كلية : كلية الطب العام

القسم او الفرع : النسائية والتوليد

المرحلة: الرابعة

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اسم المادة باللغة العربية :التوليد

اسم المادة باللغة الإنكليزية : Obstetrics

اسم المحاضرة الحادية عشرباللغة العربية: Induction of labour

اسم المحاضرة الحادية عشر باللغة الإنكليزية : تحفيز الولادة

محتوى المحاضرة الحادية عشر
Induction of labour

IOL is the planned initiation of labour prior to its spontaneous onset.

Approximately 20– 25% of deliveries in the UK occur following IOL.

Broadly speaking, IOL is performed when the risks to the fetus and/or the mother of the pregnancy continuing outweigh those of bringing the pregnancy to an end. It should only be performed if there is a reasonable chance of success and if the risks of the process to the mother and/or fetus are acceptable. If either of these is not the case, the woman should be advised to await spontaneous onset of labour or a planned caesarean section should be performed.

Indications of inductions of labour

Prolonged pregnancy (usually offered after 41 completed weeks).
PROM.
Pre-eclampsia and other maternal hypertensive disorders.
FGR.(fetal growth restriction)
Diabetes mellitus.
Fetal macrosomia.
Deteriorating maternal illness.
Unexplained antepartum haemorrhage.
Twin pregnancy continuing beyond 38 weeks.
Intrahepatic cholestasis of pregnancy.
Maternal isoimmunization against red cell antigens.
‘Social’ reasons.

The most common reason for IOL is prolonged pregnancy described as ‘post-term’). There is evidence that pregnancies extending beyond 42 weeks’ gestation are associated with a higher risk of stillbirth, fetal compromise in labour, meconium aspiration and mechanical problems at delivery. Because of this, women are usually recommended IOL between 41 and 42 weeks’ gestation. Induction for prolonged pregnancy does not increase the rate of caesarean section.

Women who choose not to be induced for this reason are offered more intensive serial fetal monitoring.

Prelabour rupture of membranes (PROM) is another common indication for IOL. It is not uncommon for the membranes to rupture and the subsequent onset of labour to be significantly delayed. The longer the delay between membrane rupture and delivery of the baby, the greater the risk of ascending infection (chorioamnionitis) and neonatal and maternal infectious morbidity.

At term (beyond 37 weeks), good-quality evidence supports IOL approximately 24 hours following membrane rupture. This policy, endorsed in the NICE guideline on IOL, reduces rates of chorioamnionitis, endometritis and admissions to the neonatal unit. The evidence is less clear at present when PROM occurs preterm (PPROM). Before 34 weeks, some other additional indication is needed to justify IOL if the membranes rupture (e.g. suspected maternal infection, fetal compromise, growth restriction). Between 34 and 37 weeks, in an otherwise straightforward pregnancy, the risks and benefits of IOL need to be assessed on an individual basis.

Pre-eclampsia and other maternal hypertensive disorders often indicate earlier delivery. Pre-eclampsia at term is normally managed with IOL; however, at very preterm gestations (<34 weeks) or where there is rapid maternal deterioration or significant fetal compromise, caesarean delivery may be a better option.

Maternal diabetes, twin gestation and intrahepatic cholestasis of pregnancy are all common reasons for IOL at 38 weeks' gestation, and sometimes earlier.

Suspected fetal macrosomia (>90th percentile), in the absence of maternal diabetes, is now considered an indication for IOL . The difficulty with this approach is that the estimation of fetal weight by ultrasound has an error margin of 10–20% and some inductions may subsequently prove to have been unnecessary.

‘Social’ induction of labour is controversial and is performed to satisfy the domestic and organizational needs of the woman and her family. It is mostly discouraged, and there must be careful counselling as to the potential risks involved. These are determined essentially by the parity and the cervical condition. If the situation is favourable for vaginal birth, with higher parity and a favourable cervix, ‘soft’ indications are more acceptable. In any circumstance, an induced labour cannot be considered ‘normal’ and should be carefully supervised.

