

Case Report

Preconception Laparoscopic Cervical Cerclage: The Preferred Technique for Cervical Incompetence?

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Objective: To explore the ease and effectiveness of placing a cervical suture preconception using a laparoscopic technique.

Design: A case study with systematic literature review.

Setting: PIVET Medical Centre, a private facility providing comprehensive services over 35 years in gynaecology, andrology and reproductive endocrinology for infertility and recurrent pregnancy loss.

Patients: Case report of a 35 year old woman with recurrent mid-trimester pregnancy losses and well-defined cervical incompetence.

Intervention: Preconception placement of cervical suture by laparoscopic trans-abdominal cerclage (LTAC) as a day case.

Main outcome measure: Details of ensuing pregnancy.

Results: Conception without delay and normal pregnancy with delivery by elective caesarean section near term of healthy 2645 g female infant.

Conclusion: We are impressed with the ease of the LTAC technique which appears likely to have fewer complications than traditional vaginal techniques, as well as speedier recovery compared to a laparotomy approach.

Keywords: Laparoscopic cervical cerclage; Cervical incompetence; Vaginal technique; Laparotomy technique; Transabdominal cervical cerclage

Introduction

Cervical incompetence is defined as inability of the uterine cervix to retain a pregnancy in the second trimester, in the absence of contractions as outlined by The American College of Obstetrics and Gynecology [1]. The lack of a confirmatory diagnostic test as well as absence of a universally accepted definition of cervical incompetence puts diagnosis of this condition totally in a clinical perspective. A classical history of painless dilatation and cervical shortening after the first trimester in the absence of preterm labour with subsequent expulsion of products of conception and no underlying evidence of co-existing pathology (such as infection, ruptured membranes, congenital chromosomal anomalies or intra-uterine bleeding) is indicative of cervical incompetence. Cervical incompetence is estimated to complicate between 0.1% to 2% of all pregnancies and accounts for 15% of habitual preterm deliveries between 16 and 28 weeks of gestation [2].

Shirodkar [3] described the first cervical cerclage suture in 1955. This technique involved vaginal placement of suture high over the cervix, reflecting the bladder and burial of the knot. Elective Caesarean section was recommended as the stitch was not easily removed. Western Australia born McDonald [4] modified and simplified this technique, reporting from Melbourne in 1957. His technique involved a purse string stitch inserted at a lower level than the Shirodkar suture, without dissection and leaving the knot exposed. This knot could be removed at 37 weeks to facilitate vaginal delivery. Since its first description in 1965 [5], trans-abdominal cervical cerclage prior to pregnancy has emerged as a safe and effective intervention for improving outcomes [6-9]. Recently, the laparoscopic approach has taken this procedure a step further by reducing hospital stay as well as showing the potential to improve pregnancy related outcomes. Hence, we report an interesting

case of laparoscopic pre-conception cervical cerclage resulting in a positive outcome both for the mother and baby.

Case Description

A 35 year old woman, gravida 4 para 1 presented to our practice with previous history of spontaneous onset preterm labour at 26 weeks in her first pregnancy. She underwent Caesarean section as the baby presented as footling breech with rupture of membranes. Her antenatal ultrasound scans were suggestive of a bicornuate uterus. Subsequently, as a part of investigation for underlying chronic pelvic pain, she underwent hystero-laparoscopy and excision of endometriosis. During this procedure, she was noted to have a septate uterus. As a follow up procedure at PIVET, she had a hysteroscopic complete septal resection for a 6 cm long broad based septum under laparoscopic guidance. At that procedure her cervix was noted to be patulous and partially open with easy passage of an 8 mm Hegar dilator. Within two years of this procedure, she conceived spontaneously and had elective McDonald's cervical stitch placed at 12 weeks following a normal first trimester

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screen (FTS). However four weeks later she developed spontaneous rupture of membranes, following which the cervical suture was removed with consequent spontaneous miscarriage. Thereafter, she presented with two episodes of delayed miscarriages in a span of 12 months, despite the concomitant use of medroxyprogesterone acetate tablets 20 mg thrice a day as per PIVET's long-standing protocol for recurrent pregnancy loss [10,11]. Hence, the decision to perform preconception laparoscopic cervical cerclage was taken.

At examination under anaesthesia, the cervical os was noted to be patulous, easily admitting an 8 mm Hegar dilator. The pelvic features were otherwise normal. A Spackman cannula was placed for uterine manipulation and 4-port laparoscopy was performed. Noting normal pelvic features the utero-vesical fold was opened anteriorly and the bladder was reflected caudally. From the posterior aspect, the uterine artery was identified and a window was created in the broad ligament in an avascular plane at a position medial and distal to the uterine artery ensuring the ureters were clearly sighted laterally. These 5-6 mm broad ligament windows were created on both sides at a level just inferior to the uterine isthmus. A 5 mm Mersilene tape (non-absorbable polyester braided suture; Ethicon, Johnson & Johnson, USA) with needles removed was passed through these windows from the anterior aspect bilaterally (Figure 1) ensuring that the free ends lay posteriorly. Intracorporeal suturing was performed creating a knot at the posterior aspect of the uterus at the level of the utero-sacral crus (Figure 2). Post-

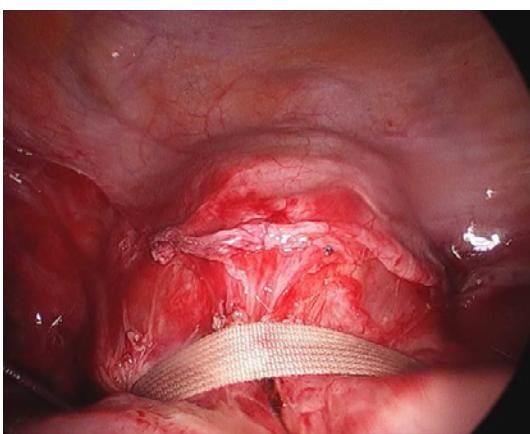


Figure 1: Mersilene tape placed at cervico-isthmic junction after opening the utero-vesical fold and reflecting the bladder caudally.

