Abdominal cerclage revisited

Col Devendra Arora*, Sqn Ldr Navneet Magon†, Col Manash Biswas#, Brig S Chopra, VSM**

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INTRODUCTION

Since the initial description in 1658 of the cervix being 'so slack that it cannot keep in the seed' by Cole and Culpepper¹ few subjects in obstetrics have generated as much controversy as the term 'cervical incompetence', or as more recently referred 'cervical insufficiency'. The incidence of cervical insufficiency in the general obstetric population is reported to vary from 1:100 to 1:2,000.^{2–4} In patients with a hypoplastic cervix, such as those exposed to diethylstilboestrol (DES) in utero, history of a large cervical conisation or a prior history of failed vaginal cerclage, an abdominal cerclage has been recommended.⁵ A case of cervical insufficiency treated with transabdominal cerclage (TAC) placement is reported for the rarity of the procedure performed.

CASE REPORT

A 32-year-old women, gravida 9, abortions 8, reported at seven weeks four days period of gestation. She was a known case of antiphospholipid antibody syndrome (APLA) with bad obstetric outcomes. She was investigated for APLA syndrome in her eighth pregnancy when she was found positive for anticardiolipin antibodies. Her previous menstrual cycles were regular. The last menstrual period was on 12 December 2008 with expected date for delivery being on 19 September 2009. Her relevant obstetric history was as follows:

- Gravida₁: Seven years back, twin pregnancy, spontaneous abortion at 18 weeks period of gestation, managed at a civil hospital.

- Gravida₂: Six years back, spontaneous abortion at 12 weeks gestation, managed at a civil hospital.
- Gravida₃: Five years back, spontaneous abortion at 20 weeks gestation, managed at a peripheral military hospital.
- Gravida₄: Four years back, transvaginal cerclage given, spontaneous abortion at 16 weeks gestation, managed at a peripheral military hospital.
- Gravida₅: Three years back, spontaneous abortion at 14 weeks gestation, cerclage planned, could not be given as patient developed inevitable abortion, managed at a military tertiary care centre.
- Gravida₆: Three years back, transvaginal cerclage was given at 14 weeks gestation, spontaneous abortion at 18 weeks gestation, managed at a military tertiary care centre.
- Gravida₇: Two years back, transvaginal cerclage given at 14 weeks gestation, developed dilatation of cervix followed by prolapsed membrane with cerclage and a reinforcing second cerclage was given at 22 weeks gestation. The patient spontaneously aborted at 23 weeks gestation in civil tertiary care hospital.
- Gravida₈: 2008, diagnosed as a case of APLA syndrome, managed with injection low molecular weight heparin (LMWH) and ecosprin, transvaginal cerclage was given, spontaneously aborted at 24 weeks gestation, managed at our centre.
- Gravida₉: Present pregnancy.

She reported to our centre at seven weeks four days gestation in the present pregnancy. The foetal cardiac activity and dating of pregnancy was confirmed by sonography. She was screened for APLA, diabetes, and congenital foetal anomalies, apart from standard antenatal investigations. She was started on treatment with injection LMWH, tablet ecosprin, tablet folic acid, and micronized progesterone. A combination pessary containing clindamycin with clotrimazole was also started to prevent vaginal infection. This pessary was given for a week and then repeated monthly for a week. On per speculum examination there was no portio vaginalis of cervix except for a small tag of post-lip of cervix. Her cervical length (CL) was measured by vaginal sonography at 12 week gestation and it was detected to be 13 mm (Figure 1). In view of repeated mid-trimester abortions and multiple failed transvaginal cerclage, an abdominal cerclage was placed after laparotomy with 5 mm merselene tape at the level of internal optic sheath (os) with knot anterior to cervix on 14 March 2009 under spinal anaesthesia at 13 weeks gestation (Figure 2). Intra-operatively there

*Senior Advisor (Maternal Foetal Medicine & Obstetrics & Gynaecology), Command Hospital (WC), Chandimandir, Panchkula, Haryana, †Graded Specialist (Obstetrics & Gynaecology), 7 Air Force Hospital, C/o 56 APO, #Senior Advisor (Obstetrics & Gynaecology), Command Hospital (AF), Bengaluru – 560007, **Brig (Training), AFMC, Pune – 40.

