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Successful treatment of cervical incompetence using a modified laparoscopic cervical cerclage technique: a cohort study

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ABSTRACT

Objective: We introduce a modified surgical method for laparoscopic cervical cerclage (LCC) and compare the operative data and obstetric outcomes to those obtained by traditional vaginal cerclage (TVC).

Study design: This is a prospective cohort study in a university-affiliated hospital from August 2008 through February 2013. Nineteen patients treated by LCC were prospectively monitored and the treatment outcomes were compared to a control group consisted of 25 patients that were retrospectively studied and treated with TVC using traditional McDonald suture. Laparoscopic cervical cerclage was performed with Mersilene tape and a modified surgical technique. Perioperative complications and obstetric outcomes were compared between LCC and TVC treatment groups.

Results: No perioperative complications occurred during LCC treatment. Of the 19 LCC patients, 15 (78.9%) became pregnant during the study period. The fetal salvage rate was 92.3% (12/13) and no adverse events were encountered. The mean gestational age in LCC group was 36.4 weeks, and it was 17.4 weeks longer than their previous pregnancy age, which was significantly higher than obtained by TVC.

Conclusion: This modified technique for laparoscopic cervical cerclage demonstrates good obstetric outcomes with low risk of adverse events, which may provide a reasonable alternative to achieve pregnancy success in patients with cervical incompetence.

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Introduction

Cervical incompetence is defined as the inability to retain an intrauterine pregnancy to full term due to structural or functional insufficiency of the cervix [1]. It occurs in 0.5%–1% of all pregnancies and has a recurrence risk of up to 30% [2]. The traditional vaginal approach of cervical cerclage during mid-term pregnancy [3] has been used for several decades and is effective for most patients. However, a small minority are not successfully treated by the transvaginal approach. For example, patients with anatomically deformed, deeply lacerated, or severely scarred cervixes from previous failed vaginal cerclage cannot be treated by placement of a transvaginal suture. In 1965, transabdominal cervical cerclage was first described [4], and subsequent studies reported successful results in patients for whom a vaginal approach was deemed impossible. In recent years, a laparoscopic cervical cerclage approach was described in several case series,

and results compared favorably to the traditional laparotomy approach [5].

The present study reports a series of cervical incompetence cases treated by laparoscopic cervical cerclage (LCC) using a modified surgical technique which is easy-operating, minimal invasive and highly effective. Operative details and obstetric outcomes were compared with those obtained using traditional vaginal cerclage (TVC).

Materials and methods

A prospective observational cohort study was conducted from August 2008 through February 2013 at the First Affiliated Hospital of Sun Yat-sen University (Guangzhou, China). The study was approved by the institutional ethics board and informed written consent was obtained from all patients. The indications for laparoscopic cerclage included a history of cervical incompetence/insufficiency, with or without congenital short cervix or traumatic/surgical damage rendering the vaginal approach difficult or previous failed transvaginal cerclage. Nineteen patients were selected for LCC and were prospectively monitored for perioperative and postoperative complications, conception success, and successful delivery. We performed a parallel

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Table 1
Patient demographics.

Demographic	LC group ^a (n = 19)	VC group ^b (n = 25)
Maternal age at cerclage (y, [median, range])	31 (27-35)	32 (28-41)
No. of prior T2 ^c loss (median, range)	2.5 (1-5)	2 (0-3)
No. of preterm labor < 34 w (median, range)	0	0.24 (0-2)
Patients with prior failed vaginal cerclage (%)	n = 11 (57.8%)	n = 3 (12%)
No. of prior failed vaginal cerclage (median, range)	1 (0-2)	0.08 (0-1)
Prior gestational age (for pregnancies continued beyond the first trimester [median, range])	21 (16-27)	23 (17-30)
Patients with cervical abnormality (laceration at delivery)	n = 4 (21.1%)	n = 0
Patients with prior cone biopsy (%)	n = 1 (5.3%)	n = 0

Note: There were no significant differences of demographics between the two groups.

^a LC group, laparoscopic group.

^b VC group, vaginal group.

^c T2, second trimester.

retrospective analysis of 25 patients treated by TVC during the same period. For TVC group, all patients were clinically diagnosed with incompetent cervix before pregnancy and were treated with prophylactic TVC using traditional McDonald suture in the second trimester of pregnancy. The demographic data of the two treatment groups is shown in Table 1.

