Induction of labour & Prolonged pregnancy

Dr Ismaiel Abu Mahfouz
Definitions

Induction of labour (IOL)

- An artificial stimulation of uterine contractions before onset of spontaneous labour with intention to effect progressive effacement and dilatation of the cervix and, ultimately, delivery of a feto-placental unit
- The term is usually restricted to pregnancies at gestations greater than the legal definition of fetal viability (\( \geq 24 \text{ wks} \))

Augmentation of labour

- Stimulation of spontaneous contractions that are considered inadequate
IOL

- One of the most common obstetric interventions
- Prolonged pregnancy: most frequent indication
- Performed in > 20% of maternities
- Success rate is gestational age dependent
  - 60–80% at term
  - < 35% at 34 wks
IOL

• When thinking about IOL, you are considering that vaginal delivery is the best route for the delivery of the baby

• Indicated when interrupting the pregnancy is thought to be safer for the mother or the baby than allowing pregnancy to continue
Indications for IOL

- Pregnancy > 41 completed weeks
- Pre-labour spontaneous rupture of membranes
- Maternal disease
  - Diabetes
  - Hypertensive / renal disease
  - Autoimmune disease, e.g. SLE
  - Malignancies (Facilitate definitive therapy)
- Pregnancy-related conditions
  - Pre-eclampsia
  - Obstetric cholestasis
  - Recurrent antepartum haemorrhage (APH)
  - APH at term
  - Chorioamnionitis
Indication for IOL

• Fetal:
  o IUGR
  o Oligohydramnios
  o Isoimmunisation
  o Intrauterine fetal death (IUFD)
  o ??? Suspected fetal macrosomia (limited evidence)

• Social factors: “Maternal request”
Contraindications for IOL

- Placenta praevia / vasa praevia
- Abnormal lie
- Umbilical cord prolapse
- Primary active genital herpes close to time of IOL
- Previous classical uterine incision
- >=2 CS
- ? Myomectomy where uterine cavity was opened
- Maternal or fetal anatomical abnormality that contraindicates vaginal delivery
Predictors for successful IOL

Strong predictors

• Gestational age at induction
• Parity
• Modified Bishop’s score of the cervix
## Cervical favourability

### Modified Bishop’s Score

<table>
<thead>
<tr>
<th>Cervical Feature</th>
<th>Pelvic Score 0</th>
<th>Pelvic Score 1</th>
<th>Pelvic Score 2</th>
<th>Pelvic Score 3</th>
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</thead>
<tbody>
<tr>
<td>Dilatation(cm)</td>
<td>&lt; 1</td>
<td>1-2</td>
<td>2-4</td>
<td>&gt; 4</td>
</tr>
<tr>
<td>Length of cervix(cm)</td>
<td>&gt; 4</td>
<td>2-4</td>
<td>1-2</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Station</td>
<td>-3</td>
<td>-2</td>
<td>-1/0</td>
<td>+1/+2</td>
</tr>
<tr>
<td>Consistency</td>
<td>Firm</td>
<td>Average</td>
<td>Soft</td>
<td>___</td>
</tr>
<tr>
<td>Position</td>
<td>Posterior</td>
<td>Mid/Anterior</td>
<td>___</td>
<td>___</td>
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</tbody>
</table>

- **Favorable cervix**: Bishop’s score > 8
- **Unfavourable Cervix**: Bishop score < 4
Where to induce?

- Antenatal ward
- Labour ward
Prior to IOL

- Confirm GA
- Review obstetric history
- Indication / contraindications
- Medical history
- Check lie & confirm cephalic presentation
- Cx favourability (Bishop score)
- Membranes status (Intact or ruptured)
- Fetal heart rate pattern
Methods of IOL

- Prostaglandins (PG)
- Oxytocin
- Misoprostol
- Mechanical methods
- Surgical (Artificial rupture of the membranes)
- Other methods
Prostaglandin PGE2= dinoprostone

**Tablet**
- 3 mg into posterior vaginal fornix
- 2\textsuperscript{nd} dose 6–8 hours, 3\textsuperscript{rd} if ARM not possible
- Maximum dosage is 6 mg / 24 hours

**Gel**
- 1 or 2 mg preparations (parity)
- 2\textsuperscript{nd} dose after 6 hours
- Maximum dose 3 mg / 24 hrs

**Slow release vaginal device**
- Controlled release within a retrieval device
- 10 mg of dinoprostone is released over 24 hours
- Can be removed if uterine hyperstimulation
- It does not require refrigeration
Prostaglandin PGE2 = dinoprostone