Correspondence: Col Devendra Arora, Senior Advisor (Maternal Foetal Medicine & Obstetrics & Gynaecology), Command Hospital (WC), Chandimandir, Panchkula, Haryana.
E-mail: drdarora@hotmail.com

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Figure 1 Vaginal sonography showing 13 mm cervix between the two arrows: pre-operative sonograph.

Figure 3 Post-abdominal cerclage vaginal sonography showing cervix increased to 35 mm as shown between two small arrows with mersilene tape in situ appearing as echogenic spots on the cervix. OS: optic sheath.

Figure 2 Knot being tied anteriorly in the mersilene tape intra-operatively.

Figure 4 Vaginal sonography showing beaking of internal optic sheath at 27 weeks gestation shown by the arrow with abdominal cerclage in situ.

was an arterial bleed on the left posterior membrane of broad ligament while placing the merselene tape. It was controlled with placement of suture and surgical haemostatic sponge. Postoperative period was uneventful. Cervical length was measured by vaginal sonography on second day of surgery and it had increased to 35 mm (Figure 3). She was discharged on tenth day of surgery with an advice for regular antenatal check-ups. Vaginal sonography was done regularly every four weeks to assess the state of the cervix. At 27 weeks gestation, beaking of cervix was seen on vaginal sonography. Cervical length reduced to 32 mm and diameter of internal os was 8 mm (Figure 4). The patient was admitted and surfactant induction with injection dexamethasone was given in view of high-risk for preterm delivery. She was put on bed rest and managed conservatively. She responded to conservative management and was finally delivered by an elective term lower uterine segment caesarean section (LUSCS/LSCS) 29 August 2009 at 37 weeks gestation. A healthy female baby was delivered weighing 2.68 Kg with normal Activity, Pulse, Grimace, Appearance, and Respiration (APGAR). Intra-operatively during caesarean, no adhesions were found at the site of placement of the abdominal

cerclage by merselene tape. The tape was left in situ to help the patient for conserving her future pregnancies. Postoperative period was uneventful and the patient was discharged on the sixth postoperative day with a healthy female baby (Figure 5).

DISCUSSION

Cervical surgery to prevent recurrent pregnancy loss was introduced in 1902 by Herman,⁶ when he reported on his experience of three patients treated by Emmet trachelorrhaphy. In 1955 Shirodkar⁷ and later in 1957 McDonald⁸ introduced methods of transvaginal cerclage to treat cervical incompetence. Despite minor modifications, these procedures have remained the mainstay of therapy to prevent recurrent pregnancy loss.

Cervical insufficiency has been defined as a physical deficit in the strength of the cervical tissue that is either congenital or acquired. Cervical insufficiency has been traditionally diagnosed by the historic criteria of painless dilation of the cervix, recurrent early preterm delivery (before 32 weeks) or second trimester loss, and progressively earlier delivery with

Figure 5 The couple with the baby.

