

Transabdominal cerclage for managing recurrent pregnancy loss

Among women in whom prior transvaginal cerclage has failed, transabdominal cerclage has a high rate of success in providing a good pregnancy outcome

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CASE A woman with recurrent pregnancy loss

A 38-year-old woman (G4P0221) presents to your office for preconception counseling. Her history is significant for the following: a spontaneous pregnancy loss at 15 weeks' gestation; a pregnancy loss at 17 weeks secondary to preterm premature rupture of membranes (PPROM); a cesarean delivery at 30 weeks and 6 days' gestation after placement of a transvaginal cerclage at 20 weeks for cervical dilation noted on physical exam (the child now has developmental delays); and most recently a delivery at 24 weeks and 4 days due to preterm labor with subsequent neonatal demise (this followed a transvaginal cerclage placed at 13 weeks and 6 days).

How would you counsel this patient?

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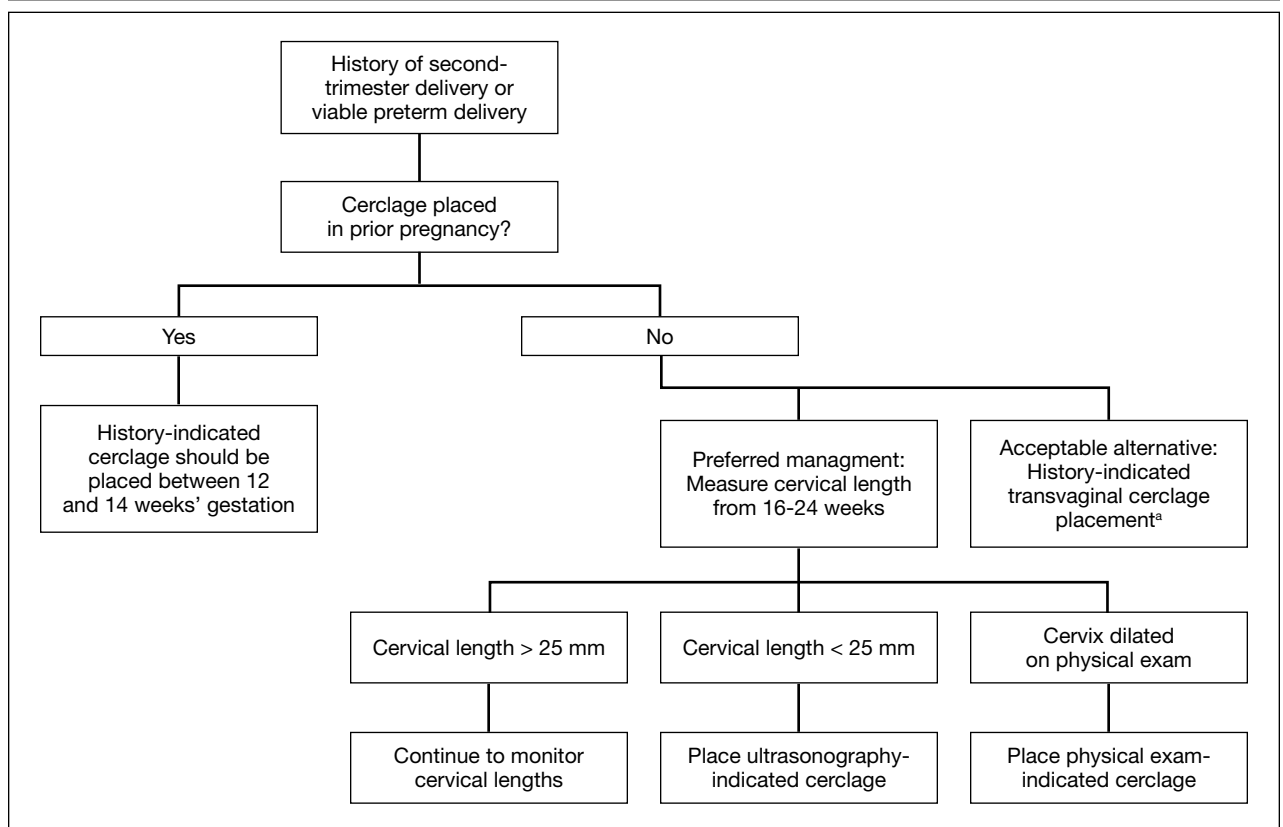
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Cervical insufficiency describes the inability of the cervix to retain a pregnancy in the absence of the signs and symptoms of clinical contractions, labor, or both in the second trimester.¹ This condition affects an estimated 1% of obstetric patients and 8% of women with recurrent losses who have experienced a second-trimester loss.²

