

SHORT REPORT

Pre-pregnancy transabdominal cerclage

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Abstract

A consecutive series of 45 women with one or more previous second trimester deliveries, who had a pre-pregnancy transabdominal cerclage (TAC) from 1999 to July 2007, was followed until January 2008.

Within the observation period 50 pregnancies occurred in 36 women. Seven resulted in first trimester abortions, none in second trimester abortions or deliveries, and six were on-going pregnancies. In the remaining 37 pregnancies the fetal salvage rate was 100%, and cesarean section was performed after 34 weeks (mean 36+5 weeks) in 36 (97%) pregnancies. One woman had three successful pregnancies following the procedure. No serious complications were associated with the application of TAC. One woman had a hysterectomy following cesarean section.

Pre-pregnancy TAC is a procedure with few complications and excellent outcome. The method may be considered in women with a second trimester fetal loss, when cervical incompetence cannot be ruled out.

Key words: *Transabdominal cerclage, cervical incompetence, fetal loss*

Introduction

Cervical cerclage has been a common and a frequently used treatment for several years. In 1950 (1), transvaginal cerclage (TVC) was applied for the first time. The first transabdominal cerclage (TAC) was placed in 1965 (2). Now TAC is performed increasingly and it is often the preferred method for treatment of patients with cervical incompetence. Most published studies include patients who had TAC inserted in early pregnancy (3–5). A few small studies have assessed the value of pre-pregnancy TAC (6,7).

Usually, one or more unsuccessful TVC has been required before TAC was considered (8). In recent years, the procedure has been extended to patients with a diagnosis of classical cervical incompetence without previous TVC (4,5).

In the present series, TAC was offered to patients with a single second trimester loss even in the absence of a history typical for cervical incompetence and in some cases without a prior TVC attempt. There are no controlled trials of pre-pregnancy abdominal cerclage, and only small descriptive studies have been

published (6,7). Therefore, we present the results of a larger consecutive series of TAC application before pregnancy.

Material and methods

The material consists of a consecutive series of all women who had a pre-pregnancy TAC applied at Rigshospitalet from 1999 to July 2007 with follow-up until January 2008.

The procedure was performed under general anesthesia with a Pfannenstiel incision. The bladder peritoneum was incised and the bladder pushed caudally. The uterine vessels were identified and displaced laterally. At the level of the internal os a 5-mm Mersilene® suture (Ethicon, UK) was passed from posteriorly to anteriorly on both sides of the cervix using a blunt Dechamp suture guide to penetrate the parametrium. The band was adjusted to pass a Hegar 8 dilator between the band and the cervix, and sutured anteriorly with overlap using non-absorbable Ethibond 4-0 suture. The same

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maternal-fetal physician (JLR) applied the TAC. For any subsequent ongoing pregnancy, cesarean section was planned at 36–37 weeks gestation.

Forty-six women had a pre-pregnancy TAC applied during the observation period. One woman was excluded since she did not fulfill the criterion of at least one prior second trimester delivery, as she had a previous delivery at 33 weeks after cervical incompetence diagnosed at 27 weeks and was treated with bed rest. The 45 other women had all experienced one or more previous second trimester abortions or deliveries. Previous second trimester losses were grouped into categories of classical cervical incompetence, secondary cervical incompetence, preterm premature rupture of membranes (PPROM) and/or contractions or infection. Classical cervical incompetence was defined as second trimester loss/delivery after painless dilatation of the cervix. Secondary cervical incompetence was characterized by a previous traumatic delivery at term or severely damaged cervix after surgery followed by second trimester loss associated with cervical incompetence. Information on previous TVC, abortion, assisted reproduction treatment, fibromyoma, uterine malformation, and cervical conisation were retrieved from the medical records. Obstetric outcome after TAC was characterized by gestational age at delivery, first trimester abortions and on-going pregnancies. All medical records were scrutinized for possible complications at the application of TAC and at cesarean section.

The Stata 9.2 (StataCorp, Texas) program was used for statistical analysis.

Results

Twenty-six women (58%) had experienced one and 19 (42%) two or more previous second trimester deliveries. Classical cervical incompetence was observed in 27 (60%) women. Prior to the TAC, 19 women (42%) had a history of elective or emergency TVC. The mean maternal age at time of procedure was 32.2 years. The mean time from suture insertion to conception was 4.4 months (range 1–14). Further details of the obstetrical history are described in Table I. Two women had minor complications during the application of TAC. One had a bleeding of 800 ml (median blood loss for all women 100 ml), the other paresthesia in the abdominal scar and left femoral region, which resolved within a year.

Within the observation period, 36 women had a total of 50 pregnancies. Nine women did not become pregnant. Seven pregnancies resulted in first trimester loss: four missed abortions, one spontaneous abortion, one ectopic pregnancy and one induced abortion. The missed abortions were treated with

Table I. Obstetric history before pre-pregnancy transabdominal cerclage.