- Inpatient only
- Pt needs to stay recumbent and CTG monitoring for 30–60 minutes after insertion
- Contractions
  - Usually start within 60 min.
  - Peak within 4 hours
- Oxytocin should not be started within 6 hrs of the last PGE2
Oxytocin

- Potent & easy to titrate, has a short half-life (1-5 minutes) & is well tolerated
- 10 IU of oxytocin/500 ml N/S(or R/L)
- Infusion pump or syringe driver
- Infusion starts at a rate of 1–2 mU/minute & increased Q 30 minutes (max. dose 32 mU/min)
- Increased until 4-5 contractions / 10 minutes
Misoprostol

- Unlicensed for IOL (Concerns about safety)
- Synthetic prostaglandin E1 analogue
- Extensively absorbed from GIT
- Metabolism: De-esterified to prostaglandin F analogs
- Half life: 20–40 minutes
- Excretion: Mainly renal (80%), remainder is fecal
- Cheap and stable at room temperature
- Given orally, rectally, vaginally, buccal, sublingually
- Rectal route to prevent and Rx PPH

Current use: “Only IUFD or in the context of a clinical trial”
Mechanical methods

Stripping of the membranes (S&S)

- Digital separation of membranes from cx
- Leads to local release of PG
- Cervical os should admit a finger
- Risks: discomfort, bleeding, ROM
- 30% will go into spontaneous labour in <7 days
- In majority it results in a more favourable cervix
Mechanical methods

Catheters and laminaria tents

- Introduced into the cervical canal or extra-amniotic space
- Aim: ripens cx through direct dilatation of the canal or, indirectly, by increasing prostaglandin & / or oxytocin secretion
Mechanical methods

Advantages
• Simplicity of preservation
• Low cost
• Reduction of side-effects from medical Rx

Disadvantages
• Difficulty inserting through unfavourable cx
• Maternal discomfort
• Risk of infection
Amniotomy (ARM)

- **Indications**
  - Initiate or augment labour
  - Apply fetal scalp electrode
  - Do fetal blood sampling

- **FHR**: recorded before and after ARM

- **Vaginal examination**:
  - Dilatation / station

- **Presenting part should be well fitted to cx**

- **Nature of amniotic fluid is recorded**:
  - Clear, bloody, meconium, excessive, minimal
Amniotomy (ARM)

Risks

- Cord prolapse (0.5%)
- Chorioamnionitis (if prolonged induction)
- Rupture of vasa previa
Other methods investigated

Mifepristone
• Anti-P counteracts inhibitory effect of P on uterus
• Limited data for IOL (research)

Homeopathy (herbs)
• No evidence of effective

Acupuncture
• No evidence of effectiveness

Caster Oil
• Not effective

Sexual intercourse
• Semen is rich in PG
• Little evidence to support effectiveness
Complications of IOL

- Hyperstimulation
- Fetal distress
- Failed induction
- Caesarean section
- Ruptured uterus
- Adverse effects of drugs used for induction
Hyperstimulation

Definitions

- **Tachysystole**: > 5 contractions in 10 minutes over at least 20 minutes
- **Hypertonus**: a contraction lasting > 2 associated with changes in the fetal heart trace

Management

- Stop or reduce rate of oxytocin infusion or remove any prostaglandins still present vaginally
- Consider tocolytics: Terbutaline 0.25mg s/c
- FHR changes that fail to resolve may need immediate delivery
Fetal distress

- Tocolysis in hyperstimulation may be beneficial
- If fetal distress is severe, immediate delivery
- If reason for IOL is suspected fetal compromise, baby is less able to withstand any reductions in placental oxygenation, leading to fetal distress
Failed IOL

- **Failed IOL:** If labour cannot be initiated despite use of induction agents
- **No accepted definition:** but if 3 doses of vaginal prostaglandins have not ripened cx sufficiently for ARM, then further doses are unlikely to be helpful

**Options to manage failed induction:**
- Repeat at a later GA
- Wait for labour to start spontaneously
- Deliver by CS
- Consider use of alternative method such as an intra-cervical catheter
Caesarean Section (CS)

- Controversial
- IOL is associated with greater rates of CS than spontaneous labour
Ruptured uterus

