should be performed in a woman with post menopausal bleeding to assess for endometrial carcinoma.

- Unopposed estrogen is generally the biggest risk factor for development of endometrial cancer.
- Endometrial cancer is staged surgically, and surgery is a fundamental part of its treatment.
- Persistent post menopausal bleeding warrants further investigations even after a normal endometrial sampling.
- Ovarian failure is normal at menopause (average 51 years old) and premature at > 40 years; it requires work up in women < 30 years old.
- Symptoms of menopause include irregular then absent menses, hot flushes, and vaginal atrophy or dryness.

### **Amenorrhea**

- The 2 most common causes of 2ry amenorrhea after PPH are Sheehan's syndrome and intrauterine adhesions.
- A pregnancy test should be the 1<sup>st</sup> test in evaluating a woman with 2ry amenorrhea.
- Normal function of the anterior pituitary points towards intrauterine adhesions.
- Hypothyroidism or a monophasic basal body temperature chart suggests Sheehan's syndrome.
- Treatment of Sheehan's syndrome is replacement of the hormones governed by the anterior pituitary gland.
- The most common cause of ovulatory dysfunction in a reproductive age woman is polycystic ovarian syndrome, which is characterized by obesity, anovulation, hirsutism, glucose intolerance, and estrogen excess.
- The most common cause of 2ry amenorrhea after uterine curettage is intrauterine adhesions.
- Intrauterine adhesions are diagnosed by hysterosalpingogram and confirmed by hysteroscopy.
- Hysteroscopic resection is the best treatment of intrauterine adhesions.
- Uterine curettage, especially associated with pregnancy, is a risk factor for intrauterine adhesions.
- A pregnancy test should be the 1<sup>st</sup> test with any female with 1ry or 2ry amenorrhea.
- The 2 most common causes of 1ry amenorrhea in a woman with normal breast development are androgen insensitivity and Mullerian agenesis.
- Scanty pubic and axillary hair suggest androgen insensitivity.
- A karyotype and testosterone level help to differentiate between Mullerian agenesis and androgen insensitivity.
- Renal anomalies are common with Mullerian abnormalities.
- The most common cause of 2ry amenorrhea is pregnancy.
- The 2 syndromes that are characterized by breast development and the absence of a uterus, androgen insensitivity and Mullerian agenesis, can be differentiated by a karyotype.

- In females, the order of puberty is thelarche, pubarche, maximum growth velocity, and menarche.
- The 3 most common causes of 1ry amenorrhea are gonadal dysgenesis, Mullerian agenesis, and androgen insensitivity.

### **Infertility:**

- The 5 basic factors causing infertility are; Ovulatory, uterine, tubal, male, and peritoneal.
- Irregular menses usually means irregular ovulation; regular menses usually indicates regular ovulation. In general, ovulatory disorders are fairly amenable to therapy.
- A history of salpingitis or chlamydial cervicitis suggests tubal factor infertility.
- Laparoscopy is the gold standard for diagnosis endometriosis, and lesions may have a Variety of appearances.
- Surgery is the main therapy for endometrial or tubal abnormalities associated with infertility.
- Tubal factor infertility should be suspected when a patient has a history of salpingitis, especially caused by chlamydial infection.
- The hysterosalpingogram is the initial test for assessing tubal patency.
- In general, an abnormal hysterosalpingogram is confirmed by laparoscopy.
- Distal tubal disease may be treated surgically with fimbrioplasty.
- Risks of ovulation induction include multiple gestation and ovarian hyperstimulation.
- Initial evaluation of an infertile couple should include basal body temperature chart to assess ovulation, semen analysis, hysterosalpingogram to check tubal patency, then postcoital test to evaluate cervical mucus.
- IVF, a procedure used to overcome tubal or male factor infertility, requires ovarian hyperstimulation with injectable gonadotrophins, egg retrieval, fertilization, and embryo transfer.