each subsequent pregnancy. In the 1990s, with the advent of transvaginal ultrasound and CL measurement, sonographic criteria were developed to diagnose cervical insufficiency. This included a short closed CL, dilation of the internal os, and prolapse of the membranes into the endocervical canal (funneling or beaking). In addition, exacerbations of these findings with transfundal pressure were also considered a hallmark of this disease.⁹ Treatment for the diagnosis of cervical insufficiency has traditionally used a cerclage procedure. The different types of cerclage can be classified with respect to timing in gestation and anatomic approach. Kurup and Goldkrand¹⁰ classified the timing of cerclage as being elective, urgent, or emergent. Elective cerclage is defined as placement in the late first trimester or early second trimester (usually <16 weeks gestational age), after viability has been established, and the absence of gross congenital anomalies (e.g. anencephaly) has been ensured. This type of cerclage is placed before the development of any signs or symptoms of cervical insufficiency. The anatomic approaches to cerclage placement can be from the transvaginal or transabdominal route, with transvaginal being the most common approach. The evidence for TAC is based on multiple small case series.^{11–13} The indications for a transabdominal procedure include a congenitally or surgically absent or damaged ectocervix or failed transvaginal procedures. Novy et al¹² have reported extensive experience with this procedure, with low morbidity and favourable outcome. This retrospective study has demonstrated that perinatal outcome seems to be improved in patients with prior failed transvaginal cerclage when using the transabdominal approach. The repeat transvaginal approach in prior failed transvaginal cerclage is not advocated.¹³ Fick et al recently in 2007 reported outcome of cohort study of pregnant women referred for a transabdominal cerclage between 1978 and 2004.¹⁴ A foetal salvage rate prior to TAC of 18% and 93% after the procedure ($P<0.001$) was observed. Delivery beyond 37 weeks occurred in 70% of pregnancies. Maternal age, prior cerclage history, associated factors for TAC, or previous delivery of a viable infant did not predict the failures of the pregnancies. It was observed in this study that women with TAC had a higher rate of successful pregnancies than prior to

TAC. Similar results have also been reported by Debbs et al in different cohort of patients in the same year.¹⁵

Transabdominal cerclage is usually placed with timing similar to elective cerclage during the pregnancy or it can be placed before pregnancy. However, there is concern for cervical stenosis and infertility with this modification in timing.¹⁶ Recently in 2009, operative laparoscopy is reported by Carter et al¹⁷ as a safe and effective alternative to laparotomy for the placement of abdominal cerclage. However, recently Groom et al¹⁸ described this procedure as an interval cerclage in the non-pregnant state with subsequent good pregnancy outcome. Advantages of an interval procedure include avoidance of laparotomy in pregnancy and less bleeding morbidity. Disadvantages include inability to become pregnant and the difficulties of pregnancy management if a miscarriage results in first trimester. Therefore, this procedure is usually done between 11 weeks and 14 weeks of pregnancy. The procedure requires a laparotomy. A bladder flap is created, and a merselene tape is placed at the level of the junction between the lower uterine segment and the cervix, lateral to the uterus and medial to the uterine vessels. The surgeon grasps the uterine vessels and retracts them laterally, exposing an avascular space between the artery and the cervix. A right angle clamp is passed anteriorly to posterior through this avascular space, tenting, and incising the posterior leaf of the broad ligament and grasping a merselene tape that is brought back through the space. The same procedure is repeated on the opposite side, and the tape is tied anteriorly (Figure 4). A placement of abdominal cerclage in such a way to place the knot posteriorly is a possibility but not described clearly in literature. Caesarean delivery is necessary if the suture is required to be left in place. In cases of pregnancy complications requiring mid-trimester delivery then a posterior colpotomy and cutting the tape to allow vaginal delivery or hysterotomy is performed for leaving the suture intact. Zaveri et al¹⁹ evaluated fourteen studies to compare the outcomes of pregnancy after TAC vs transvaginal cerclage in patients with a failed transvaginal cerclage during a previous pregnancy. On evaluation of these studies it was observed that TAC may be associated with a lower risk of perinatal death or delivery at <24 weeks of gestation, but it may be associated with a higher risk of serious intra-operative complications as compared to transvaginal cerclage. We also noticed arterial bleed in this case due to close proximity of uterine vessels to the merselene tape.

