

# Effectiveness of emergency cervical cerclage in patients with cervical dilation in the second trimester

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## Summary

**Objective:** Efficacy of emergency cerclage commenced in the second trimester is a controversial issue. In this study, we aimed to assess the success and associated complications of emergency cerclage in patients with cervical dilatation in the second trimester. **Material and Methods:** In this retrospective study, medical records of 75 pregnant women who had clinically and ultrasonographically confirmed cervical dilatation in the second trimester who had undergone cervical cerclage were analyzed. Pregnancy prolongation was the main outcome measure. **Results:** Seventy-five women were included to the study. Mean age was 27 and mean gravidity of the patients was three. Mean cervical length was 28.5 mm (12-41 mm). The rate of spontaneous abortion, immature deliveries, prematurity and deliveries after 34 weeks were 2.7% (n = 2), 8% (n = 6), 12 (n = 9) and 77.7 (n = 58), respectively. Fetal survival rate was 89.1% (n = 65). Serious vaginal bleeding from the suture area was noted in two patients (2.6%). No postoperative complications occurred. **Conclusion:** Emergency cerclage is a simple surgical procedure with lower complication rates and can effectively prolong gestation to viability. It can be considered as a useful measure for patients with evidence of cervical changes in the second trimester.

**Key words:** Cerclage; Pregnancy; Cervical incompetence.

## Introduction

In term pregnancies, labor begins after the 37<sup>th</sup> week of gestation with regular uterine contractions and dilation and effacement (shortening) of the cervix. However, when cervical changes begin during the second trimester (around 14-24 weeks), this is referred to as cervical insufficiency or cervical incompetence (CI). This is a very confusing diagnosis in obstetrics. The incidence is unknown, the diagnostic criteria are not well defined, the pathogenesis is poorly understood, and the treatment is also uncertain [1]. A number of surgical techniques were determined for the treatment of CI. Cervical cerclage is a prophylactic operative intervention that has been used in the management of second trimester loss since it was first described by Shirodkar and then McDonald in the 1950s, however the subject remains controversial [2, 3]. Several studies have failed to prove any benefit from cerclage placement in patients with incompetent cervixes [4-6].

In this retrospective study, the aim was to clarify pregnancy outcomes in patients with a diagnosis of cervical dilatation in the 2<sup>nd</sup> trimester and undergoing cervical cerclage in a tertiary perinatal center.

## Material and Methods

The study was conducted in the High Risk Pregnancy Unit of Dr. Zekai Tahir Burak Training and Research Hospital over a period of ten years from January 1, 1999 to December 31, 2008. In this period, a total of 192,530 pregnant patients were admitted to the hospital. Of these, 231 patients underwent the cervi-

cal cerclage procedure. Only emergency cerclage operations carried out for cervical dilatation were included in the study. The informed consents of the patients were obtained before the operations. All cerclage operations were performed under epidural anesthesia and the McDonald cerclage procedure was chosen for all patients. Antibiotics were given to prevent infection as there is increased risk of preterm premature rupture of membranes with cerclage [1-4]. Relevant information of the patients regarding important details of obstetric history, demographic information, examination, cervical length measured by transvaginal ultrasonography (TVS), investigation, surgical technique, duration of hospital stay and pregnancy outcome was recorded. The study protocol was approved by the local ethical committee of the institution and conducted in accordance with the basic principles of the Declaration of Helsinki.

## Results

Results are given in a tabulated form. The total number of patients attending during the study period was 192,530. CI was diagnosed in 1,539 patients. Frequency of CI was 7.9/1,000 (0.79%). McDonald's suture technique was applied to the 231 study patients. Among these 75 were performed on the patients with cervical changes. There were 13 multifetal pregnancies (17.4%) (twin pregnancy: 8, triplet pregnancy: 5). Among them, ten pregnancies were achieved by assisted reproductive techniques (13.3%).

## Discussion

The cervix is labelled incompetent when it is unable to retain an intrauterine gestation until term. It plays a fundamental role in supporting a pregnancy. The cervical cerclage operation was first proposed by Shirodkar and

Table 1. — *Preoperative and postoperative information of the patients.*

Variable	Minimum	Maximum	Mean
Age	18	41	27.7
Parity	0	3	0.79
Previous abortion	0	5	1.32
Gestational week at surgery	18	26	20.2
Cervical length (mm)	12	41	28.5
Cervical dilation (mm)	5,00	32.00	14.1
Hospital stay (days)	1	11	2.2
Gestational week at delivery	18	41	35.33
Birth weight (grams)	170	4,000	2,667

Table 2. — *Previous operations of the patients.*

Operation	N	%
Cesarean	8	10.7
Endometriom	2	2.7
Curettage	9	12.0
Metroplasty	1	1.3
Myomectomy	2	2.7
Polipectomy	1	1.3
Septum resection	3	4
Cerclage	3	4.0
No operation	46	61.3
Total	75	100.0

McDonald to prevent preterm deliveries in the midst of the 1950s [2, 3]. Despite being used in the management of suspected cervical insufficiency for nearly 50 years, there is still a debate on the use of cervical cerclage, a result of the inadequate evidence on the efficacy of the procedure. Conventionally the main indication to perform cervical cerclage has been based on past obstetric history of three or more previous preterm deliveries/second trimester losses defined as cervical incompetence.

Cervical TVS has been used as a screening test to identify the women who are at risk of preterm delivery, with an ultrasound-indicated cerclage inserted, based on the findings of a short cervix. A cervical length of less than or equal to 15 mm and the presence of cervical funnelling have been shown to increase the risk of preterm delivery [7, 8].

Emergency cerclage is defined as placement of cerclage sutures in patients with cervical changes that is confirmed either clinically or by TVS [4-6].