### **Endometriosis**

- Endometriosis, or endometrial tissue in the myometrium, causes menorrhagia and dysmenorrhea.
- Adenomyosis, or endometrial tissue in the myometrium, causes menorrhagia and dysmenorrhea.

### **Fibroid**

- The most common reason for hysterectomy is symptomatic uterine fibroid.
- The most common symptom of uterine fibroid is menorrhagia.
- Physical examination consistent with uterine leiomyomata is an irregular pelvic mass that is mobile, midline, and moves contiguously with the cervix.
- Leiomyosarcoma rarely arises from leiomyoma; rapid growth or history of prior pelvic irradiation should raise the index of suspicion.
- Significant growth in suspected uterine fibroids in postmenopausal women is unusual and generally requires surgical evaluation.

- Fibroid are estrogen sensitive, fibromuscular benign tumors that are thought to originate from a monoclonal cell line.

### **Cancers:**

- The main risk factor for cervical cancer are sexually related, especially exposure to human papilloma virus.
- HPV 16 & 18 are the most commonly types in cervical dysplasia & cancer.
- Flank tenderness and leg swelling indicate advanced cervical cancer, which is best treated by radiotherapy with a chemotherapeutic radiosensitizer.
- A visible lesion of cervix should be evaluated by biopsy and not Pap smear.
- An abnormal Pap smear usually is evaluated with colposcopic directed biopsies.
- Pap smear screening should be initiated approximately 3 yr after initiation of sexual activity or at age 21 yr, whichever occurs earlier.
- The most common ovarian tumor in a woman younger than 30 yr is a benign cystic teratoma (dermoid cyst). The best treatment of it is ovarian cystectomy.
- The most common ovarian tumor in a woman older than 30 yr is epithelial in origin, most commonly serous cystadenoma.
- An ovarian mass larger than 5 cm in a postmenopausal woman most likely represents an ovarian tumor and generally should be removed.
- During the reproductive yr, functional ovarian cysts are common and usually are smaller than 5 cm in diameter. Any ovarian cyst larger than 8 cm in a reproductive aged woman probably is a neoplasm and should be excised.
- CA125 is most specific for ovarian cancer in postmenopausal woman.
- Ascites is a common sign of ovarian malignancy.
- Vulvar cancer is predominantly squamous cell and spreads via lymphatics to superficial inguinal nodes.
- HPV can trigger genital dysplasia and is linked to invasive cervical cancers.
- The incidence of cervical cancer is ↓2ry to regular screening with Pap smears.
- Cervical cancer is staged clinically with exam under anesthesia, cystoscopy, and proctoscopy.
- Important risk factors for endometrial cancer include obesity, anovulation, and tamoxifen use.
- The most common symptom of endometrial cancer is bleeding.
- Sex cord and germ cell tumors are usually diagnosed early and are highly curable, while epithelial ovarian cancer presents late in the disease.
- Meig's syndrome mimics advanced stage ovarian cancer but actually involves benign ovarian fibroma with ascites and pleural effusion.
- Rapid onset of hirsutism or virilization usually indicates the presence of an androgen secreting tumor.
- The most common cause of hirsutism and irregular menses is PCO syndrome.
- The most common cause of ambiguous genitalia in the newborn is congenital adrenal hyperplasia.
- Hyperandrogenism in the face of an adnexal mass usually indicates a Sertoli-Leydig cell tumor of the ovary and is treated surgically.



## **Urinary incontinence:**

- The 1<sup>st</sup> treatment of genuine stress incontinence is surgical, where as the best treatment of urge incontinence is medical.
- Cystometric or urodynamic evaluation helps to differentiate genuine incontinence from urge incontinence.
- A postvoid catheterization showing a large residual volume suggests overflow incontinence.
- Loss of urine occurs when the intravesical pressure equals (or exceeds) the sphincter pressure.
- Stress incontinence is loss of urine due to increased intra-abdominal pressure, and urge incontinence is due to detrusor instability.
- Stress incontinence can be due to urethral hypermobility or less commonly, intrinsic sphincter deficiency.

