

Laparoscopic Placement and Removal of Abdominal Cerclage: A Case Report

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Abstract

Abdominal cerclage may be recommended in women with a shortened or absent cervix or after failure of a previous vaginal cerclage. If the abdominal cerclage has to be removed prior to delivery of a non-viable fetus, hysterotomy is not necessary. In that case a laparoscopic removal should be considered. We will discuss laparoscopic placement and removal of an abdominal cerclage placed in a 27-year old woman, gravida 10, para 2, abortus 7, who presented at 16 weeks and 6 days gestational age with abdominal cramps and protruding membranes.

Keywords: Laparoscopic cerclage; Preterm labour

Introduction

Cervical incompetence has been treated by cervical cerclage for over sixty years. The transvaginal approach is the most common first-line choice. This method is technically easy to perform and allows for removal close to term and normal vaginal delivery. In 1965, Benson and Durfee [1], described the placement of an abdominal cerclage by laparotomy. This procedure is a good alternative in cases where a vaginal approach is not feasible due to altered anatomy of the cervix or where previous vaginal placement of cervical cerclage had failed [2]. Despite the advantages of an abdominal approach, laparotomy remains to be an invasive procedure. In addition, the delivery of the baby after abdominal cerclage is always done by cesarean section. To avoid two laparotomies a laparoscopic and hence less invasive approach for cerclage placement has been described [3]. Both approaches appear to be equally effective for obstetric outcome [4].

If removal of the cerclage is required in case of an unviable pregnancy, laparoscopy can be considered as a hysterotomy is not desirable in that case. This case report describes the laparoscopic placement and removal of an abdominal cerclage.

Case Report

A 27-year old woman, G10 P2 A7 presented at 16 weeks and 6 days Gestational Age (GA) with protruding membranes. Her obstetric history included 1 molar pregnancy and 5 early miscarriages. She had an expulsion at 16 weeks GA after painless dilation, most probably due to cervical insufficiency. In the next pregnancy, an elective cerclage was placed by transvaginal approach and vaginal progesterone tablets were used. At 21 weeks GA she presented with pelvic pressure and premature rupture of the membranes. Considering the gestational age and the poor prognosis, the cerclage was removed and she delivered that same day. In the subsequent pregnancy a transvaginal cervical cerclage was performed for the second time. Due to premature contractions, this cerclage had to be removed at 21 weeks GA and the patient delivered one day later.

Before the next pregnancy, the possibility of an abdominal cerclage was discussed with the patient. After informed consent, an uncomplicated laparoscopic placement was performed using a technique described by Gebruers et al. [5].

The patient was placed in dorsal lithotomy position under general anesthesia. A subumbilical incision for the laparoscope was made using the closed Verres technique. Two more trocars were placed, one in the right and one in the left lower abdominal quadrant. A solution with vasopressine was injected under the peritoneum of the uterovesical

reflection and lateral of the lower uterus. Subsequently, branches of the uterine artery and vein were identified, allowing for the cardinal ligament to be perforated from anterior to posterior in an avascular area on the median side of the uterine vessels on both sides by a straight atraumatic clamp. The perforation at the posterior side was medially from the uterosacral ligament. A polyester tape (5 mm Mersilene®) without needles was passed into the pelvis and pulled through the holes with both free ends of the tape at the anterior side. Finally, three knots were made at the anterior side of the uterus resulting in a tension free loop around the cervix above the insertion of the uterosacral ligament. The peritoneum was not closed over the knot.

A few weeks later, pregnancy was confirmed. At 16 weeks and 6 days GA she presented with complaints of pelvic pressure, abdominal cramps and spotting. A cervical inspection showed protruding membranes and cervical blood loss. To prevent a cervical rupture, laparoscopic removal of the cerclage was performed.

The patient was placed in dorsal lithotomy position and a subumbilical incision of 5 mm was made. The abdomen was inflated through a Verres needle with a pressure limit set at 15 mmHg. The scope was introduced via the umbilical port. Under visualization, two further ports of 5 mm were placed at the same position as during cerclage placement in the left and right iliac fossa.

The bladder was carefully detached from the knot and the Mersilene® suture appeared. There was no need to manipulate the uterus. The knot was clamped and the suture was cut next to the knot. The suture was removed by gentle traction without tissue damage or blood loss.

The unviable fetus was spontaneously expelled immediately after surgery.

Discussion

In most cases, surgical treatment of cervical incompetence consists

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Cerclage placement before pregnancy	Cerclage placement during pregnancy
Suture insertion easier due to better visualization and possibility of uterus manipulation	Suture insertion more challenging because of limited visualization and no use of uterus manipulator. Between 10- and 12-week gestation more clearly delineated tissue planes and more accurate placement possible (8)
Normal risk of bleeding	Higher risk of bleeding
Normal use of painkillers	Limited use of painkillers
Unnecessary risk of operation when not becoming pregnant or having a miscarriage	Placement possible after screening for aneuploidy or after high risk period of early miscarriage
Lower number of second- and third-trimester losses	Higher number of second- and third-trimester losses

Table 1: (dis)advantages abdominal cerclage placement before or during pregnancy.