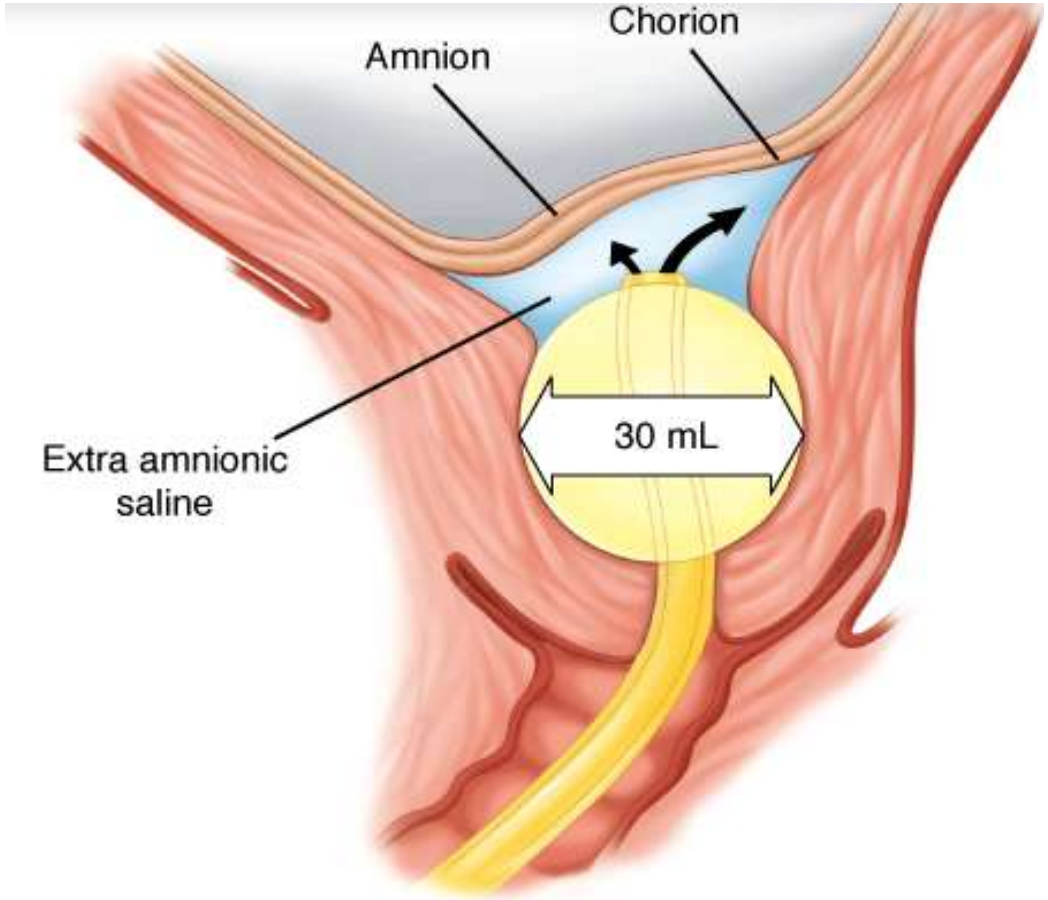
Methods of induction of labour

Mechanical Techniques

1.Transcervical Catheter

A Foley catheter may be placed through the internal cervical os. Downward tension that is created by taping the catheter to the thigh can lead to cervical ripening. A modification of this, termed *extra-amnionic saline infusion (EASI),* consists of a constant saline infusion through the catheter into the space between the internal cervical os and placental membranes. Catheter placement, with or without continuous saline infusion, results in improved cervical favorability and frequently stimulates contractions. They concluded that, with or without saline infusion, the method led to rapid improvement in Bishop scores and shorter labors. chorioamnionitis was less frequent when infusion was done compared with no infusion.

extra-amnionic saline infusion (EASI)



Labor Induction especially with saline infusion, the transcervical catheter technique is effective for initiating labor. Extra-Amnionic Saline Infusion (EASI) This technique has been reported to significantly improve the Bishop score and decrease induction-to-delivery times.

