

Transabdominal Cervical Cerclage: Laparoscopy or Laparotomy

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ABSTRACT

Cervical incompetence is one of the common causes of recurrent pregnancy loss. Transabdominal cervical cerclage is the option where previous vaginal cerclages have failed or in patients with congenital short or absent cervix, a lacerated cervix, severe scarring of the cervix, and multiple deep cervical defects. So this review is aimed to study the effectiveness of laparoscopic cerclage in comparison with cervical cerclage by laparotomy. A literature search was performed using Springer link, BMJ, Journals of Minimal Access Surgery, and major general search engines like Google, MSN, HighWire Press, and Yahoo. The studies between 2000 and 2015 were selected and were reviewed for the prolongation of pregnancy, intraoperative and postoperative complications, operating time, blood loss, postoperative recovery in both the laparoscopic and open procedure. The review concludes that if transabdominal cervical cerclage is preferred then laparoscopic approach is superior to laparotomy as it is as effective as open method with fast postoperative recovery.

Keywords: Abdominal cerclage, Cervical cerclage, Cervical incompetence, Cervical stitch, Laparoscopic cerclage, Laparotomy, Recurrent pregnancy loss.

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INTRODUCTION

The American College of Obstetricians and Gynecologists (ACOG) defines cervical incompetence as the inability of the uterine cervix to retain a pregnancy in the second trimester, in the absence of uterine contractions.¹ Cervical incompetence is customarily treated by transvaginal cervical cerclage, which is normally done under general or regional anesthesia. There are two primary strategies: The Shirodkar method includes putting the stitch high up around the cervix, as close as would be prudent to

the level of the inner cervical os, while the McDonald "purse string" procedure includes embedding the line around the intravaginal segment of the cervix.² The procedure is normally performed toward the end of the first trimester or the start of the second trimester, and the stitch is generally removed at term. In the event that a past transvaginal cervical cerclage has fizzled or it is not actually conceivable (for instance, if the cervix is short), a transabdominal method might be utilized. This ordinarily includes a laparotomy to put the stitch around the cervix and cesarean section is performed to deliver the baby.^{1,2}

With the increase of laparoscopic potential outcomes, laparoscopic transabdominal cerclage (TAC) turned into a choice. This strategy is ideally performed in the nonpregnant state and has the upside of shorter hospitalization and speed recovery with less postoperative morbidity.^{3,4} So this review is aimed to study the effectiveness of laparoscopic cerclage in comparison with cervical cerclage by laparotomy.

AIM

The aim of this study was to compare the effectiveness and safety of laparoscopic cervical cerclage *vs* TAC by laparotomy.

MATERIALS AND METHODS

A literature search was performed using Springer link, BMJ, Journals of Minimal Access Surgery, and major general search engines like Google, MSN, HighWire Press, Yahoo, etc. The following search terms were used: Laparoscopic cerclage, recurrent pregnancy loss, abdominal cerclage, cervical incompetence, laparoscopy, laparotomy, and cervical stitch. The studies between 2000 and 2015 were selected and those studies which compared the outcomes after third trimester were selected for review. Prolongations of pregnancy, intraoperative and postoperative complications, operating time, blood loss, postoperative recovery were the parameters evaluated for the effectiveness and safety of the laparoscopic and open procedure.

RESULTS

The available literature consists of cohort studies, small case series, and also some case reports. Fifteen articles

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Table 1: List of studies comparing the route advocated, time of placement, and outcome

Selected studies	Sample size	Route advocated	Time of placement	Outcome
Ades et al ¹	69	51 Laparoscopy 18 Laparotomy	Nonpregnant and during pregnancy	98% viable pregnancy in laparoscopy 100% viable pregnancy in laparotomy
Ades et al ⁷	64	Laparoscopy	Nonpregnant and during pregnancy	95.8% viable pregnancy
Umstad et al ⁸	22	Laparotomy	Nonpregnant and during pregnancy	91% deliveries > 34 weeks
Thuezen et al ⁹	45	Laparotomy	Nonpregnant	97% deliveries > 34 weeks
Davis et al ¹⁰	40	Laparotomy	During pregnancy	90% deliveries > 33 weeks
Whittle et al ⁶	65	Laparoscopy	Nonpregnant and during pregnancy	89% deliveries on 35.8 ± 2.9 weeks
Carter et al ⁵	19	12 Laparoscopy 7 Laparotomy	Nonpregnant and during pregnancy	75% viable pregnancy in laparoscopy 71% viable pregnancy in laparotomy
Nicolet et al ¹¹	5	Laparoscopy	Nonpregnant	100% term deliveries
Reid et al ¹²	2	Laparoscopy	Nonpregnant	100% deliveries > 34 weeks
Liddell et al ¹³	10	Laparoscopy	Nonpregnant	100% deliveries in third trimester
Kjøllestadal et al ¹⁴	1	Laparoscopy	Nonpregnant	100% term delivery
Al-Fadhli, Tulandi ¹⁵	2	Laparoscopy	Nonpregnant	100% deliveries > 34 weeks
Mingione et al ⁴	11	Laparoscopy	Nonpregnant	100% deliveries > 34 weeks
Gallot et al ¹⁶	2	Laparoscopy	Nonpregnant	100% term deliveries
Cho et al ¹⁷	20	Laparoscopy	During pregnancy	95% live born infants

were selected for review and the included studies are tabulated in Table 1.⁵⁻¹⁷ From these 15 articles, 132 patients underwent laparotomy and 245 patients underwent laparoscopy for transabdominal cervical cerclage. The procedure was performed in both the pregnant as well as in the nonpregnant state.