Author	Age	G#P#A#*	Term of placement	Term of removal	Reason for removal	Operation related complications
Agdi et al. [9]	26	G3P0A2	Pre-pregnancy	19 weeks	Ruptured membranes	None
Carter et al. [12]	32	G6P0A5	13 weeks	17 weeks	Fetal death (4 weeks after ruptured membranes)	Premature, preterm rupture of membranes (after placement)
Carter et al. [13]	39	G4P0A3	Pre-pregnancy	19 weeks	Ruptured membranes	None
Scarantino et al. [14]	32	G3P0A2	11 weeks	16 weeks	Fetal death after ruptured membranes	Uncomplete removal

Table 2: Laparoscopic removal of a laparoscopic-placed cerclage.

of placing a stitch around the cervix. The transvaginal approach is still the most common first-line choice. A possible alternative is the transabdominal placement of this suture. This method is specifically recommended in the small subgroup of women for whom transvaginal placement of the suture is technically difficult or impossible. Also women who have had a preterm delivery despite a transvaginal cerclage in a previous pregnancy should be considered for this procedure [6-8]. Davis et al. [2] conducted a retrospective cohort study reporting on women who had undergone either a transabdominal or a transvaginal prophylactic cerclage after ≥ 1 prior failed transvaginal cerclage. Forty transabdominal and 24 transvaginal cerclage pregnancies were analyzed. Preterm delivery, under 35 weeks, was less common in the abdominal group than in the vaginal group (18% vs 42%, $p=0.04$), as for preterm delivery under 33 weeks (10% vs 38%, $p=0.03$). In comparison with transvaginal cerclage they also reported a lower incidence of preterm premature rupture of membranes after transabdominal cerclage, though this may be associated with a higher risk of serious operative complications in the latter procedure.

Besides a more favorable outcome, other advantages of the abdominal approach include no slippage of the suture, absence of a foreign body inside the vagina that could predispose for ascending infection and premature labor, and the ability to leave the suture in place between pregnancies [9]. In this case the cerclage was placed before and not during pregnancy. In a systematic review Burger et al. [10] describes a lower number of perioperative complications and of second- and third-trimester losses when a cerclage is placed before pregnancy. However, these conclusions should be interpreted with caution; data on limited number of studies is available. Additionally, a substantial number of patients receiving a cerclage placed before pregnancy might not become pregnant or may have an early miscarriage in the subsequent pregnancy.

Considering the arguments mentioned above, it is important to discuss the advantages and disadvantages of timing of the procedure, when counseling women for abdominal cerclage placement (Table 1).

Ades et al. [4] compared the obstetric outcomes of cerclage through laparotomy versus laparoscopy. Their study showed no statistically significant differences between both groups. The laparoscopy group had significantly lower surgical morbidity, which was mainly driven by a reduced hospital stay. The latter was supported by Ghomi et al. [11] who described hospital stays ranging from 4 to 7 days after laparotomy compared to 23 hours after laparoscopy. Burger et al. [10]

performed a systematic review to study the effectiveness of abdominal cerclage placed via laparotomy or laparoscopy, concluding it was not possible to differentiate which method is superior. A review of literature resulted in identification of 4 cases reporting laparoscopic removal of a laparoscopic-placed cerclage [9,12-14]. Removal was reported between 16 and 19 weeks of gestation (Table 2).

An important technical aspect of the case reported here was the placement of the trocars. In our case, the two lateral ports were placed at a lower level compared to the cases in literature allowing us to use the incisions of the first operation.

Carter et al reported two cases, one at 17 weeks GA [12] and one at 19 weeks GA [13]. In both cases, 4 ports were placed. The primary trocar was placed under visualization through the umbilicus and in both cases a 5 mm port was placed suprapubic. The two lateral 5 mm ports were placed at different positions in each case. At 17 weeks GA these were placed at the level of the umbilicus and at 19 weeks GA placement was slightly above the level of the umbilicus.

Agdi et al. [9] described a placement of the primary trocar about 3 cm above the umbilicus at 19 weeks GA. Two lateral secondary trocars were introduced at the same level.

The cerclage knot was placed and cut at the anterior side of the cervix in all cases, except for the case described by Scarantino et al. [14] where the knot of the cerclage was located posteriorly. Visualization of the cerclage was obtained by transvaginal uterine manipulation and gentle support with an endoscopic retractor. Complete removal was yet impossible because of scar tissue.

Conclusion

When it is necessary to remove an abdominal cerclage in an unviable pregnancy, laparoscopic approach can be considered.

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