## **Infections:**

- The 2 most common etiologies of mucopurulent cervical discharge are chlamydial infection.
- Gram-negative intracellular diplococci are highly suggestive of *N. gonorrhea*.
- Chlamydia often coexists with gonococcal cervicitis.
- Ceftriaxone treats gonorrhea, where as doxycycline or azithromycin treats chlamydial infections.
- The organisms responsible for salpingitis are polymicrobial, including gonorrhea, Chlamydia, anaerobes, and gram negative rods. Therefore, the antibiotic therapy must be broad spectrum.
- The classic clinical triad of PID is lower abdominal tenderness, cervical motion tenderness, and adnexal tenderness.
- Laparoscopy is the gold standard in the diagnosis of acute salpingitis, with the operator visualizing purulent drainage from the fallopian tube.
- Long term sequel of acute salpingitis includes chronic pelvic pain, ectopic pregnancy, and involuntary infertility.
- Cesarean delivery should be offered to a woman with a history of herpes simplex virus who has prodromal symptoms or suspicious lesions of the genital tract.
- Herpes simplex virus is the most common cause of infectious vulvar ulcers in the United States.
- The cervix, vagina, and vulva must be inspected carefully for lesions in a laboring patient with a history of herpes simplex virus.
- The most common cause of cystitis is *E. coli*.
- Bacteruria caused by group B streptococcus in pregnancy necessitates the use of intravenous penicillin or ampicillin in labor to decrease the risk of neonatal group B streptococcus sepsis.
- Pyelonephritis presents with flank tenderness and fever.
- Urethritis, commonly caused by Chlamydia or gonococcus, should be suspected with negative urine cultures and symptoms of a urinary tract infection.
- The ulcer of 1<sup>st</sup> syphilis is usually single and painless, While the ulcer of herpes is more often multiple and painful.

- Trichomoniasis and candidiasis are diagnosed by visualizing the organism on microscopy of vaginal discharge; bacterial vaginosis is diagnosed by the (whiff test) and the appearance of (clue cells).
- PID is often a polymicrobial infection but generally begins with infection with N.gonorrhea or C.trachomatis.
- The classic lesions of herpes simplex virus are a painful cluster of vesicles & ulcers, although atypical lesions, such as abrasions or fissures, or no lesion can occur.
- Acyclovir is indicated to suppress frequent recurrences during the year.
- 1ry herpes simplex virus is a systemic disease; recurrent herpes simplex virus is generally a local process.
- Often, infected women complain of neurologic symptoms, such as tingling, burning, or itching at the skin site, before vesicles break out.
- Syphilis of less than 1-year duration can be treated with a single intramuscular course of penicillin; infection of more than 1-year duration is treated by 3 courses of penicillin at 1 week intervals.
- The nontender ulcer with indurated edges is typical for the chancre lesion of 1ry syphilis. If serology is negative, then dark field examination is warranted.
- The best treatment of syphilis in pregnancy is penicillin.
- Pregnant women with syphilis and an allergy to penicillin should undergo penicillin desensitization and then receive penicillin.
- The 3 most common infectious vulvar ulcers are herpes simplex virus, syphilis, and chancroid.
- The 3 most common types of vaginal infections are Trichomoniasis, candidal vaginitis, and bacterial vaginosis.
- Candidal vulvovaginitis is a common infection in women who are pregnant, taking broad spectrum antibiotics, diabetic, or immunocompromised.
- Bacterial vaginosis is associated with preterm delivery, postpartum endometritis, and PID.
- Trichomonal vaginitis is associated with an intense inflammatory process and may induce punctuations of the cervix known as strawberry cervix.
- The cornerstones of treatment of septic shock include aggressive IV fluids, source control, antibiotic therapy, & monitoring perfusion & organ function.
- Source control in septic shock involving removing the etiology of the infection.
- The sunburn like rash & /or desquamation is typical for staphylococcus aureus.
- The initial antibiotic therapy for serious S.aureus infections is generally intravenous nafcillin or methicillin unless methicillin resistance is suspected, in which case vancomycin is used.
- Hypotension that persists despite IV isotonic fluid replacement generally requires pressor support, such as with intravenous infusion of dopamine.

