CERVICAL DILATATION

Cervical Dilation, Cervical Ripening

The opening of the cervix, the entrance to the uterus, during childbirth, miscarriage, induced abortion, or gynecological surgery.

About Cervical dilatation

Cervical dilatation is a term that refers mostly to the physiological dilatation that occurs during childbirth dilatation (cervix changes from a tightly closed entrance to a fully open exit for the baby), although artificial dilatation of the cervical canal (Pic. 1) is a common procedure in gynaecological practice that is used for:

- therapeutic - such as inducing childbirth
- diagnostic procedures - such as hysteroscopy (procedure used to examine the inside of the uterus), explorative curettage (removing the surface layer of mucous membrane of the uterus and cervix) or placement of intrauterine contraceptive devices

Cervical dilatation is assessed by vaginal examination, which should be performed every 4 hours, unless there are indications to do so more frequently.

Physiological dilatation

In the later stages of pregnancy, the cervix may already have opened up to 1–3 cm (or more in rarer circumstances; latent phase), but during labor, repeated uterine contractions lead to further widening of the cervix to about 6 centimeters (active labor). From that point, pressure from the presenting part (head in vertex births or bottom in breech births), along with uterine contractions, will dilate the cervix (transition) to 10 centimeters, which is "complete." Cervical dilation is accompanied by effacement, the thinning of the cervix.

Cervical dilatation can be also achieved using the following methods (also called cervical ripening agents):

1. Pharmacological
2. Surgical or mechanical methods
3. Non-pharmacological methods

Pharmacological

Pharmacological cervical dilatation refers to use of medications that can help dilation and effacement. They can be given orally, intravenously or through the vagina (per vagina). Those medications may be:

- oxytocin (hormone released into the bloodstream as a hormone in response to stretching of the cervix and uterus during labor and with stimulation of the nipples from breastfeeding. This helps with birth, bonding with the baby, and milk production)
- progesterone receptor antagonists
- prostaglandins (PGs): Dinoprostone (PGE2) – Tablet or gel
- hyaluronic acid
- relaxin (one of the natural hormone which induces childbirth)
- estrogen (another key natural hormone tied to childbirth)

Prostaglandins are one of the most used pharmacological drugs for inducing childbirth. They at the same time induce uterine contraction and aid in cervical ripening. Vaginal administration of this drug is much more effective than oral use. The mother needs to be on complete bed rest and monitored before these drugs are administered.
Surgical or mechanical methods

Cervical dilation may be induced mechanically by placing devices inside the cervix that will expand while in place. A balloon catheter may be used. Other products include laminaria (made of dried seaweed) or synthetic hygroscopic materials, which expand when placed in a moist environment.

In hysteroscopy, the diameter of the hysteroscope is generally too large to conveniently pass the cervix directly, thereby necessitating cervical dilation to be performed prior to insertion. Cervical dilation can be performed by temporarily stretching the cervix with a series of (cervical) dilators of increasing diameter.

Those procedures can be:
- amniotomy or artificial rupture of membranes (AROM) - the procedure by which the amniotic sac is deliberately ruptured
- mechanical dilators - use device provides pressure on the cervix to open it, i.e. balloon catheter (Pic. 2)
- membrane stripping - uses gloved hand to sweep inside the cervix

Non-pharmacological methods

Home techniques that were developed over the centuries. They are very useful for delivery outside of medical centers.

These techniques may include:
- breast stimulation
- castor oil or hot baths
- sexual intercourse
- acupressure and acupuncture
- enemas
- naturopathy – drinking of primrose oil, red raspberry leaf tea, thistle herb and others herbal medicine remedies

Success or failure factors

The cervix dilates naturally when the body is ready to give birth, but when it’s necessary to move things along more quickly, dilation may be stimulated using mechanical techniques or medication.

Mechanical dilators

The most common method for cervical dilatation is to use Hegar dilators (Pic. 3). This method requires significant force, which may lead to permanent damage of the cervical canal. Other methods of cervical dilatation involve the use of osmotic dilators or prostaglandin analogues, which are impractical, often nonfunctional and cause undesirable effects such as cervical haemorrhage (bleeding) or uterine cramping.

Medication

It is important to note that there are absolute and relative contraindications for the use of prostaglandins and the presence of a prior uterus scar is one of the formal contraindications. Consequently, the pursuit of increasing the options for cases requiring induction in which prostaglandin use is not always the best one, different studies have resumed focusing on mechanical and other pharmacological methods. Therefore, some compared Pgs with the Foley catheter and demonstrated similar and even better results for certain groups of women using the Foley catheter. This made the method, available everywhere, scientifically come back to life and several studies were performed demonstrating its efficacy, safety without increasing the need of additional substances, for example oxytocin or even prostaglandins in the procedure.

Complications

Risks for mother:
• prolonged labor
• psychological stress
• potential use of higher doses of anesthesia and painkillers
• increased chances of cesarean section if induction fails
• increased morbidity due to uterine infection and mechanical injury

**Risks for baby:**

• longer labor
• premature labor
• hypoxia (oxygen deficiency) due to labor complications
• mechanical stress
• infections

Prostaglandins can have side-effects such as uterine rupture, hyperstimulation of the uterus and passage of stools by the fetus.

**Prognosis**

If the technique is performed correctly, the risk of complications is minimized.

**Potential benefits of cervical dilatation:**

• lower medical costs
• shorter hospital stay
• fewer failed inductions
• potential prevention of infections
• potential prevention of maternal morbidity
• lower rates of Cesarean deliveries

**Gallery**

**Pic**
During childbirth, a slight opening of the cervix signifies the start of the childbirth process. The true opening of the cervix is usually accompanied with the start of the contractions, although they may start a bit later.

**Pic**
The tracking and measurement of the dilatation parameters could be performed by the pressure sensor, which is located on the dilator device, as well as by the displacement sensor, which is attached to the hydrostatic pump.
Hegar dilators are dilators used to treat vaginismus, induce cervical dilation, and for inflatable penile implant procedures.

Sources


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