Technique description

For LCC group, prophylactic laparoscopic cerclage was performed as an interval procedure before pregnancy. The cerclages were all placed in the same fashion by one surgeon.

Surgical preparation

Preoperative preparations were similar to those of other laparoscopic surgeries. The patient was prepared in the dorsal lithotomy position with a urinary catheter in situ. A transcervical uterine manipulator was used to facilitate uterine manipulation. A 3-port operative laparoscopy system was used. Initial abdominal entry is achieved through the closed Veress technique at the umbilicus. Abdominal insufflation was maintained at 12-15 mmHg using CO₂.

Step 1: development of the paravesical and vesicouterine spaces.

The vesicouterine peritoneum was incised using monopolar forceps and a combination of sharp and blunt dissection. The

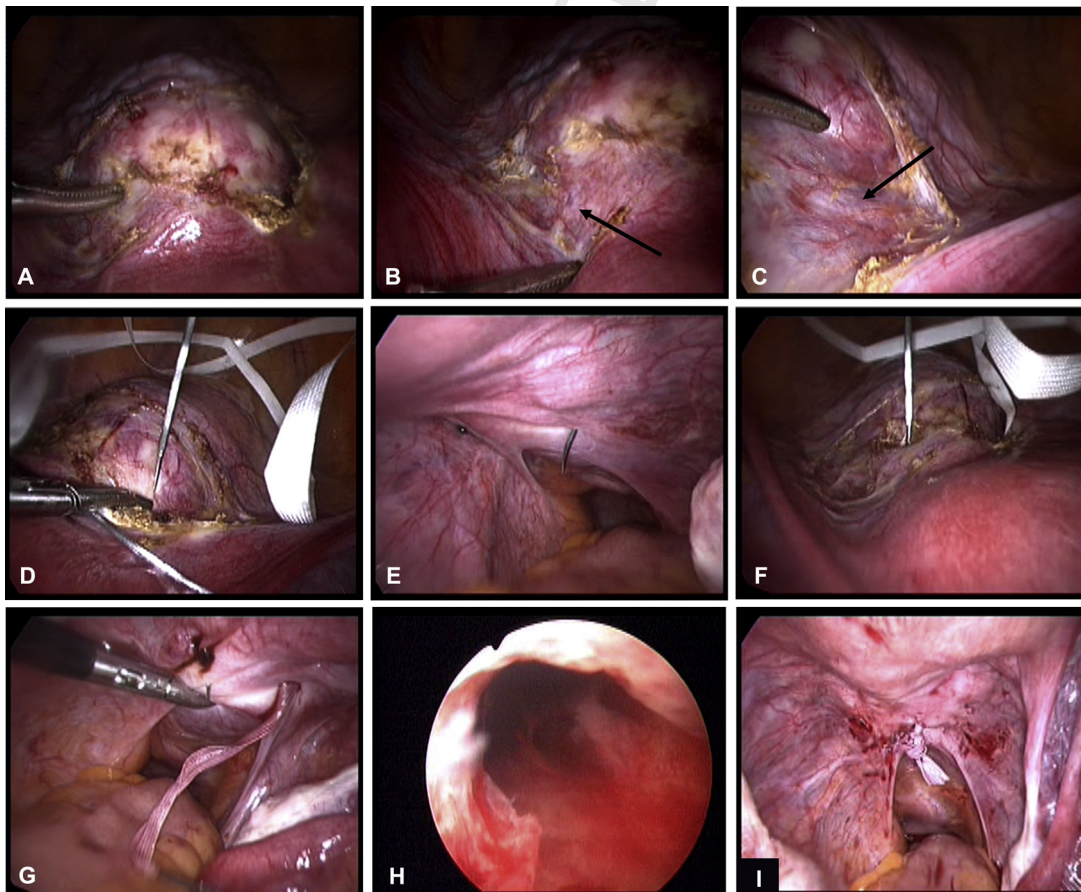


Fig. 1. Intraoperative photographs illustrating the modified laparoscopic cervical cerclage method. (A) Step 1: Create paravesical and vesicouterine spaces. (B and C) Step 2: Identify the contours of the uterine vessels on both sides of the uterine isthmus. (D-G) Step 3: Place the Mersilene tape around the cervicouterine junction using a direct suture technique. (H) Step 4: Ensure that the tape had not passed through the cervical canal by hysteroscopy. (I) Step 5: Tie the tape posteriorly with an intracorporeal knot.

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