Diagnosis of cervical insufficiency is based on a history of painless cervical dilation after the first trimester with expulsion of the pregnancy in the second trimester before 24 weeks of gestation without contractions and in the absence of other pathology, such as bleeding, infection, or ruptured membranes.¹ Diagnosis also can be made by noting cervical dilation on physical exam during the second trimester; more recently, short cervical length on transvaginal ultrasonography in the second trimester has been used to try to predict when a cervical cerclage may be indicated, although sonographic cervical length is more a marker for risk of preterm birth than for cervical insufficiency specifically.^{1,3}

Given the considerable emotional and physical distress that patients experience with recurrent second-trimester losses and the significant neonatal morbidity and mortality that can occur with preterm delivery, substantial efforts are made to prevent these outcomes by treating patients with cervical insufficiency and those at risk for preterm delivery.

FIGURE 1 Decision tree for placement of transvaginal cerclage¹



^aAccording to the American College of Obstetricians and Gynecologists, history-indicated transvaginal cerclage can be placed in the case of a history of 1 or more second-trimester pregnancy losses related to painless cervical dilation even if no cerclage was placed in a prior pregnancy; however, more recently, tracking cervical length has become preferred management as it avoids unnecessary cerclage in one-half of patients.¹

Transvaginal cerclage: A treatment mainstay

Standard treatment options for cervical insufficiency depend on the patient's history. One of the treatment mainstays for women with prior second-trimester losses or preterm deliveries is transvaginal cervical cerclage. A transvaginal cerclage can be placed using either a Shirodkar technique, in which the vesicocervical mucosa is dissected and a suture is placed as close to the internal cervical os as possible, or a McDonald technique, in which a purse-string suture is placed around the cervicovaginal junction. No randomized trials have compared the effectiveness of these 2 methods, but most observational studies show no difference, and one suggests that the Shirodkar technique may be more effective in obese women specifically.⁴⁻⁶

Indications for transvaginal cerclage. The indication for transvaginal cerclage is based on history, physical exam, or ultrasonography.

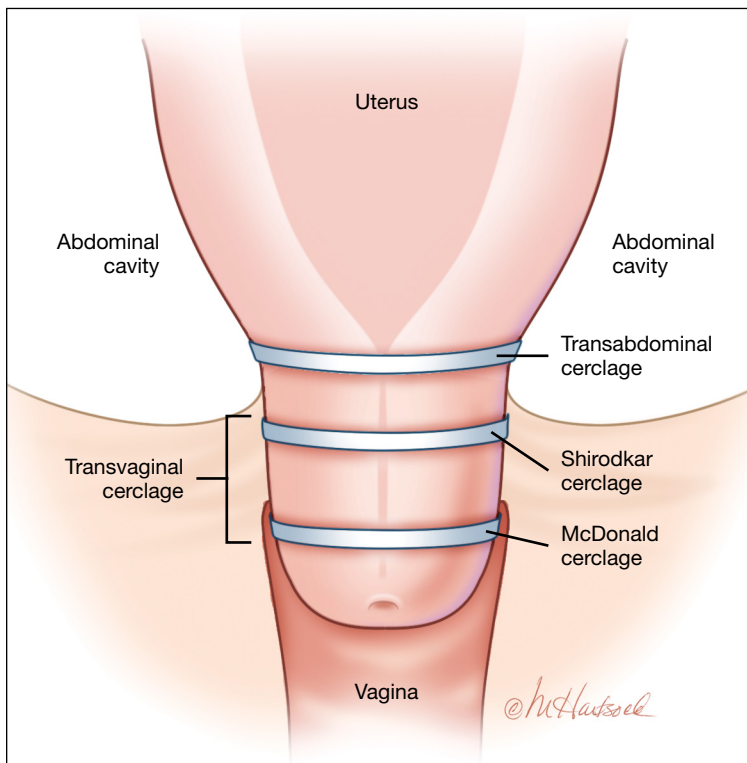
A physical-exam indication is the most straightforward of the 3. Transvaginal cerclage placement is indicated if on physical exam in the second trimester a patient has cervical dilation without contractions or infection.^{1,7}