There is no truly diagnostic test for CI. Digital examination has low sensitivity. The role of TVS has been extensively studied in patients with a clinical diagnosis of CI [9, 10]. Opening of the cervical os at rest or in response to fundal pressure detected by TVS appears to be an early feature of cervical incompetence [10-12]. We used history, clinical examination and TVS of the cervix as diagnostic criteria.

Pregnancy outcome in women with a dilated cervix is usually grim. Management of advanced cervical dilatation can be bed rest or a cerclage operation. The evidence regarding whether emergency cervical cerclage reduces the risk of preterm delivery is conflicting. In their recent study including 225 women with cervical changes in the 2<sup>nd</sup> trimester, Pereira *et al.* reported that cervical cerclage

Table 3. — *Pregnancy outcome after cerclage operations.*

Outcome	Frequency	Percentage
Abortion	2	2.7
Delivery before the 28 <sup>th</sup> week	6	8.0
Delivery between 28 and 34 weeks	9	12.0
Delivery after the 34 <sup>th</sup> week	58	77.3
Total	75	100

Table 4. — *Mode of delivery in patients with cervical cerclage.*

Delivery type	Frequency	Percent
Spontaneous vaginal delivery	48	65.3
Cesarean section	25	33.3
Total	73 (+2 abortion)	100.0

Table 5. — *Complications associated with cerclage.*

Timing	Complications	N	Percentage
During operation	Serious vaginal bleeding	2	2.6
During pregnancy	Preterm premature rupture of membranes	4	5.2
	Abruption	1	1.3
	Preeclampsia	5	6.8
	Eclampsia	1	1.3
During labor	Fetal distress	15	20.4
	Cervical trauma	4	5.2
	Dystocia	4	5.2

Table 6. — *Fetal death rate in patients who underwent cervical cerclage.*

Live birth (N)	Antepartum death (N)	Intrapartum death (N)	Neonatal death	Fetal survival rate (%)
69	3	0	3	92

can significantly prolong gestation and improve neonatal survival compared with expectant management [11]. Another non-randomized prospective study comparing emergency cerclage with bed rest found that those treated with cerclage had a significantly higher mean birth weight, however no difference was observed in perinatal mortality [12]. In our study 22.7% of patients (no: 17) were delivered before 34 weeks. Pregnancy prolongation until the 34<sup>th</sup> week of gestation could be achieved in 77.3% of patients after the procedure. It is generally accepted that cerclage placement for cervical incompetence is best performed prior to cervical dilatation and effacement. At least two studies have reported a lower success rate (50% and 59%) with emergency cerclage as compared with prophylactic cerclage (86% and 81%), although in neither study was the number of cases sufficient to reach statistical significance [13, 14].

It is commonly believed that emergency cerclage may be the only hope for prolonging gestation in parturients with advanced cervical changes in the second trimester with or without prolapsed membranes. However, emergency cerclage is a surgical procedure with well-defined operative risks. Whether such an approach is superior to bed rest and expectant management remains unclear (evidence-based medicine). The weight of evidence in the published literature suggests that emergency cerclage is

associated with a fetal survival rate of 22-100%. In our study fetal survival rate was 92%. However, such data comes exclusively from retrospective descriptive studies as ours. There are as yet no published randomized controlled trials (RCT) specifically addressing the issue of emergency cerclage.

A variety of etiological factors for CI have been proposed. Our study have revealed 34.7% of patients have a history of recurrent pregnancy losses (RPL). Cousin *et al.* showed that 30-50% of cases who underwent an emergency cerclage procedure had a history of RPL [15]. Cervical trauma sustained during forcible dilatation or cervical laceration during parturition can be the causes for CI. Our study showed 17.3% of patients had a history of previous D&C, metroplasty and septum resection. These cannot be stated as clear causative factors as we cannot assess the degree of damage to the cervix with these events. Uterine malformations appear to be higher in women with late miscarriages, and CI is frequently associated with uterine malformations [16]. These patients have a term pregnancy rate of only 50%. In our study there were 5.3% patients with uterine malformations.

In our study, cervical cerclage was performed at a mean gestational week of 15.14 weeks.

The McDonald suture was chosen for its simplicity and technical ease. Antibiotics were given to prevent infection as there is increased risk of preterm premature rupture of membranes with cerclage [1-4]. Bed rest, restriction of physical activity and sexual intercourse were advised as supportive measures.

In general, cervical cerclage is associated with increased obstetric interventions, including higher rates of admission to hospital, long-term tocolysis, induction of labor, and cesarean delivery [17, 18]. Puerperal infection occurs in approximately 6% of patients with cerclage, which is twice as common as the incidence in gestational age-matched controls without cerclage [17]. The MRC/RCOG trial has reported increased risk of membrane rupture, trauma to the cervix, difficulty of suture removal and choreoamnionitis after the procedure [18]. Our success rate was satisfactory with postoperative analgesics, antibiotics and bed rest.

There was serious vaginal bleeding in two patients as intraoperative complications. Both of the patients required blood transfusions and a vaginal pack was applied to the patients for two hours. Bleeding subsided within hours and both of the patients were able to carry their pregnancies for 34 weeks. None of the patients developed overt chorioamnionitis. The cause of preterm delivery in a few cases was placental abruption and severe preeclampsia.

In conclusion, although emergency cervical cerclage is an easily applicable procedure with lower complication rates, there are limited observational data supporting an emergency cerclage in a patient with a dilated cervix and no signs of labor. In the absence of incontrovertible evidence demonstrating a benefit, emergency cervical cerclage should be used judiciously and only after extensive and comprehensive patient counseling. The decision to carry out the procedure should be individualized.

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