Carter et al⁵ compared a prospective cohort of patients undergoing laparoscopic cerclage with a historical control group of patients who underwent a laparotomy for TAC and there was no difference in outcome for viable pregnancies (75% in laparoscopy and 71% in the laparotomy group). A similar study outline is seen in a study of Whittle et al⁶ with a larger sample size. Sixty-five patients underwent a laparoscopic TAC either before or during pregnancy. The outcomes were compared with the traditional laparotomy approach using previously reported cohorts. The success rate in this study was 89% with a mean gestational age of 35.8 ± 2.9 weeks, which is a comparable obstetric outcome with the laparotomy approach.

Also from the selected studies the success rate of live pregnancies after 33 weeks ranges from 71 to 100% in the laparotomy group and 75 to 100% in the laparoscopy group with a mean success rate of 89.8% in the laparotomy group and 96% in the laparoscopic procedures. It can be concluded from these studies that the laparoscopic approach for TAC is as effective as the laparotomy approach and can be safely performed during pregnancy also.

In one of the case series with 11 cases, a small bowel injury was reported⁴ and two uterine vessel injuries were reported in two studies.^{16,17} In a prospective cohort study by Ades et al,¹ four cases in the laparotomy group and one case in the laparoscopy arm had complications. In the laparotomy group, three cases had intraoperative hemorrhage and one wound infection and in the

laparoscopy group perforation of the bladder was noted in one patient. The laparoscopic TAC confers a similar rate of perioperative complications as the laparotomy and is best finished in nonpregnant or in the first trimester.

The operating time in the laparoscopic group was more compared to the laparotomy but did not have any statistical significance and in some studies the laparoscopic cerclage was concomitantly performed¹ with other surgeries. The laparoscopy group had significantly lower surgical morbidity, which was contributed mainly by a reduced hospital stay. Most laparoscopy cases were classified as outpatient procedures and were performed with oral analgesia only, with the patient leaving the hospital on the same day. The difference in blood loss was also not clinically significant and no patient required transfusion.

DISCUSSION

Aside from the more complexity in the procedure of a TAC, there are some points of interest when utilizing this method rather than the transvaginal cerclage, i.e., high situation of the suture, no slippage of the cerclage, absence of the suture material inside the vagina that could bring about infection and preterm labor, and the advantage to leave the tape *in situ* between pregnancies.³ To utilize this method laparoscopically, the surgeon needs ability in laparoscopic suturing. In contrast with laparotomy, laparoscopy outcomes are less or no hospitalization, less postoperative torment, and quicker recovery.^{18,19}

Laparoscopic cervical cerclage can be performed during pregnancy or as an interval procedure in nonpregnant women. It is performed under general anesthesia. In a nonpregnant woman, a dilator may be initially inserted into the cervix through the vagina for uterine

manipulation. The peritoneal cavity is first insufflated with carbon dioxide through a Veress needle inserted into the umbilicus. Optical and secondary ports are created to provide access for the laparoscope and surgical instruments. The bladder is dissected away from the uterus and a ligature of tape or mesh is secured around the cervical isthmus, above the cardinal and uterosacral ligaments. As with the open transabdominal approach, cesarean section is necessary to deliver the baby.¹⁻³

The transabdominal cervical cerclage can be done as a prophylactic procedure or as an indicated one. The specific indications include those people in whom an agreeable transvaginal cerclage is not actually feasible with a congenital short or absent cervix, a lacerated cervix, severe scarring of the cervix, and multiple deep cervical defects.¹⁵ Likewise, a past fizzled vaginal cerclage has been regarded as an indication for a TAC.^{9,20} Some studies researched the adequacy of a prophylactic cerclage after cervical conization for decreasing the danger of preterm delivery. Regardless of the rise in the rate of preterm delivery after conization, no advantage on the utilization of prophylactic cerclage can be found.³

There is a choice of performing this procedure in a pregnant or a nonpregnant state. In the pregnant state, the cerclage is performed toward the end of the first trimester.²¹ The benefit of placing the stitch in the nonpregnant state is the reduction in fetal and maternal risk, easy manipulation with good exposure of the uterus and with less chance of bleeding during the procedure. This procedure can be concomitantly performed with other surgeries like excision of endometriosis, dye studies, adhesiolysis, and myomectomy.¹

The most imperative complication of a TAC is increased bleeding.^{4,21} Doing this method in the nonpregnant state and utilizing more up to date techniques of laparoscopic TAC, this complication gets to be rarer; however, no information on the actual frequency are available. Mingione et al⁴ reported an initially unrecognized penetrating small bowel injury that occurred during lysis of extensive adhesions involving the bowel and uterus. Subsequently, the patient developed a pelvic abscess that was treated with computed tomography-guided drainage and intravenous antibiotics. The estimated blood loss in cases with intraoperative hemorrhage was 250 to 300 mL; but all of the patients were asymptomatic with regard to anemia, and also no blood transfusions were required and laparoscopic perforation of the bladder was repaired at the time of surgery.

Another complication is the morbidity of the unavoidable resulting cesarean section. There are likewise the intricacies of laparoscopy itself. A portion of the reported complications after transvaginal cerclage, like preterm premature rupture of membranes, chorioamnionitis, and cervical dystocia are not found in the laparoscopic

TAC. By and large, one can say that this minimal-invasive method has good success rate and minimal co-morbidities with less complication.

CONCLUSION

Transabdominal cervical cerclage could be either prophylactic or indicated, but has a higher success rate. Transabdominal cerclage cannot be compared with the transvaginal cerclage as the indications and situations of both the procedure differ and also the transabdominal procedure gives an additional advantage to perform concomitant surgery along with the cerclage. Laparoscopic approach for TAC is as effective as the laparotomy and can be safely performed during pregnancy also. Laparoscopic method is preferred over laparotomy as it is associated with less or no hospitalization, less postoperative pain, and quicker recovery so that the morbidity associated with laparotomy can be prevented.

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