In this reported case the patient had a miraculous favourable perinatal outcome with pregnancy reaching till term despite cervix showing unfavourable changes in mid-trimester. Thus, TAC is a relevant procedure in selected group of patients with cervical insufficiency. Transabdominal cerclage has a definite role in management of recurrent mid-trimester losses in modern obstetrics as it helps in a favourable perinatal outcome in selected cohort of patients but requires surgical skill.

CONFLICTS OF INTEREST

None identified.

REFERENCES

1. Culpepper N, Cole A, Rowland W. *The Practice of Physick*. London: George Strawbridge 1678:502.
2. Barter RH, Dusbabek JA, Riva HL, Parks JL. Surgical closure of the incompetent cervix during pregnancy. *Am J Obstet Gynecol* 1958; 75:511–521; discussion:521–524.
3. Jennings CL. Temporary submucosal cerclage for cervical incompetence: report of forty-eight cases. *Am J Obstet Gynecol* 1972;113:1097.
4. Kuhn R, Pepperell R. Cervical ligation: a review of 242 pregnancies. *Aust NZ J Obstet Gynaecol* 1977;17:79–83.
5. Novy MJ. Transabdominal cervicoisthmic cerclage for the management of repetitive abortion and premature delivery. *Am J Obstet Gynecol* 1982;143:44–54.
6. Herman GE. Emmet's operation as a prevention of abortion. *J Obstet Gynaecol Br Common* 1902;2:256–257.
7. Shirodkar VN. A new method of operative treatment for habitual abortions in the second trimester of pregnancy. *Antiseptic* 1955;52: 299–300.
8. McDonald IA. Suture of the cervix for inevitable miscarriage. *J Obstet Gynaecol Br Emp* 1957;64:346–350.
9. Guzman ER, Houlihan C, Vintzileos A. Sonography and transfundal pressure in the evaluation of the cervix during pregnancy. *Obstet Gynecol Surv* 1995;50:395–403.
10. Kurup M, Goldkrand JW. Cervical incompetence: elective, emergent, or urgent cerclage. *Am J Obstet Gynecol* 1999;181:240–246.
11. Cammarano CL, Herron MA, Parer JT. Validity of indications for transabdominal cervicoisthmic cerclage for cervical incompetence. *Am J Obstet Gynecol* 1995;172:1871–1875.
12. Novy MJ. Transabdominal cervicoisthmic cerclage: a reappraisal 25 years after its introduction. *Am J Obstet Gynecol* 1991;164:1635–1641; discussion:1641–1642.
13. Davis G, Berghella V, Talucci M, et al. Patients with prior failed transvaginal cerclage: a comparison of obstetric outcomes with either transabdominal or transvaginal cerclage. *Am J Obstet Gynecol* 2000;183:836–839.
14. Fick AL, Caughey AB, Parer JT. Transabdominal cerclage: can we predict who fails? *J Mat Fetal Neonatal Med* 2007;20:63–67.
15. Debbs RH, DeLa Vega GA, Pearson S, Sehdev H, Marchiano D, Ludmir J. Transabdominal cerclage after comprehensive evaluation of women with previous unsuccessful transvaginal cerclage. *Am J Obstet Gynecol* 2007;197:317.
16. Norwitz ER, Lee DM, Goldstein DP. Transabdominal cervicoisthmic cerclage: learning to tie the knot. *J Gynecol Tech* 1996;2:49–54.
17. Carter JF, Soper DE, Goetzl LM, Van Dorsten JP. Abdominal cerclage for the treatment of recurrent cervical insufficiency: laparoscopy or laparotomy? *Am J Obstet Gynecol* 2009;201:111.
18. Groom KN, Jones BA, Edmonds DK, Bennett PR. Preconception transabdominal cervicoisthmic cerclage. *Am J Obstet Gynecol* 2004; 191:230.
19. Zaveri V, Aghajafari F, Amankwah K, Hannah M. Abdominal versus vaginal cerclage after a failed transvaginal cerclage: a systematic review. *Am J Obstet Gynecol* 2002;187:868.