

CERVICAL CERCLAGE

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1. INTRODUCTION

Cervical cerclage has its role in the prevention and treatment of cervical insufficiency. Cervical insufficiency accounts for 10% of the causes of spontaneous preterm birth and is associated with a significant neonatal morbimortality.

Cervical insufficiency has no well-defined diagnostic criteria. It is clinically suspected by the presence of cervical dilatation in the absence of uterine contractions. Some patients can also report pelvic pain, increased leucorrhoea, or slight bleeding.

Although in most cases cervical insufficiency occurs without prior history or suggestive clinical signs, some associated risk factors are:

- History of cervical insufficiency in a previous pregnancy.
- Subclinical intra-amniotic infection.
- Connective tissue defects due to cervical surgery (conization, trachelectomy, repeated cervical dilatations, cervical tears) or congenital connective tissue defects.
- Congenital cervical hypoplasia following exposure to diethylstilbestrol.

2. CERCLAGE NOMENCLATURE AND INDICATIONS

2.1 History-indicated cerclage (equivalent to prophylactic or primary cerclage)

It is performed as an elective intervention before the onset of cervical modifications in pregnant women with a previous history of cervical insufficiency. It is placed between 13 and 16 weeks of pregnancy, after the period of maximum risk of miscarriage. It should be considered in:

- Pregnant women with previous history of two or more fetal loss events in the second or early third trimester suggestive of cervical insufficiency.
- Previous history of one or more fetal loss events in the second or early third trimester after a cervical conization.
- Pregnant woman with a preterm delivery despite an ultrasound-indicated cerclage.

There is no scientific evidence that history-indicated cerclage is beneficial in:

- Low-risk population
- Multiple pregnancy
- Short cervix (≤ 15 mm) without previous history of preterm delivery
- Pregnant women with previous history of one fetal loss (even if suggestive of cervical insufficiency) and no history of previous cervical conization.

2.1.1 Abdominal cerclage

Cerclage indicated by previous obstetric history can also be performed by an abdominal approach, either by laparoscopy or laparotomy. This approach allows insertion of cerclage at the cervical-isthmic junction. Placement is usually performed prior to gestation, although it can be placed, like cervical cerclage, between 13 and 16 weeks.

There is little scientific evidence on the indications of abdominal cerclage, but the two most common ones are in:

- Women who undergo a cervical trachelectomy (generally in the same surgical procedure).
- Pregnant women who presented several fetal losses despite having been treated with other therapeutic options in their previous pregnancies (progesterone, pessary and/or cervical cerclage).

The mode of delivery after an abdominal cerclage placement will be caesarean section and the cerclage can be kept in situ for further pregnancies.

2.2 Ultrasound-indicated cerclage (equivalent to therapeutic or secondary cerclage)

It is performed in pregnant women with prior history of preterm delivery after the finding, by ultrasound, of a cervical shortening (cervical length <25 mm) before 26 weeks. Vaginal progesterone may be an equally effective alternative in these women. Since it is not an invasive procedure, progesterone will be the first-choice treatment, retaining cervical cerclage for women with a progressive cervical length shortening despite progesterone treatment.

In selected cases of singleton pregnancies without a prior history of preterm delivery, in which progressive cervical shortening is observed despite progesterone treatment, the indication for an ultrasound-indicated cerclage could be considered.

2.3 Physical examination-indicated cerclage (equivalent to tertiary or emergency cerclage)

This is indicated after the finding, by physical examination, of an asymptomatic cervical dilatation of 2 cm or more, and the visualisation of amniotic membranes through the external cervical os, before 26 weeks of gestation. In this clinical situation, amniocentesis prior to cerclage should be considered in order to rule out subclinical intra-amniotic infection. Cerclage has been shown to be more effective than expectant management with bed rest and tocolytic treatment.

3. CERVICAL CERCLAGE IN TWIN PREGNANCY

So far, there is little evidence regarding the use of cerclage in twin gestations and that which exists is still controversial:

- Cerclage indicated by obstetric history has not proven to be beneficial in patients with a twin pregnancy whether or not they have a history of preterm delivery. Its indication should be assessed, as for singletons, in pregnant women with a history of two or more fetal losses in the second or early third trimester suggestive of cervical insufficiency.
- Cerclage indicated for a short cervix should not be offered systematically to all twin pregnancies. Its placement should be individualised in cases of progressive cervical shortening, especially when the cervical length is <15 mm, despite vaginal progesterone.
- Cerclage indicated for asymptomatic cervical dilatation has also been demonstrated to be beneficial in twin pregnancies in comparison to expectant management. As in singleton pregnancies, an amniocentesis of the exposed amniotic sac should be performed prior to cerclage to rule out subclinical intra-amniotic infection.