A history-indicated cerclage (typically placed between 12 and 14 weeks' gestation) is based on a cerclage having been placed in a prior pregnancy due to painless cervical dilation in the second trimester (either ultrasonography- or physical-exam indicated), and it also can be considered in the case of a history of 1 or more second-trimester pregnancy losses related to painless cervical dilation.¹

More recent evidence suggests that in patients with 1 prior second-trimester loss or

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FIGURE 2 Suture placement in transvaginal and transabdominal cerclage procedures



preterm delivery, serial sonographic cervical length can be measured safely from 16 to 24 weeks, with a cerclage being placed only if cervical length decreases to less than 25 mm. By using the ultrasonography-based indication, unnecessary history-indicated cerclages for 1 prior second-trimester or preterm birth can be avoided in more than one-half of patients (FIGURE 1, page 37).^{1,7}

Efficacy. The effectiveness of transvaginal cerclage varies by the indication. Authors of a 2017 Cochrane review found an overall reduced risk of giving birth before 34 weeks' gestation for any indication, with an average relative risk of 0.77.² Other recent studies showed the following⁸⁻¹⁰:

- a 63% delivery rate after 28 weeks' gestation for physical-exam indicated cerclages in the presence of bulging amniotic membranes
- an 86.2% delivery rate after 32 weeks' gestation for ultrasonography-indicated cerclages
- an 86% delivery rate after 32 weeks'

gestation for a history-indicated cerclage in patients with 2 or more prior second-trimester losses.

Success rates, especially for ultrasonography- and history-indicated cerclage, are thus high. For the 14% who still fail these methods, however, a different management strategy is needed, which is where transabdominal cerclage comes into play.

Transabdominal cerclage is an option for certain patients

In transabdominal cerclage, an abdominal approach is used to place a stitch at the cervicouterine junction. With this approach, the cerclage can reach a closer proximity to the internal os compared with the vaginal approach, providing better support of the cervical tissue (FIGURE 2).¹¹ Whether performed via laparotomy or laparoscopy, the transabdominal cerclage procedure likely carries higher morbidity than a transvaginal approach, and cesarean delivery is required after placement.

Since transvaginal cerclage often is successful, in most cases the transabdominal approach should not be viewed as the first-line treatment for cervical insufficiency if a history-indicated transvaginal cerclage has not been attempted. For women who fail a history-indicated transvaginal cerclage, however, a transabdominal cerclage has been proven to decrease the rate of preterm delivery and PPRM compared with attempting another history-indicated transvaginal cerclage.^{11,12}

A recent systematic review of pregnancy outcomes after transabdominal cerclage placement reported neonatal survival of 96.5% and an 83% delivery rate after 34 weeks' gestation.¹³ Thus, even among a population that failed transvaginal cerclage, a transabdominal cerclage has a high success rate in providing a good pregnancy outcome (TABLE, page 40). Transabdominal cerclage also can be considered as first-line treatment in patients who had prior cervical surgery or cervical deformities that might preclude the ability to place a cerclage transvaginally.

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TABLE Cerclage indications and success rates^{8-10,13}

Type of cerclage	Success rates
History-indicated transvaginal cerclage	86% delivery rate after 32 weeks in patients with 2 or more prior second-trimester losses
Ultrasonography-indicated transvaginal cerclage	86.2% delivery rate after 32 weeks in patients with cervical length < 25 mm
Physical-exam indicated transvaginal cerclage	63% delivery rate after 28 weeks when placed with bulging membranes
Transabdominal cerclage	83% delivery rate after 34 weeks in patients with placement for standard indications

CASE Continued: A candidate for transabdominal cerclage

Given the patient’s poor obstetric history, which includes a preterm delivery and neonatal loss despite a history-indicated cerclage, you recommend that the patient have a transabdominal cerclage placed as the procedure has been proven to increase the chances of neonatal survival and delivery after 34 weeks in women with a similar obstetric history. The patient is interested in this option and asks about how this cerclage is placed and when it would need to be placed during her next pregnancy.

10 weeks’ gestation, with a delivery rate at more than 34 weeks’ gestation in 90% versus 74% of patients, respectively.¹⁶

Steps for interval cerclage and during pregnancy

Our practice is to place transabdominal cerclage via conventional laparoscopy as an interval procedure when possible. We find no benefit in using robotic assistance.