### **Contraception:**

- Emergency contraception consists of high dose combination hormones or high dose progestin.
- Emergency contraception is effective when initiated within 72 hr of intercourse.
- The main side effects of combination hormonal emergency contraception therapy are nausea and vomiting.
- OCPs work primarily by inhibiting ovulation through suppression of LH and FSH.
- OCPs decrease the risk of ovarian and endometrial cancers.

ON THE SHOULDER OF  
GIANTS:

NAMES IN  
OBSTETRICS

&

GYNECOLOGY

## Eponyms & names in obstetrics and gynecology

### A

- **Alcock, Benjamin (b.1801):** Alcock's (pudendal) canal.
- **Apgar, Virginia (1909-1974):** Apgar score "assessment of neonates after delivery".
- **Arias-Stella, Javier (b.1924):** Arias-Stella reaction "atypical focal adenomatous hyperplasia."
- **Arnaux sign:** to auscultate F.H.S in case of multiple pregnancy.
- **Asherman, Joseph (1889-1968):** Asherman \$.
- **Auvard:** speculum "self-retaining posterior vaginal wall".
- **Aveling, James:** Aveling repositior
- **Ayre, James Ernest (1910-1965):** Ayre's spatula.

### B

- **Ballard, J L:** Ballard score "to assess neonatal gestational age".
- **Baldy John and Webster John:** Baldy-Webester uterine ventrosuspension
- **Ballantyne, John William:**
  - Antenatal care
  - Ballantyne operation for drainage of CSF in hydrocephalus associated with spina bifida
- **Bandl, Ludwig (1842-1892):** Bandl ring "pathological retraction ring".
- **Barnes, Robert (1817-1907), Neville, William (d.1904) & Simpson, James Young (1811-1870):** Barnes-Neville-Simpson forceps.
- **Barr, Murray Llewellyn (1908-1995):** Barr body.
- **Bartholin, Caspar (1655-1738):** Bartholin's gland.
- **Barton:** Barton's forceps
- **Basset:** Basset radical vulvectomy
- **Baudelocque, Jean-Louis (1746-1810):** Baudelocque's (external conjugate) diameter.
- **Bishop, Edward Harry (1913-1995):** Bishop Score "predicts the response to induct of labor".
- **Bonney, William Francis Victor (1872-1953):**
  - Bonney Myomectomy clamp.
  - Bonney Myomectomy screw.

- Bonney hood operation.
- Bonney (urethral elevation) test "without pressing the urethra" in SUI.
- **Brandt, Murray Lampel (b.1892) & Andrews, Charles James (b.1876):** method of placental delivery and modified Brandt- Andrews method "gentle uterine massage to deliver the placenta".
- **Brenner, Fritz (1887-1969):** Brenner's tumor.
- **Burch, John Christopher (1900-1977):** Burch colposuspension.
- **Burns, John William (1884-1950) and Marshall, Charles McIntosh (1901-1954):** Burns- Marshall Technique "for delivery of the after coming head of breech".

## C

- **Caldwell, William Edgar (1880-1943) & Moloy, Howard Carman (1903-1953):** Classification of female pelvis "gynecoid, android, anthropoid7 platypelloid".
- **Call, Emma Louise (1847-1937) & Exner, Siegmund (1846-1962):** Call-Exner bodies.
- **Carus, Carl Justav (1789-1869):** curve of Carus "anatomical axis of female pelvis (C shaped)".
- **Chadwick, James Read (1844-1905):** Chadwick's sign "edematous violet vagina with pregnancy".
- **Chamberlen, Peter: obstetric forceps**
- **Cloquet, Jules Germain (1790-1883):** lymph nodes of Cloquet.
- **Coombs, Robert Royston Amos (b.1921):** Coombs' test "diagnosis of sensitization due to Ag-Ab reaction in case of hemolytic anemia (direct: fetal. Indirect: mother) ".
- **Couvellaire, Alexander (1873-1892):** Couvellaire uterus "uteroplacental apoplexy (after sever abruption placenta)".
- **Crede, Carl Siegmund Franz (1819-1892):** Crede's method "downward compression on the fundus to deliver the placenta".
- **Cullen, Thomas Stephen (1868-1953):** Cullen sign (umbilical black eye) "bluish discoloration around the umbilical due to absorption of intraperitoneal He by periumbilical lymphatics".
- **Curtis, Arthur and Fitz-Hugh, Thomas: Curtis-Fitz-Hugh syndrome**