4. CERCLAGE CONTRAINDICATIONS

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- Subclinical intra-amniotic infection or suspected clinical chorioamnionitis.
 - Significant vaginal bleeding secondary to placental abnormalities. Slight bleeding related to cervical dilatation should not be a contraindication.
 - Uterine contractions.

- Premature prelabour rupture of membranes.
- Fetal death or severe/lethal fetal abnormalities (structural/genetic).

5. CLINICAL MANAGEMENT BEFORE CERVICAL CERCLAGE

Before the procedure, pregnant women with history-indicated or ultrasound-indicated cerclage must have/receive:

- Signed informed consent
- Blood test with complete blood count and coagulation. Available negative maternal serologies (HIV, HBV, HCV)
- Endocervical culture. If the endocervical culture is positive, antibiotics will be administered according to the antibiogram of the microorganism isolated prior to the cerclage. Cerclage should not be postponed, and it can be performed concomitantly during the antibiotic treatment.
- Vaginal/Rectal culture for *Streptococcus agalactiae* in cases of cerclage $\geq 23+0$ weeks.
- Indomethacin 100 mg (rectal administration) 30 minutes prior to cerclage placement
- Antibiotic prophylaxis with single-dose cephalosporin during anaesthetic induction.
- Corticosteroids for lung maturation if cerclage is performed $\geq 24+0$ weeks.

Before the procedure, pregnant women with physical examination-indicated cerclage must have/receive:

- Signed informed consent
- Blood test with c-reactive protein, complete blood count and coagulation. Available negative maternal serologies (HIV, HBV, HCV)
- Endocervical culture. If the endocervical culture is positive, antibiotics will be administered according to the antibiogram of the microorganism isolated prior to the cerclage. Cerclage should not be postponed, and it can be performed concomitantly during the antibiotic treatment.
- Vaginal/Rectal culture for *Streptococcus agalactiae* in cases of cerclage $\geq 23+0$ weeks.
- Indomethacin 100 mg (rectal administration) 30 minutes prior to cerclage placement + Indomethacin 50 mg/6h (oral administration) in the 24 h post-procedure. Other tocolytics may be added in case of uterine contractions after cerclage, ensuring that subclinical intra-amniotic infection or clinical chorioamnionitis has been ruled out.
- Antibiotic prophylaxis with single-dose cephalosporin during anaesthetic induction. Prophylactic antibiotics should not be administered in case of membrane exposure without suspected infection.
- Corticosteroids for lung maturation if cerclage is performed $\geq 24+0$ weeks (or $\geq 23+0$ weeks if previously agreed with the family).
- Diagnostic amniocentesis to rule out subclinical intra-amniotic infection. Posterior management will be individualised according to the result of the amniocentesis:
 - Exclusion of subclinical intra-amniotic infection (glucose ≥ 14 mg/dl and absence of germs in the Gram stain): cerclage will be performed in the following 24-48 hours
 - High suspicion of subclinical intra-amniotic infection (glucose < 14 mg/dl and presence of germs in the Gram stain): It is a formal contraindication for immediate cerclage, although it is not an indication for active termination of pregnancy. Expectant management, while awaiting the results of the culture, will be adopted. Patients will receive antibiotic treatment with Ampicillin 2 g/6h + ceftriaxone 1 g/12h (endovenous) + clarithromycin 500 mg/12h (oral) and use of tocolytics will be avoided. Subsequent management will be agreed according to the culture result, gestational age, and maternal status.

- Discrepancy in any of the results (Glucose <14 mg/dl and Gram stain without germs or Gram stain with germs but glucose \geq 14 mg/dl): Patients will receive prophylactic antibiotic with Ampicillin 2 g/6h + ceftriaxone 1 g/12h (endovenous) + clarithromycin 500 mg/12h (oral) and use of tocolytics will be avoided, while awaiting the definitive culture.

6. CERVICAL CERCLAGE TECHNIQUE

6.1. General considerations

- Locoregional (preferably) or general anaesthesia.
- Lithotomy and Trendelenburg position.
- Vaginal and cervical washing with chlorhexidine solution
- Avoid emptying urinary bladder prior to the procedure.
- Anterior and posterior retractor valve placement.
- Identification and clamping of the anterior and posterior cervical lips with Foerster forceps.
- Rejection of amniotic membranes, if still prolapsed, with a cotton swab.
- Non-absorbable suture material is preferable.
- The aim of the cerclage is to place the stitch as close to the internal os as possible, always avoiding the needle passing through the cervical canal in order to prevent a haemorrhagic complication or the rupture of the amniotic sac.