For an interval procedure, the patient is placed in a dorsal lithotomy position, and we place a 10-mm umbilical port, 2 lateral 5-mm ports, 1 suprapubic 5-mm port, and a uterine manipulator. We use a flexible laparoscope to provide optimal visualization of the pelvis from any angle.

The first step of the surgery involves dissecting the vesicouterine peritoneum in order to move the bladder inferiorly (**FIGURE 3A**). Uterine arteries are then identified lateral to the cervix as part of this dissection, and a window is created in the inferior aspect of the broad ligament just anterior and lateral to the insertion of the uterosacral ligaments onto the uterus, with care taken to avoid the uterine vessels superiorly (**FIGURE 3B**). Two 5-mm Mersilene tape sutures are then tied together to create 1 suture with a needle at each end. This is then passed into the abdomen, and 1 needle is passed through the parametrial space at the level of the internal os inferior to the uterine vessels on 1 side of the uterus while the other needle is passed through the parametrial space on the opposite side.

Alternatively, rather than using the suture needles, a blunt dissector can be passed through this same space bilaterally (**FIGURE 3C**)

FAST TRACK

One study noted that improved obstetric outcomes occurred with interval placement compared with cerclage placement between 9 and 10 weeks’ gestation, with a delivery rate at more than 34 weeks in 90% versus 74% of patients, respectively

Surgical technique for transabdominal cerclage placement

A transabdominal cerclage can be placed via laparotomy, laparoscopy, or robot-assisted laparoscopy. No differences in obstetric outcomes have been shown between the laparotomy and laparoscopic approaches.^{14,15} Given the benefits of minimally invasive surgery, a laparoscopic or robot-assisted approach is preferred when feasible.

Additionally, for ease of placement, transabdominal cerclage can be placed prior to conception—known as interval placement—or during pregnancy between 10 and 14 weeks (preferably closer to 10 weeks). Because of the increased difficulty in placing a cerclage in the gravid uterus, interval transabdominal cerclage placement is recommended when possible.^{13,16} Authors of one observational study noted that improved obstetric outcomes occurred with interval placement compared with cerclage placement between 9 and

via the suprapubic port and can pull the Mersilene tape through the parametrial space (FIGURE 3D). The suture is then tied anterior at the level of the internal os intracorporally (FIGURE 3E), and the needles are cut off the suture and removed from the abdomen.

To perform transabdominal cerclage when the patient is pregnant, a few modifications are needed to help with placement. First, the patient may be placed in supine position since a uterine manipulator cannot be used. Second, use of a flexible laparoscope becomes even more imperative in order to properly see around the gravid uterus. Lastly, a 5-mm laparoscopic liver retractor can be used to aid in blunt manipulation of the gravid uterus (FIGURE 3F). (A surgical video, accompanying this article at mdedge.com/obgyn, highlights the steps to transabdominal cerclage placement in a pregnant patient.) All other port placements and steps to dissection and suture placement are the same as in interval placement.

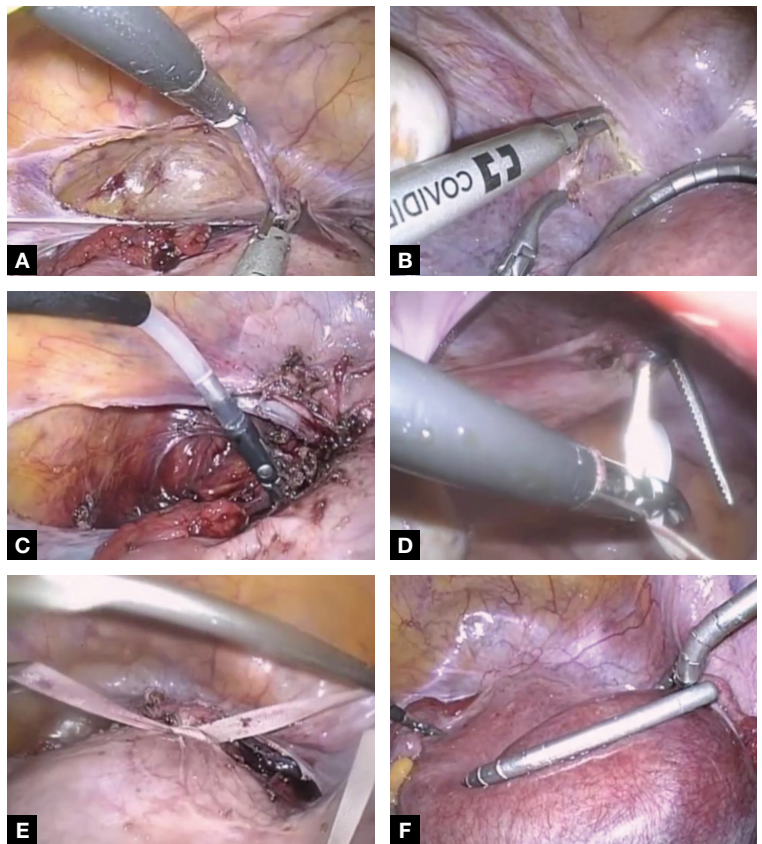
CASE Continued: Patient pursues transabdominal cerclage