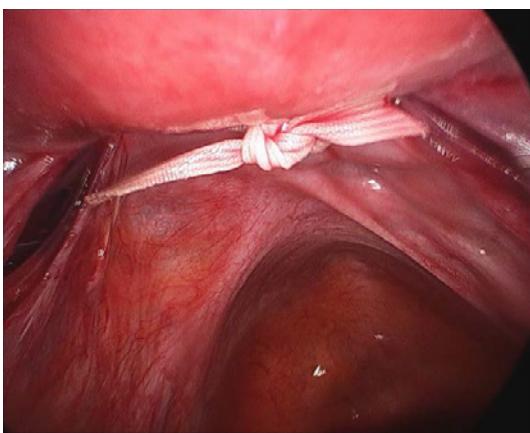


Figure 2: Mersilene tape tied posteriorly at the level of the utero-sacral crus on the supravaginal part of the cervix.

procedure, bilateral ureteric vermiculation and well perfused uterus were confirmed visually. Postoperatively, the patient recovered well and was discharged home the same evening, 6-hours post-procedure.

This patient had one normal period after surgery and conceived spontaneously. At anatomy scan, cervical length was 3.3 cm which remained unchanged at third trimester scans. At 36+3 weeks, she presented in early labour and had elective caesarean section with delivery of a lusty female infant weighing 2654 g. At the caesarean section the Mersilene tape was clearly seen at the level of the isthmus posteriorly with intact knot, without any reactionary adhesions. Anteriorly, it was totally invisible being covered inside the utero-vesical fold. The tape was removed from the posterior aspect as the woman requested this and was not desiring a future pregnancy. Her postoperative recovery was entirely uneventful.

Ethical Issues

PIVET Medical Centre and Cairns Fertility Centre are both accredited by the Reproductive Technology Accreditation Committee with annual scrutiny of all cases proceeding into assisted reproductive procedures. Clinical processes are considered by Bellberry Human Research Ethics Committee since 2004 with the most recent site visit in October 2014, for review 2016; whilst academic research projects are considered by Curtin University Ethics Committee. This case report is approved by Bellberry under general ethical considerations for clinical and operative procedures including patient information documentation for informed consent, P1009a as well as Curtin approving the publication of this retrospective data with approval number RD_25-15.

Discussion

Laparoscopic transabdominal cerclage (LTAC) is a procedure where a suture is placed around the cervix at its uppermost part at the cervico-uterine transition where the uterine isthmus forms. It compares favourably with the laparotomy approach to cerclage [12-15] but with the full benefits of a brief laparoscopic operation. The cervico-isthmic level, being the site of placement for the LTAC cannot be easily reached through a vaginal approach without major dissection or clear perception of anatomy, hence the laparoscopic approach offers greater advantage with reduced hospital stay. Risk factors are similar to any other minor pelvic laparoscopic procedure and we would believe the risk of suture-site infection is reduced as there is no exposure to vaginal flora.

LTAC is indicated if the cervix is fore-shortened eg. post-cone biopsy; or irregular from obstetric trauma; or if there has been a previous preterm pregnancy/ foetal loss in the absence of uterine contractions; or a history of a failed transvaginal cerclage [16]. Our patient fulfilled all the above criteria for prerequisites to this procedure. Ideally, it is to be performed pre-pregnancy due to the physiologic advantages of a small, minimally vascular uterus where manipulations can be performed readily and safest. However, we would believe LTAC can also be performed up to 14 weeks gestation after normal FTS, when pregnancy is classified as ongoing. The benefits include reduced potential of migration of the inert suture due to its proximal placement. This technique also avoids the presence of foreign body in vagina, which could be a potential source of cervico-vaginal infection, causing chorioamnionitis and precipitating premature rupture of membranes and preterm labour. In addition, the suture can be left intact for future pregnancies. It does not affect future fertility status. In situations like early miscarriages, it does not affect the ability to perform dilatation and curettage (D&C) as the suture is not extremely tight. The only disadvantage of this procedure is that caesarean section is recommended

as removing this suture vaginally is practically impossible and should not be attempted. We suspect it could be removed laparoscopically and in the event of mid-trimester foetal demise, hysterotomy would be recommended.

The current evidence conflicts with the British RCOG (Royal College of Obstetricians and Gynaecologists) recommendations [17] stating that "There is no evidence to support laparoscopy over laparotomy for the insertion of abdominal cerclage." However, a recent systematic review by Tulandi et al. [18] from Canada evaluated 16 studies of abdominal cerclage (N=678 cases) and concluded that the rates of third trimester delivery and live birth after abdominal cerclage via laparoscopic approach were higher and comparable to those via laparotomy. They also concluded that pre-conception cerclage was more pragmatic and preferable than post-conception.

Conclusion

In conclusion, we present this case of LTAC as few cases have so far been reported. However given our long experience in managing infertility and recurrent fetal wastage, we have been impressed with the simplicity and ease of application of this procedure. There appear to be obvious benefits over existing trans-vaginal and trans-abdominal management strategies. We will increasingly explore LTAC and encourage other gynaecologists managing similar cases.

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