## *D*

- **DeLee, Joseph Bolivar**: prophylactic forceps delivery
- **Doderlein, Albert Siegmund Gustav (1860-1941)**: bacilli in the vagina
- **Donald, Archibald (1860-1937)**: Manchester repair.
- **Donald, Ian (1910-1987)**: Obst. U/S.
- **Doppler, Christian Andreas (1803-1853)**: "His 1<sup>st</sup> name is often incorrectly as Johann Christian but he was baptized Christian Andreas after St. Andreas on whose day he was born".
- **Douglas, James (1675-1742)**: Douglas pouch
- **Down, John Langdon (1828-1896)**: Down's \$ "trisomy 21".
- **Duhrssen, Alfred**: Duhrssen's cervical incisions
- **Duncan, James Matthews (1826-1890)**: Duncan mechanism "of placental separation (by its side) 20% of placental deliveries".

## *E*

- **Erb, Wilhelm Heinrich**: Erb's palsy
- **Esbach, Georges H.(1843-1890)** Esbach reagent (albuminometer) "quantitative estimation of albuminuria".

## *F*

- **Fallopus, Gabriel (1523-1562)**: fallopian tubes.
- **Ferguson, James Kenneth Wallace (b. 1907)**:
  - Ferguson's reflex "good application of the head on cervix will induce neuro-endocrinal reflex".
  - Ferguson speculum
- **Fitz- Hugh, Thomas (1894-1963) & Curtis, Aethur Hale (1881-1955)**: Fitz- Hugh & Curtis \$ "perihepatitis in a woman with a history of Gonococcal or chlamydial salpingitis".
- **Fothergil, William Edward (1865-1926)**: Forthergil operation (in prolapse).
- **Friedman, Emanuel A.**: Friedman curve "normal progress of labour (by partogram)".

## *G*

- **Gartner, Hermann Treschow (1785-1827):** Gartner's ducts.
- **Gilliam, David:** Gilliam's uterine ventrosuspension
- **Goodell, William (1829-1894):** Goodell's sign "edematous violet cervix with pregnancy".
- **Graaf, Rengier de (1641-1673):** Graafian follicles.
- **Graves:** speculum.

## *H*

- **Halban, Josef (1870-1937):**
  - Halban's theory of endometriosis.
  - Halban operation for enterocele
  - Halban disease (persistent CL)
- **Hartmann:** Hartmann pregnancy "one of the implantation bleeding, when bleeding occurs from the site of implantation & misinterpreted as menstrual bleeding. It is a benign condition with no complications only errors in calculating the GA & EDD".
- **Hegar, Alfred (1830-1914):**
  - **Hegar's dilators** "used during D & C – diagnosis of patulous os in non-pregnant".
  - **Hegar's sign** "feeling the compressible isthmus + soft uterus in the 1<sup>st</sup> 8 weeks of pregnancy".
- **Hellin's rule:** for the incidence of multiple pregnancy.
- **Hesselbach, Franz Kasper (1759-1816):** Hesselbach triangle "in laproscopic surgeries".
- **Hicks, John Braxton (1823-1897):** Braxton-Hicks contraction "uterine contractions in the last 6-8 weeks of pregnancy".
- **Hinselmann, Hans (1884-1959):** colposcopy.
- **Huhner, Max:** postcoital test

## *J*

- **Jacquemir, Etienne Joseph (1796-1872):** Jacquemir's sign "edematous violet vulva with pregnancy".