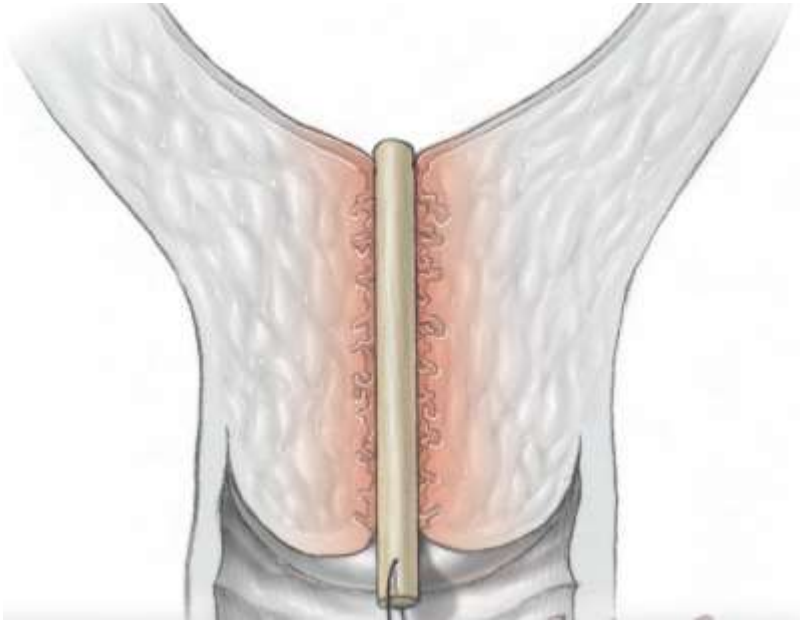
In one follow-up study, concluded that cervical ripening with a Foley catheter did not increase the risk of preterm birth in a subsequent pregnancy.

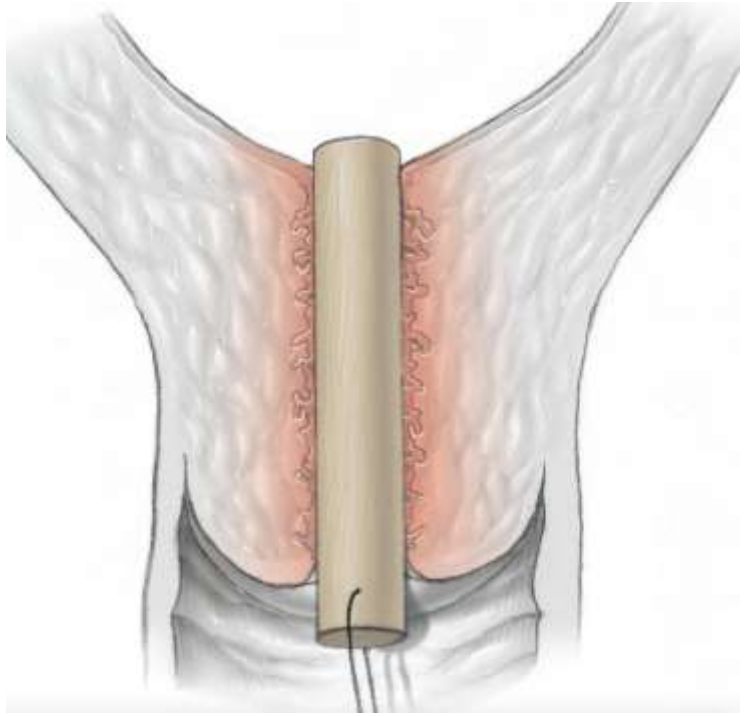
2.Hygroscopic Cervical Dilators

Cervical dilatation can be accomplished using hygroscopic osmotic cervical dilators These devices, called hygroscopic dilators, draw water from cervical tissues and expand, gradually dilating the cervix.. These mechanical dilators have long been successfully used when inserted prior to pregnancy termination. More recently, they have also been used for cervical ripening before labor induction. Concerns of ascending infection have not been verified. Thus, their use appears to be safe, although anaphylaxis has followed laminaria insertion. Dilators are attractive because of their low cost and easy placement and removal.

It has been reported that a rapid improvement of cervical favorability in women randomized to hygroscopic dilators prior to oxytocin induction. There was, however, no beneficial effect on the vaginal delivery rate or induction-to-delivery times compared with those of women given oxytocin only.

Hygroscopic Cervical Dilators





3.Membrane Stripping for Labor Induction

‘Membrane sweeping’ describes the insertion of a gloved finger through the cervix and its rotation around the inner rim of the cervix. This safe technique strips off the chorionic membrane from the underlying decidua and releases natural prostaglandins. It can be uncomfortable for the woman, and is only possible if the cervix is beginning to dilate and efface. It can be performed more than once and evidence shows that it reduces the need for induction. It is usually only performed at term, and placenta praevia must be excluded before it is offered. It should be considered an adjunct to the normal processes of induction.