You explain to your patient that ideally the cerclage should be placed now in a laparoscopic fashion before she becomes pregnant. You then refer her a local gynecologic surgeon who places many laparoscopic transabdominal cerclages. She undergoes the procedure, becomes pregnant, and after presenting in labor at 35 weeks' gestation has a cesarean delivery. Her baby is born without any neonatal complications, and the patient is overjoyed with the outcome.

Management during and after pregnancy

Pregnant patients with a transabdominal cerclage are precluded from having a vaginal delivery and must deliver via cesarean. During the antepartum period, patients are managed in the same manner as those who have a transvaginal cerclage. Delivery via cesarean at the onset of regular contractions is recommended to reduce the risk of uterine rupture. In the absence of labor, scheduled cesarean is performed at term.

FIGURE 3 Surgical technique for laparoscopic transabdominal cerclage



(A) Dissection of the vesicouterine peritoneum. (B) Creation of window in broad ligament. (C) Passage of blunt dissector through parametrial space. (D) Grasping of Mersilene through parametrial space. (E) Suture is tied anteriorly. (F) Use of liver retractor to manipulate gravid uterus.

Our practice is to schedule cesarean delivery at 38 weeks' gestation, although there are no data or consensus to support a specific gestational age between 37 and 39 weeks. Unlike a transvaginal cerclage, a transabdominal cerclage can be left in place for use in subsequent pregnancies. Data are limited on whether the transabdominal cerclage should be removed in women who no longer desire childbearing and whether there are long-term sequelae if the suture is left in situ.¹⁷

Complications and risks of abdominal cerclage

As the data suggest and our experience confirms, transabdominal cerclage is highly

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successful in patients who have failed a history-indicated transvaginal cerclage; however, the transabdominal approach carries a higher surgical risk. Risks include intraoperative hemorrhage, conversion to laparotomy, and a range of rare surgical and obstetric complications, such as bladder injury and PPROM.^{13,18}

If a patient experiences a fetal loss in the first trimester, a dilation and curettage (D&C) can be performed, with good obstetric outcomes in subsequent pregnancies.¹⁹ If the patient experiences an early-to-mid second-trimester loss, some studies suggest that a dilation and evacuation (D&E) of the uterus can be done with sufficient dilation of the cervix to accommodate up to a 15-mm cannula and Sopher forceps.¹⁹ Laminaria also may be used in this process. However, no data exist regarding success of future pregnancies and transabdominal cerclage integrity after a D&E.²⁰ If the cerclage prevents successful dilation of the cervix, the cerclage must be removed laparoscopically prior to performing the D&E.

In late second-trimester and third-trimester loss, the cerclage must be removed to allow passage of the fetus and placenta prior to a D&E or an induction of labor.²⁰

For patients with PPROM or preterm labor, data are limited regarding management recommendations. However, in these complex cases, we strongly recommend an individualized approach and co-management with maternal-fetal medicine specialists.

CASE Resolved

The cerclage is left in place during the patient's cesarean delivery, and her postpartum course is uneventful. She continued without complications for the next year, at which time she sees you in the office with plans to have another pregnancy later in the year. You counsel her that her abdominal cerclage will still be effective and that she can get pregnant with expectations of similar outcomes as her previous pregnancy. She thanks you for everything and reports that she hopes to return later in the year for her first prenatal visit. ●

FAST TRACK

The transabdominal approach carries a higher surgical risk, including intraoperative hemorrhage, conversion to laparotomy, and rare complications such as bladder injury and PPROM

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