## K

- **Kennedy Karman:** cannula "used to aspirate the uterine contents to induce abortion".
- **Kegel, Arnold Henry:** Kegel's exercises.
- **Kelly:** anterior repair
- : sutures for urethrocele
- **Kerr, Munro:** LSCS, text book for operative obstetrics
- **Kielland, Christian Casper Gabriel (1871-1941):** Kielland forceps "in malpresentations".
- **Kleihauer, enno (b.1927) & Betke, Klaus Hermann (b.1914):** Kleihauer- Betke test "acid elution test".
- **Koblet:** tubules (remnants of pronephros)
- **Kristeller, Samuel (1820-1900):** Kristeller's maneuver "supra-pubic pressure to increase flexion of the after coming head".
- **Krukenberg, Friedrich Ernst (1871-1946):** Krukenberg's tumor.

## L

- **Landsteiner, Karl:** blood groups.
- **Langhans, Theodor (1839-1915):** Langhans' layer (cytotrophoblast).
- **Latzko, Wilhelm (1863-1945):** repair of vesicovaginal fistula.
- **Lefort, Leon Clement (1829-1893):** Lefort operation.
- **Leopold, Christian Gerhard (1846-1912):** Leopold's maneuvers "fundal and umbilical grips".
- **Liley, Albert William (1929-1983):**
  - Chart (or zones) "assessing the severity of Rh isoimm. Using optical density of bilirubin".
  - Intrauterine fetal transfusion.
- **Lippes, Jack (b.1924):** Lippes' loop.
- **Litzmann, Karl Conrad Theodor (1815-1890):** Litzmann's obliquity "anterior asynclitism (posterior parietal bone presentation)".
- **Lovest, Jorgen (1896-1981):** Lovest maneuver "to deliver the shoulder in breech presentation".
- **Lugol, Jean Guillaume Auguste (1788-1851):** iodine
- **Lynch, Henry T.:**
  - Sutures for management of atonic uterus via compressing brace suture.

- Lynch II \$ “adenocarcinoma in many organs (stomach-colon-ovary-breast...etc) which runs in families”.

## *M*

- **Mackenrodt, Alwin Karl (1859-1925):** Mackenrodt`s ligament.
- **Malmstrom:** ventouse
- **Manning, F.A.:** biophysical profile.
- **Marshall, Victor Fray (b.1913): Marchetti, Andrew Anthony (1901-1970) & Krantz, Kermit Edward (b.1923):** Marshall- Marchetti- Krantz operation.
- **Maurceau, Francois (1637-1709): Smellie, William (1697-1763) & Veit** Maurceau-(*Smellie-Veit*) maneuver “*delivery of the after coming head in breech (jaw flexion and shoulder traction)*”.
- **McCall:** vaginal culdoplasty
- **McDonald, Ian Alexander (1922-1950):**  
McDonald`s rule: for calculation of E.D.D. from the symphysiofundal height after 24 weeks.  
McDonald`s circlage: transvaginal cerclage.
- **McRoberts, William Alexande (b.1914):** McRobert`s maneuver “increase flexion of maternal hips to deliver the fetus in shoulder dystocia”.
- **Meigs, Joe Vincent (1892-1963):** Meigs` \$.
- **Mendelson, Curtis Lester (b.1913):** Mendelson (pulmonary acid aspiration) \$ (aspiration of stomach content associated with general anesthesia in pregnancy) 1/30.000.
- **Meyer-Mink:** non-stress test.
- **Meyer, Robert (1864-1947):** Meyer`s theory of endometriosis.
- **Montgomery, William Fetherston (1797-1859):** Montgomery tubercles “modified sebaceous glands of the breast which enlarge during early pregnancy”.
- **Morgagni, Giovanni Battist (1682-1771):** hydrated of Morgagni.
- **Moschocowitz:** abdominal culdoplasty
- **Muller, Johannes Peter (1801-1858):** Mullerian ducts.
- **Murray, Robert Milne (1855-1904):** Milne Murray forceps.