Induction of labor by membrane "stripping" is a common practice .It had been reported that stripping was safe and decreased the incidence of post-term gestation. The incidence of ruptured membranes, infection, and bleeding was not increased. Importantly, subsequent induction for post-term pregnancy at 42 weeks was significantly decreased with stripping.

4.Amniotomy

A common indication for artificial rupture of the membranes—surgical amniotomy—includes the need for direct monitoring of the fetal heart rate or uterine contractions, or both. During amniotomy, to minimize the risk of cord prolapse, care should be taken to avoid dislodging the fetal head. Fundal or suprapubic pressure or both may reduce the risk of cord prolapse. Some clinicians prefer to rupture membranes during a contraction. If the vertex is not well applied to the lower uterine segment, a gradual egress of amnionic fluid can sometimes be accomplished by several membrane punctures with a 26-gauge needle held with a ring forceps and with direct visualization using a vaginal speculum. In many of these, however, membranes tear and fluid is lost rapidly. The fetal heart rate should be assessed before and immediately after amniotomy.

Artificial rupture of the membranes—sometimes called surgical induction—can be used to induce labor, and it always implies a commitment to delivery. The main disadvantage of amniotomy used alone for labor induction is the unpredictable and occasionally long interval to labor onset. They found that amniotomy alone or combined with oxytocin was superior to oxytocin alone. Early amniotomy was associated with significant 4-hour shorter labor. With early amniotomy, however, there was an increased incidence of chorioamnionitis.

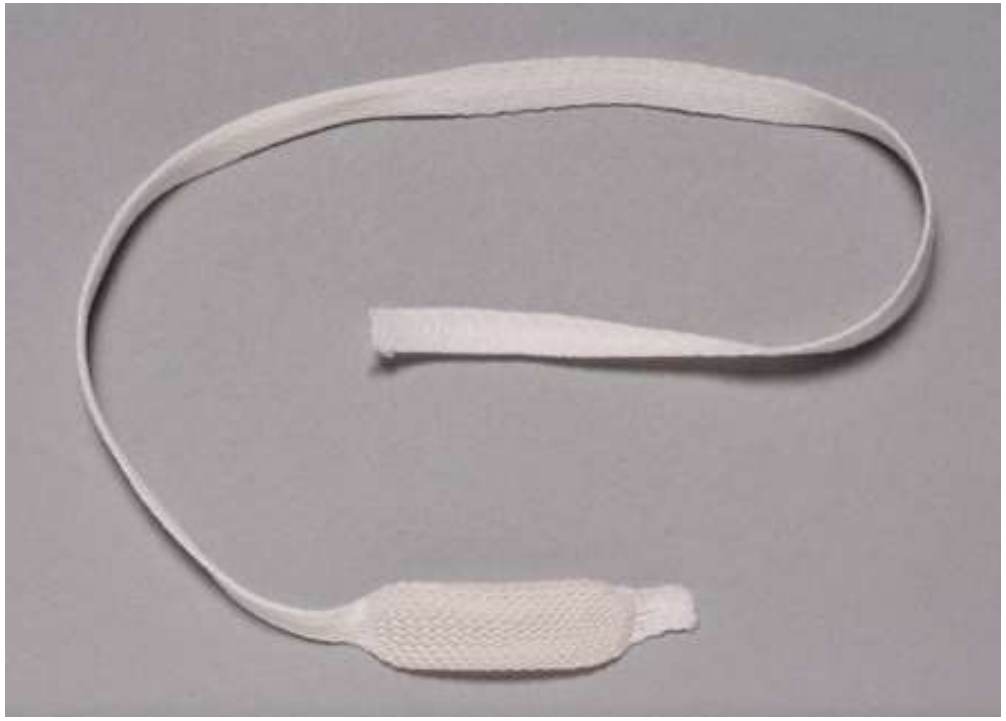
Pharmacological Techniques

1.Prostaglandin E_2

Local application of prostaglandin E_2—dinoprostone—is commonly used for cervical ripening. Its gel available in a 2.5-mL syringe for an intracervical application of 0.5 mg of dinoprostone. With the woman supine, the tip of a pre-filled syringe is placed intracervically, and the gel is deposited just below the internal cervical os. After application she remains reclined for at least 30 minutes. Doses may be repeated every 6 hours, with a maximum of three doses recommended in 24 hours.

