Induction of Labor and Abortion

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Induction of Labor

- *Definition:*

  Induction of labor refers to initiation of uterine contractions before spontaneous onset of labor by medical and/or surgical means for the purpose of delivery.

Conditions to be fulfilled before labor induction:

1. *A clear indication for the procedure.*
2. *Confirmed gestational age and/or documented lung maturity.*
3. *Vertex presentation.*
4. *Favorable cervix.*
5. *Negative contraction stress test.*
6. *Reactive non-stress test.*
7. *No evidence of CPD.*
8. *No contraindications for vaginal delivery e.g placenta previa*

BISHOP SCORE

- ***The cervical status is assessed by using modified Bishop Scoring system. Unripe cervix (Score <6) needs cervical ripening before labor induction.***

Parameter	*Score*			
	0	1	2	3
1-Dilatation (cm)	Closed	1-2	3-4	5 or more
2-Effacement (%)	0-30	40-50	60-70	80or more
3- Station	-3	-2	-1 or 0	+1,2,..
4- C. consistency	Firm	Medium	Soft	
5- Cervical positon	Posterior	Midposition	Anterior	

Indications of Labor induction :

Indication	Absolute	Relative
I-Maternal:	1-Pregnancy-induced hypertension. 2-Uncontrolled diabetes 3-Ch. renal disease. 4-Ch.Pulmonary disease.	1- Ch. Hypertension. 2- Gest. Diabetes. 3-Risk of precipitate labor. 4-Psychosocial indications.
II- Fetal:	1-Chorioamnionitis. 2- Non-reassuring FHR. 3- Severe IUGR. 4- Post-term pregnancy. 5- Some RH-isoimmunization cases.	1- PROM. 2- Fetal macrosomia. 3- Fetal demise. 4- Previous stillbirth. 5- Major cong. Anomalies.
III-Utero-placental:	Placental abruption.	Unexplained oligo-hydramnios.

Contraindications of labor induction:

Contraindication:	Absolute	Relative
I- Maternal:	1- Active genital herpes and HIV 2- Absolute CPD 3- Serious Ch. medical condition	1- Cervical carcinoma. 2- Grandmultiparity. 3- Multiple pregnancy.
II- Fetal:	1-Transverse lie 2-Extreme fetal compromise.	1-Breech presentation. 2-Fetal macrosomia.
III-Utero-placental:	1-Cord prolapse. 2-Placenta previa 3-Vasa previa. 4-Prev.classic C.S	1-Low-lying placenta. 2-Unexplained vaginal bleeding. 3-cord presentation. 4-prev. myomectomy

Methods of cervical ripening and labor induction:

I- Pharmacologic methods:

1. *Oxytocin*
2. *Prostaglandins.*
   - *A- PGF2α (Enzaprost)*
   - *B- PGE2 (Prostin E2)*
   - *C- PGE1 analogue (Misotac)*
3. *RU 486 (Mifepristone).*
4. *Under trials: Estrogen, Relaxin, ZK98299 (Onapristone), and Dehydoroepiandrostenedione sulphate.*

Methods of cervical ripening and labor induction (cont.)

II- Mechanical methods:

- *Hygroscopic dilators e.g laminaria, Lamicel, Dilapan.*
- *Balloon catheter (with infusion and traction).*
- *Stripping of membranes.*

III- Surgical methods *(Amniotomy).*

OXYTOCIN:

- *It is an octapeptide (9 amino-acids) synthetized in the paraventricular and supraoptic nuclei of the hypothalamus, and then it is transported and stored in the neurohypophysis. It's half life is 3-4 minutes. Oxytocin is inactivated largely in the liver and kidney by cysteine-aminopeptidase enzyme.*

OXYTOCIN (cont.):

- ***Mechanism of Action:***

  In the myometrial cells, Oxytocin increase the activity of phosphodiesterase enzyme which catalyze c.AMP resulting in decreased c.AMP causing release of calcium from endoplasmic reticulum which in turn activate myosin light chain kinase (MLCK) in myometrial cells causing uterine contraction.

Oxytocin Dosage protocols:

1. *Oxytocin is given as intravenous infusion. The starting dose is usually 0.5 mIU/minute, and this rate is doubled every 15-20 minutes according to the response. Usually, 30-40 minutes are required to reach steady state concentration after initiating or changing the dose.*
2. *Another protocol is to dilute 10 units synthetic Oxytocin into 1000 ml saline or ringer resulting in a concentration of 10mIU Oxytocin/ml. Approximately 15 drops are equivalent to one ml, and the infusion is begun with 10 drops per minute and the dose is doubled every 15 minutes until a maximum of 60 drops/minute is reached.*