## N

- **Naboth, Martin (1675-1721):** Nabothian cysts.
- **Naegele, Franz Carl (1778-1851):**
  - Naegele rule: for calculating the E.D.D. from the L.M.P.
  - Naegele obliquity: posterior asynclitism (anterior parital bone presentation).
  - Naegele pelvis: unilateral arrested development of sacral alar; contracted pelvis.
- **Neisser, Albert Ludwig Siegmund (1855-1916):** Neisseria gonorrhea.
- **Nitabuch, Raissa:** Nitabuch layer "the basal plate of decidua basalis which protects against extra-invasion of chorionic villi (i.e protects against placenta accreta".
- **Novak:** curette
- **Nuck, Anton (1650-1692):** canal of Nuck.

## O

- **O'Sullivan, James Vincent (1899-1976):**
  - Test "1 hr postprandial screening in DM & the modified 3 hrs O.G.T.T."
  - Hydrostatic method "in treatment of acute uterine inversion".
- **Otto, Adolph W. (1786-1845):** Otto's pelvis "pelvis with deep acetabulum (familiar)".

## P

- **Paget, James (1814-1899):** Paget's disease "of breast and vulva".
- **Pajot, Charles (1816-1896):** Pajot's technique "for delivery of O.A by forceps".
- **Palmer, Raoul (1905-1985):** Palmer's sign "intra pelvic uterine contractions".
- **Papanicolaou, George Nicholas (1883-1962):** Pap smear.
- **Pawlik, Karl (1840-1914):** Pawlik's maneuver "1<sup>st</sup> pelvic grips".
- **Pearl, Raymond (1879-1940):** Pearl index "familiar of contraceptives".
- **Pfannenstiel, Hermann Johann (1862-1909):** Pfannenstiel incision.
- **Philpott & Castle:** curve "modified friedman curve (alert & action lines)".



- **Pinard, Aldophe(1844-1934):**
  - Pinard`s stethoscope: auscultation of fetal heart sounds (18-20 weeks).
  - Pinard`s maneuver: bringing down a leg (breech presentation).
  - Pinard`s test: for clinical assessment of C.P.D.
- **Piper, Edmund Brown (1891-1935):** Piper`s forceps “for delivery of the after coming head”.
- **Potter, Edith Louise (1901-1993):**
  - Potter \$ “renal agenesis + pulmonary hypoplasia + IUGR + prol. oligohydramnious”.
  - Potter facies “compressed face + depressed nose + small chin + low-set ears”.

## *R*

- **Reinke:** crystals in leydig cell tumor
- **Retzius, Anders Adolf (1796-1860):** cave of Retzius.
- **Ritgen, Ferdinand August Maria Franz Von (1787-1867):** Ritgen maneuver “never allow extension of the head before crowning (delivery of fetal head during 2<sup>nd</sup> stage of labor)”.
- **Robert, Heinrich Ludwig Fredinand (1814-1878):**
  - Robert`s pelvis: arrested development of both ala of sacrum “contracted pelvis”.
  - Robert`s sign: in IUFD “gas in the fetal heart and big vessels”.
- **Rolon:** Rolon plastic spatula for PAP test
- **Rubin, Isidor Clinton (1883-1958):** uterotubal insufflation “for tubal patency in infertility”, HSG

## *S*

- **Saling, Erich (b.1925):** Scalp blood sampling.
- **Sampson, John Albertson (1873-1891):**
  - Sampson`s theory of endometriosis.
  - Sampson artery of the round ligament (branch of the ovarian artery)
- **Scanzoni, Friedrich Wilhelm (1821-1891):** Scanzoni`s maneuver in O.P.
- **Schiller, Walter (1887-1960):** Schiller`s test “staining cervix with iodine in cervical carcinoma”.
- **Schuchadt:** incision (look episiotomy)