A 10-mg dinoprostone vaginal insert is also approved for cervical ripening. This is a thin, flat, rectangular polymeric wafer held within a small, white mesh polyester sac.It is used as a single dose placed transversely in the posterior vaginal fornix. Lubricant should be used sparingly, if at all, with insertion. Excessive lubricant can coat and hinder the release of dinoprostone. Following insertion, a woman should remain recumbent for at least 2 hours. The insert is removed after 12 hours or with labor onset.

10-mg dinoprostone vaginal insert



Side Effects

Uterine hyperstimulation has been reported to follow vaginally administered prostaglandin E2 in 1 to 5 percent of women. Because hyperstimulation that can cause fetal compromise may develop when prostaglandins are used with preexisting spontaneous labor, such use is not recommended. If hyperstimulation occurs with the 10-mg insert, its removal by pulling on the tail of the surrounding net sac will usually reverse this effect. Irrigation to remove the gel preparation has not been helpful.

Contraindications to prostaglandin agents in general include asthma, glaucoma, or increased intraocular pressure. Moreover, manufacturer recommendations caution against its use in women with ruptured membranes.

2.Prostaglandin E1

Misoprostol—Cytotec—is a synthetic prostaglandin E1 , approved as a 100- or 200-g tablet for prevention of peptic ulcers. It has been used "off label" for preinduction cervical ripening and may be administered orally or vaginally. The tablets are stable at room temperature.

Although it has become widespread, the off-label use of misoprostol is controversial. Despite this, the American College of Obstetricians and Gynecologists (2000) quickly reaffirmed its recommendation for use of the drug because of proven safety and efficacy.

Vaginal Administration

Several investigators have reported that misoprostol tablets placed into the vagina were either of equivalent or superior efficacy compared with intracervical prostaglandin E2 . They recommended the 25-g dose—a fourth of a 100-g tablet. The drug is evenly distributed among these quartered tablets.

Misoprostol use may decrease the need for oxytocin induction and reduce induction-to-delivery intervals. A 50-g misoprostol intravaginal dose has been associated with significantly increased uterine hyperstimultion, meconium passage, and meconium aspiration compared with prostaglandin E2 gel. A 25-g intravaginal dose was found comparable to dinoprostone regarding adverse neonatal outcome.

Uterine rupture has been reported with prostaglandin E1 use in women with a prior cesarean delivery. Currently, the consensus is that prior uterine surgery, including cesarean delivery, precludes the use of misoprostol.


Pfizer
CYTOTEC
200 mcg compresse
misoprostolo
50 compresse

Oral Administration

Prostaglandin E1 tablets are also effective when given orally. They reported oral misoprostol administration to be of similar efficacy as intravaginal administration for cervical ripening and that a 100-g oral dose was as effective as a 25-g intravaginal dose.

Labor Induction with Prostaglandin E1

Both vaginal and oral misoprostol may be used for either cervical ripening or labor induction. It has been found vaginal misoprostol, followed by oxytocin if needed, to be superior to oxytocin alone for labor induction. Rates of cesarean delivery section were variable. Some studies showed decreased rates with misoprostol, whereas others found no difference in rates.

It appears that 100 g of oral or 25 g of vaginal misoprostol is similar in efficacy to intravenous oxytocin for labor induction in women at or near term with either prematurely ruptured membranes or a favorable cervix. Misoprostol may be associated with an increased rate of hyperstimulation. In addition, induction with PGE1 may prove ineffective and require subsequent augmentation with oxytocin. Thus, there are trade-offs regarding the risks, costs, and ease of administration of the two drugs, but either is suitable for labor induction.

3.Nitric Oxide Donors

Several findings have led to a search for agents that stimulate nitric oxide (NO) production locally to be used for clinical purposes. First, nitric oxide is likely a mediator of cervical ripening. Also, cervical NO metabolites are increased at the beginning of uterine contractions. Lastly, cervical NO production is very low in post-term pregnancy.