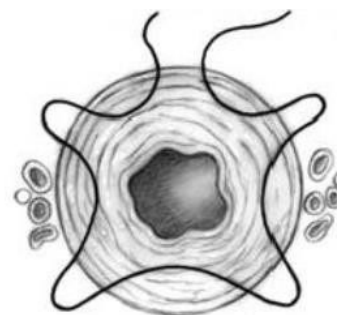
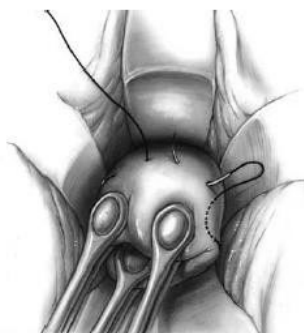
6.2. Cerclage technique

The standard cerclage procedures are McDonald and Shirodkar technique, with some modifications of them existing. Both techniques are equally accepted, as no differences in perinatal outcomes and surgical complications have been observed between them. Therefore, the choice of one technique or another is at the surgeon's discretion.

6.2.1. McDonald cerclage

This is probably the most commonly performed because it is easier to execute and, therefore, is the technique of choice in physical examination-indicated cerclage when the visualisation of cervical lips is poor due to bulging membranes.

In the McDonald technique, traction is applied to the cervix and the cervical-vesical junction is identified without opening the mucosa. The suture is placed within 4-5 needle passes around the cervix, avoiding the paracervical vessels at 3 and 9 o'clock, starting immediately under the vesicocervical junction and fixing the knot at 12 o'clock.



6.2.2. Shirodkar cerclage

In the Shirodkar technique, cervical traction is performed, and the vesicocervical junction is identified. The vesicocervical mucosa is opened, and the bladder is rejected. Similarly, the vaginal mucosa is opened in the posterior vaginal fundus and the mucosa is rejected. Two needle passes are carried out, each one covering one of the lateral sides.

In either technique, the knot can be left anterior or posterior, according to preference. However, anterior knots are easily identified later in pregnancy, which facilitates their removal. It is important to record the knot's location in the surgical report.



7. POSTOPERATIVE MANAGEMENT

After the procedure, pregnant women with history-indicated or ultrasound-indicated cerclage must have/receive:

- Relative bed rest since the day of the surgical procedure and for the rest of the pregnancy.
- A transvaginal ultrasound will be performed after 24 hours to ensure the correct placement of the suture. If there are no complications, the patient will be discharged from hospital after the examination.

After the procedure, pregnant women with physical examination-indicated cerclage must have/receive:

- Absolute bed rest and tocolytic treatment with indomethacin 50 mg/6h (oral administration) in the first 24 hours after cerclage placement.
- A transvaginal ultrasound will be performed after 24 hours to ensure the correct placement of the suture. If there are no complications, tocolytic treatment can be stopped and patient will initiate relative bed rest. Hospital discharge will be planned 48 hours after cerclage placement if there are no complications.

8. FOLLOW-UP AND MODE OF DELIVERY

The first clinical appointment after cerclage placement will take place in the following 7-10 days. If the cerclage is correctly placed and the clinical situation is stable, management will be individualised according to the indication for cerclage, every 2-4 weeks.

Endocervical cultures will be taken on a monthly basis.

Reduction of physical activity and avoiding sexual intercourse will be recommended until 34 weeks of pregnancy, individualising the need for prolonging sick leave.

The cerclage suture will be removed when pregnancy reaches term (37-38 weeks) if a vaginal delivery is intended. This can be performed on an outpatient basis, unless the patient has an indication for caesarean section, in which case, the cerclage will be removed in the same surgical procedure as the caesarean section. In cases of abdominal cerclage, the suture will be kept in situ for future pregnancies.

If uterine contractions that do not subside with tocolytic treatment appear, or if there is any suspicion of clinical chorioamnionitis, the cerclage must be removed to allow the labour to progress.

If premature rupture of membranes occurs, and intra-amniotic infection is ruled out by amniocentesis, or if there is no clinical-analytical suspicion of infection, the cerclage might be left in situ until 34 weeks. On the other hand, if infection is suspected or confirmed, or if unstoppable uterine contractions or significant bleeding appear, the cerclage will be removed, and labour will be allowed to progress.

9. MATERNAL POSITIVE OR UNKNOWN SEROLOGIES

If maternal serologies (HIV, HBV, HCV) are unknown:

- No maternal risk factors: request urgent serologies and perform the cerclage.
- Maternal risk factors (e.g. parenteral drug user, high prevalence country): it is recommended to postpone the cerclage until serology results are available (weighing the risk-benefit of postponing the cerclage)

If maternal serologies (HIV, HBV, HCV) are positive:

- HBV-HCV: weigh the risk-benefit of performing the cerclage and perform it if it is necessary.
- HIV:
 - Negative viral load: perform the cerclage.
 - Positive or unknown viral load: postpone the cerclage and weigh the risk-benefit of performing the cerclage and perform it if it is necessary.