- **Schultze, Bernhard Sigmund (1827- 1919):** Schultze mechanism “of placental separation (inverted umbrella) 80 % of spontaneous placental deliveries”.
- **Sertoli, Enrico (1841-1910) & Leydig, Franz Von (1821-1908):** Sertoli-Leydig cell tumor.
- **Sheehan, Harold Leeming (1900-1988):** Sheehan’s \$ “postpartum pituitary gland ischemia”.
- **Shirodkar, Vithal Nagesh (1899-1971):** Shirodkar & modified Shirodkar’s operation “transvaginal cerclage”.
- **Simpson:** Forceps (short & long)
- **Sims, James Marion (1813-1883):**
  - Vaginal speculum.
  - Operation (vesicovaginal fistula).
  - Position.
  - Sims-Huhner postcoital test (after Huhner, Max (1873-1947).
- **Skene, Alexander Johnon Chalmers (1838-1900):** Skene’s (paraurethral) glands.
- **Smellie:** Mauriceau-Smellie-Veit manœuvre
- **Smith, Albert Holmes (1835-1885) & Hodge, Hugh Lenox (1796-1873):** Smith- Hodge pessary.
- **Smythe, Henry James Drew (1891-1983):** Drew-Smythe catheter “hindwater rupture”.
- **Spalding, Alfred Baker (1874-1942):** Spalding’s sign “over-lapping of skull bones after IUFD”.
- **Spiegelberg, Otto Von (1830-1881):** criteria of ovarian pregnancy.
- **Stein, Irving Freiler (1887-1976) & Leventhal, Michael Leo (1901-1971):** Stein- Leventhal \$ “polycystic ovarian disease”.
- **Steptoe, Patrick Christopher (1913-1988):** IVF.
- **Strassman:**
  - Sign “impulse on the uterine fundus will be transmitted to the cord if the placenta is not yet separated”.
  - Strassman-Jone & Tompkin : metroplasty
- **Sturmdorff, Arnold (1862-1934):** Sturmdorff suture “after cervical amputation (tracheloplasty)”.

## *T*

- **Tait, Robert Lawson (1845-1893):** 1<sup>st</sup> successful salpingectomy in ruptured tubal pregnancy.
- **Tarnier, Etienne Stephane (1828-1897):**
  - Tarnier forceps "axis-traction forceps".
  - Tarnier sign "straightening of the uterus with the lower uterine segment indicating impending abortion".
- **Thoms, H.:** Thoms' dictum (or rule), "BTD + post sagital diameter > 15 cm (diagnosis of contracted outlet).
- **Trendlenberg, Friedrich (1844-1924):** Trendlenberg's position.
- **Tuner, Henry Hubert (1892-1970):** Turner \$.

## *W*

- **Waldeyer, Heinrich Wilhelm Gottfried (1836-1921):**
  - Ovarian fossa (Fossa ovarica of Waldeyer).
  - Germinal epithelium of the ovary.
- **Wassermann, August Von (1866-1925):** Wassermann reaction "for syphilis".
- **Wertheim:** radical hysterectomy
- **Wharton, Thomas (1614-1673):** Wharton jelly "specialized structureless C.T of umbilical cord, protects against twisting".
- **White, Priscilla (1900-1989):** Modified White's classification of DM.
- **Wood's Charles Edwin:** Wood's screw manoeuvre
- **Wolff, Caspar Friedrich (1733-1794):** Wolffian ducts.
- **Wrigley, Arthur Joseph (1902-1983):** Wrigley forceps.
- **Wurm cerclage" Emergent cerclage:** 2U-shape sutures in cases of impending abortion".

## *Y*

- **Yusuf, Abdul-Fattah:**
  - Yusuf's \$ (vesicovaginal fistula + no incontinence + amenorrhea + menouria {or cyclic hematuria}).
  - Yusuf test to detect hidden SUI with prolapse

## *Z*

- **Zavanelli, William:** Zavanelli maneuver "retrograde CS in case of shoulder dystocia".