Use of the NO donors isosorbide mononitrate and glyceryl trinitrate: Isosorbide mononitrate induces cervical cyclo-oxygenase 2. It also induces cervical ultrastructure rearrangement similar to that seen with spontaneous cervical ripening.

Clinical trials have not shown NO donors to be as effective as prostaglandin E2 to effect cervical ripening . And the addition of isosorbide mononitrate to either dinoprostone or misoprostol did not enhance cervical ripening either in early pregnancy or at term and did not shorten time to vaginal delivery.

4.Labor Induction and Augmentation with Oxytocin

In most instances, pre-induction cervical ripening and labor induction are simply a continuum. Often, "ripening" will also stimulate labor. If not, however, induction or augmentation may be continued with diluted intravenous solutions of oxytocin given by infusion pump.

Synthetic oxytocin is one of the most commonly used medications in the United States. Regarding labor, it may be used for induction or for augmentation of labor.

With oxytocin use, the American College of Obstetricians and Gynecologists recommends fetal heart rate and contraction monitoring similar to that for any high-risk pregnancy. Contractions can be monitored either by palpation or by electronic means of recording uterine activity.

Risks versus Benefits

Unless the uterus is scarred, uterine rupture associated with oxytocin infusion is rare, even in parous women.

Oxytocin has amino-acid homology similar to arginine vasopressin. Thus, not surprisingly, it has significant antidiuretic action, and when infused at dosages of 20 mU/min or more, renal free water clearance decreases markedly. If aqueous fluids are infused in appreciable amounts along with oxytocin, water intoxication can lead to convulsions, coma, and even death. In general, if oxytocin is to be administered in high doses for a considerable period of time, its concentration should be increased rather than increasing the flow rate of a more dilute solution. Consideration also should be given to use of either normal saline or lactated Ringer solution in these circumstances.

Notes

Castor oil, bath and enema were a time-honoured method of inducing labour. Only one randomized trial has evaluated castor oil with inconclusive results. We have shown an association between castor oil, a cathartic, and meconium passage possibly by a direct effect on the fetal bowel.

Contraindications to IOL

There are a number of absolute contraindications to IOL, including placenta praevia and severe fetal compromise. Deteriorating maternal condition with major antepartum haemorrhage, pre-eclampsia or cardiac disease may favour caesarean delivery. Breech presentation is a relative contraindication to IOL, and women with a previous history of caesarean birth need to be informed of the greater risk of uterine rupture. Preterm gestation is not an absolute contraindication, but induction at <34 weeks is associated with a much higher risk of failure and the need for subsequent caesarean section.

Complications of induction of labour

It is generally agreed that a woman is likely to experience more pain with an induced labour and the use of epidural analgesia is more common.

The rates of instrumental delivery are higher where epidural analgesia is used, but two recent systematic reviews show no evidence of a higher rate of caesarean section.

Long labours augmented with oxytocin predispose to PPH secondary to uterine atony.

Fetal compromise may occur during induced labours and this, in part at least, is due to uterine hyperstimulation as a side-effect of use of prostaglandins and oxytocin. A contraction frequency of >5 per 10 minutes should be treated by stopping the oxytocin and if necessary administration of a tocolytic drug, most commonly a subcutaneous injection of the β2-agonist terbutaline.

Uterine hyperstimulation may precipitate a fetal bradycardia and the need for emergency caesarean section if the FHR fails to resolve promptly.

If ARM is performed while the fetal head is high, then cord prolapse may occur, again precipitating the need for emergency caesarean section.

Women with a previous caesarean section scar are at greater risk of uterine rupture if they are induced.

The risk of scar rupture increases from one in 200 in a spontaneous labour to as high as 1 in 70 if IOL is performed using prostaglandins.

IOL may fail and this is said to have occurred if an ARM is still impossible after the maximum number of doses of prostaglandin have been given or if the
cervix remains uneffaced and less than 3 cm dilated after an ARM has been performed and oxytocin has been running for 6–8 hours with regular contractions.
When an induction fails, the options include a rest period followed by attempting
induction again at some point in the future, or performing a caesarean section.
Delaying delivery further is only acceptable if there is no major threat to fetal or
maternal condition. This may be the case with a failed social induction, for example. Failed induction in the setting of pre-eclampsia or FGR will usually necessitate a caesarean delivery.

Thank you