OXYTOCIN- SIDE EFFECTS

- *Uterine hyper stimulation: This is a common problem. It may cause fetal distress, placental abruption or even uterine rupture.*
- *Water intoxication: Oxytocin is structurally and functionally related to vasopressin (ADH). Excessive or prolonged use of Oxytocin can cause fluid retention characterized by hyponatremia, confusion, convulsion, heart failure, and coma.*
- *Hypotension.*
- *Uterine rupture.*
- *Neonatal hyperbilirubinemia.*
- *IV bolus can cause severe coronary spasm.*

Prostaglandins:

- *Prostaglandins are arachidonic acid-derived 20-carbon bioactive lipids. Family members commonly used in obstetrics include PGF2α (e.g Enzaprost amp.), PGE2 (e.g Prostin E2 3mg tab.), and PGE1 analogue (e.g Misotac tab.).*
- *Prostaglandins are commonly used now locally for cervical ripening and labor induction. Many preparations are available such as vaginal tablets, suppositories, and gel.*
- *Common side effects include; hyperstimulation, GIT upset, shivering, and bronchial spasm.*

Progesterone receptor antagonists:

- *RU 486 (Mifepristone) and ZK98299 (Onapristone) can be used vaginally for cervical ripening and labor induction. They are effective and have few side effects.*

Mechanical methods:

I. *Hygroscopic (osmotic) dilators: such as Lminaria tent (sea weed) or synthetic Lamicel can be inserted into the cervix to slowly swell and dilate the cervix in 4-6 hours. They are used mainly for ripening the cervix.*

II. *Foley's catheter: commonly used mechanical dilator. It is infused with 30-50 ml saline after insertion into the cervix, and can help in cervical dilatation and initiation of uterine contractions.*

Mechanical methods (cont.):

III- Stripping of membranes: a very old method of labor induction. Separating fetal membranes from the lower uterine segment by sweeping the finger all around inside the cervix will help to release local prostaglandins and may initiate uterine contractions. It has the disadvantage of introducing infection especially if accidental rupture of membranes occurs.

Surgical methods (Amniotomy):

- *Artificial rupture of membranes using a toothed clamp or amniohook may be used to initiate uterine contractions if all the conditions are favorable for vaginal delivery and the head is engaged to prevent accidental cord prolapse. Some degree of cervical dilatation is required for the procedure, so this method is done only with favorable cervix and when delivery time is expected to be short.*

Induction of Abortion

- ***Definition***:

  Termination of pregnancy before the time of fetal viability by medical and/or surgical methods.

Abortion induction techniques:

I- Surgical techniques:

1. *Menstrual aspiration.*
2. *Dilatation and Evacuation (D&E).*
3. *Laparotomy (rare):*
   - *Hysterotomy.*
   - *Hysterectomy.*

Abortion induction techniques (cont.):

II- Medical techniques:

1. **Oxytocin.**
2. **Prostaglandins:**
    1. *Intra and extra-amniotic injection.*
    2. *Vaginal or rectal insertion.*
    3. *Oral ingestion or parenteral injection.*
3. **Anti-progesterones***: RU486, Epostane.*
4. **Hygroscopic (osmotic) dilators.**
5. **Hyperosmotic fluids** *(obsolete now?):*
    1. *Hypertonic saline 20%*
    2. *Hyperosmotic urea 30-40%.*
6. **Various combinations** *of above.*

Menstrual Aspiration (suction):

- *Aspiration of the endometrium using a flexible 5-6mm Karman canula without cervical dilatation in the first 1-3 weeks after the first missed period has been referred to as menstrual extraction or aspiration.*

Dilatation and Evacuation (D&E):

- *The most common method of induction of abortion in the first trimester. It is started by dilatation of the cervix using either hygroscopic dilators (e.g laminaria, Lamicel) or metal dilators (e.g Hegar or Pratt dilators).*
- *Dilatation and evacuation should be done under anesthesia such as general anesthesia, or paracervical block. Gradual dilatation 5mm upgrading is required to avoid cervical laceration. After the cervix is dilated enough to admit the ovum or ring forceps, evacuation of the uterine contents is started. After ensuring complete evacuation, gentle sharp curettage is required.*

Complications of D&E:

- *Uterine perforation: gentle introduction of uterine sound, dilators, ring or ovum forceps, or curette is required to avoid accidental perforation. Small perforations without external or internal bleeding may justify only follow up and conservation. However, some cases require immediate laparotomy such as big perforations, septic abortion, suspected malignancy or deteriorating general condition of the patient.*
- *Cervical laceration: Rapid and/or vigorous dilatation may lacerate the cervix ending in either cervical incompetence or stenosis.*

Complications of D&E (cont.):

- *Excessive curettage may remove the basal layer causing intrauterine synechiae.*
- *Incomplete evacuation. Complete evacuation is ensured by decrease or stoppage of bleeding, smaller contracted uterus, frothy blood, and well-formation of the cervix.*
- *Intrauterine infection and PID may follow D&E*

THANK YOU