Uterine rupture:
- A disruption of uterine muscle extending to and involving uterine serosa or disruption of uterine muscle with extension into bladder or broad ligament

A uterine dehiscence:
- A disruption of uterine muscle with intact serosa
Adverse effects of Oxytocin

- Excessive uterine contractions
- Water intoxication and hyponatraemia
- Nausea and vomiting
- Arrhythmias
- Anaphylactoid reactions and rashes
- Placental abruption
- Amniotic fluid embolism
Adverse effects of Prostaglandins

- Excessive uterine contractions
- Nausea, vomiting, diarrhoea
- Pulmonary or amniotic fluid embolism
- Placental abruption
- Fetal distress
- Maternal hypertension
- Bronchospasm
- Fever
- Backache
- Stillbirth or neonatal death
- Vaginal discomfort
Issues in counselling around IOL

- Some women have strong feelings against any medical intervention
- Other women are 'fed up' and request IOL
- Ensure that women fully understand choices they are making
- Discuss reasons, method of IOL and risks
- Written information to take home
Special cases

IOL following previous C/S

- Inadequate data
- May use
  - S&S
  - Mechanical
- PG: associated with ruptured uterus
Special cases

“Grand multipara”

Definition: 5 or more deliveries

IOL associated with increased incidence of

- Precipitate labour
- Uterine rupture
- PPH

PG recommended as 1st line agent (smaller dose)

Syntocinon increased slowly Q 45 minute
Prolonged Pregnancy
Prolonged pregnancy

• Cause of anxiety for both women & obstetrician
• Common situation
• Associated with increased risk to fetus
• Many women find the physical burden of pregnancy at or near term to be intolerable
Definition (WHO & FIGO)

• 42 completed weeks (294 days) or more
• GA established by ultrasound prior to 16 weeks

Term pregnancy

• A pregnant women is 'at term' when her pregnancy duration reaches 37 weeks
Incidence

- 5-10%
- 58% of women will deliver by 40 weeks
- 74% by 41 weeks
- 82% by 42 weeks
Aetiology

• Not clear
• More common in primigravid women
• 30% recurrence with previous post-term pregnancy

Theory

“Some infants born post-term may have an inherent biological defect “ this theory is supported by:

  o Infants delivered following a post-term pregnancy are at increased risk of demise up to two years of age
  o SIDS is more common in infants born after 41 completed weeks
Fetal & neonatal risks

Post-term pregnancy is NOT a pathological condition

Post-maturity syndrome
Reflecting placental insufficiency
Included
• Meconium-stained amniotic fluid
• Oligohydramnios
• Fetal distress
• Loss of subcutaneous fat
• Dry cracked skin

Not every post-term pregnancy is complicated by the post-maturity syndrome

The majority of morbidity and mortality associated with post-term pregnancies arises because of post-maturity
Fetal & neonatal risks

• 2-3 X increased perinatal mortality and morbidity

• Stillbirth rate increases
  - 1 : 1000 at 37 weeks
  - 3 : 1000 at 42 weeks
  - 6 :1000 at 43 weeks

• Intrapartum fetal hypoxia, may result in:
  - Fetal acidosis
  - Neonatal seizures
  - Perinatal death

• Macrosomia: may cause birth trauma and shoulder dystocia
Maternal Risks

Increased risks of

- Operative delivery
- Haemorrhage
- Infection
- Psychological morbidity
Management

CS: If vaginal delivery is contraindicated

IOL at $\geq 41$ is associated with:

- ↓ CS rate compared to expectant Mx
- ↓ Rate of non-reassuring fetal heart changes
- ↓ Meconium staining of amniotic fluid
- ↓ Macrosomia (> 4 Kg)
- ↓ Rate of fetal or neonatal death

( mostly ↓ stillbirth due to ↓ asphyxia & meconium aspiration )
Expectant management with fetal surveillance

- If mother declines IOL despite explanation of risks

Fetal surveillance

- Fetal movement
- Monitoring should be at frequent intervals “? Twice weekly “CTG and AFI +/- Doppler, BPP”
- All of the tests have false +ve & false –ve
Remember

- Dating scan reduces rates of IOL for post-term pregnancy
- NICE advises U/S scan to determine GA using:
  - Crown–rump measurement from 10 weeks + 0 days to 13 weeks + 6 days
  - Head circumference if crown–rump length is above 84 mm