	Women <i>n</i> = 45	Rate %	Events <i>n</i>
Classical cervical incompetence	27	60	48
Secondary cervical incompetence	5	11	5
PPROM	6	13	9
Contractions and/or infection	7	16	12
Second trimester loss/delivery	45	100	67
Third trimester delivery	14	31	17
TVC	19	42	26
Elective TVC	8	18	10
Emergency TVC	14	31	16
Cervical conisation	8	18	
Infertility treatment	11	24	
First trim. induced abortion	14	31	12
First trim. spontaneous abortion	20*	44	30
Uterine malformation	4	9	
Fibromyoma	7	16	

*Three ectopic pregnancies.

PPROM: preterm premature rupture of membranes.

TVC: transvaginal cerclage.

vacuum aspiration after dilatation to Hegar 8. The woman with an ectopic pregnancy had laparoscopic tubotomy followed by methotrexate treatment, followed a few years later by an intrauterine term pregnancy with the suture in situ. One fetus had a diagnosis of Down's syndrome at just under 14 weeks. A laparotomy to remove the TAC was followed by a vacuum aspiration, and a new TAC was applied. All procedures were performed under general anaesthesia.

Six pregnancies had due dates after the end of the observation period leaving 37 pregnancies for analysis of pregnancy outcome.

No patient had a second trimester loss. One woman had vaginal bleeding with contractions at 30+4 weeks and a cesarean section was done at this time because of fear of perforation of the cervix. No signs of perforation were found. All other pregnancies (97%), including a twin pregnancy, lasted for more than 34 weeks. Mean gestational age at delivery was 36+5 (± 3 days SD) weeks. Mean birthweight was 2,914 g (± 392 SD). The maximum observed number of successful pregnancies following the procedure was three. The survival rate after viability (24 weeks) was 100%.

One woman had a cesarean section complication, which might be attributed to the TAC. In this case, insufficient drainage after the cesarean section led to retention of blood and subsequent uterine atony

with uterine muscle hematoma and continuing bleeding. Since this 40-year-old previous infertility patient did not want future pregnancies the surgeon decided on hysterectomy.

Discussion

The benefit of TAC and TVC has not been compared in randomized controlled trials (9–12). A comparison between TAC and TVC in a retrospective cohort study of 64 pregnancies showed that TAC was associated with a reduction in preterm delivery and PPROM (13).

From a systematic review of 14 studies and case stories including a total of 157 women the authors conclude that TAC applied in early pregnancy might be associated with decreased risk of perinatal death or delivery before 24 weeks, but an increased risk of serious complications like bleeding, bladder and uterine artery injury, and complications of anesthesia (8). Since the publication of the review, three large case series ($n = 75$, $n = 101$, $n = 88$) have shown high success rates and few major complications after application of TAC in early pregnancy (3–5).

In 2004, Groom et al. (6) reported the largest series of 19 pre-pregnancy TAC with a 100% survival rate and 89% women delivered after 36 weeks. No significant intraoperative, antenatal, intrapartum, and neonatal complications were found.

The laparoscopic placement of TAC before pregnancy, which is probably associated with less intraperitoneal adhesions than by laparotomy, was performed in 11 women with good results by Mingione et al. (7). The laparoscopic application of TAC, however, does not preclude that a laparotomy (cesarean section) is needed at subsequent deliveries.

By TAC during pregnancy there may be a higher risk of preoperative complications such as bleeding and rupture of membranes. However, the application of TAC before pregnancy has other potentially adverse effects. In case of second trimester fetal death, a laparotomy to remove the TAC before removal of the fetus is needed. Also, women failing to conceive following TAC have undergone an unnecessary surgical procedure.

Some authors have been concerned about future fertility problems (6,14). We found that nine women did not conceive after TAC. The reasons were short observation period, failed fertility treatment, advanced maternal age, changed life-situation, and deliberate postponement of pregnancy.

Until recently, TAC was only applied after a history of classical cervical incompetence, traumatized cervix and a previously failed TVC. We gradually broadened the indications for TAC to women with a previous

second trimester loss without traditional signs of cervical incompetence such as women with PPROM, infection and secondary cervical incompetence. The background for this change of indication was that the above-mentioned conditions might be related to a dynamic cervix with funneling and descending membranes facilitating ascending vaginal microflora.

Almost a quarter of women who have had a previous early spontaneous preterm birth (at 23–27 weeks of gestation) will deliver at less than 28 weeks of gestation in a subsequent pregnancy (15). Women with a prior cervical trauma also have an increased risk for preterm delivery or abortion (15). Although the result of application of TAC was successful; this does not show that the procedure was necessary in the individual case. At present, however, more women are older when attempting pregnancy and infertility treatment is common at a more advanced reproductive age. After a loss these patients are interested in a treatment that may improve their chances of a successful pregnancy. Also, they do not consider a cesarean delivery a major disadvantage.

TVC is a procedure with few complications but not as effective as TAC (8). Pre-pregnancy TAC is a safe procedure with an excellent fetal outcome. We suggest that TAC might be offered to all women with classical cervical incompetence and to women with one or two second trimester losses where cervical incompetence cannot be ruled out.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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