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The Effectiveness of Rescue Cervical Cerclage: A Retrospective Observational Study

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ABSTRACT

We purposed to determine the outcome of emergency cervical cerclage (ECC) in pregnancies who had cervical dilatation in clinical examination.
We evaluated 20 women between 18-25 weeks and performed ECC with the McDonald technique. We collected data included: prolongation of pregnancy, gestational age at delivery, neonatal survival rate, and perioperative complications.
The mean gestational week of pregnancy was 21±1,6 at cerclage operation, and mean cervical dilatation was 2,5±1,1 mm. The mean prolongation of pregnancy and the mean gestational age at delivery were 47,3±37,1, and 27,8±5,3 were respectively. The mean birth weight was 1184±866 g. A perioperative complication occurred in 1 (5%) case. 15 of 20 (75%) neonates admitted to NICU and neonatal survival was 65%. Half of the cases delivered after 28 weeks of gestation, and there was no perinatal mortality in this group.
ECC is a beneficial procedure to prolong pregnancy and to improve perinatal outcomes.

Key Words: Cerclage, cervical insufficiency, perinatal mortality, preterm delivery

Introduction

Cervical insufficiency, formerly defined as cervical incompetence, is described as painless dilatation of the cervical os in the absence of uterine contractions in the second trimester of pregnancy (1). Although numerous risk factors, such as repeated cervical dilatation, loop electrosurgical excision, and conization, are associated with cervical insufficiency, the majority of cases have no particular risk factor (2). Fortunately, painless mid-trimester cervical dilatation is an uncommon complication that occurs in less than %1 of the general population (3). Emergency or rescue cervical cerclage (ECC) is fundamentally a salvage procedure to prolong pregnancy in women with advanced cervical dilatation or prolapsed membranes in the second trimester who carried out vaginal bleeding, discharge, or pelvic pressure sensation (4).

In this study, we aimed to evaluate the results of ECC in patients with a clinically relevant cervical dilatation.

Material and Methods

This study was conducted at Van Education and Research Hospital and Van Yüzüncü Yıl University Faculty of Medicine. Those two hospitals are the leading referral centers in the eastern region of Turkey. We performed a retrospective data analysis between January 2018 and March 2020. The inclusion criteria were singleton alive fetuses between 18th and 25th gestational weeks with cervical dilatation, which was diagnosed with the cervical examination. Firstly, we avoided digital examination and performed clinical examination with sterile valves. If we detect cervical dilatation in the sterile valve examination we measured cervical dilatation gently in sterile conditions. Patients with a tenderness of the cervix/uterus and temperature >38 Celcius were excluded due to the presence of clinical chorioamnionitis. Preterm premature rupture of membranes (PPROM), multiple gestations, a fetus with fetal anomalies, severe vaginal bleeding, or cervical dilatation more than 5 cm were also excluded. We waited 12-24 hours before performing ECC to detect patients with active preterm labor or active intraamniotic infections. Blood samples were obtained from all of the

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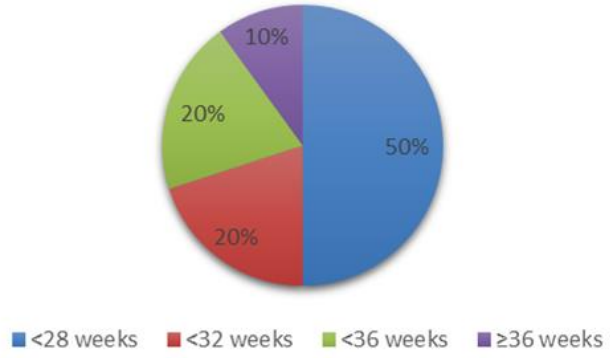

Fig. 1. Distribution of patients based on delivery weeks

patients, and C-reactive protein (CRP), white blood cell count (WBC) were measured. Before performing ECC, complications of procedure and probability of delivery of extremely preterm babies were described detailed to all of the patients. Written informed consent was obtained.

All women were administered intravenous and oral antibiotics before ECC (1 g ampicillin four times a day and 500 mg metronidazole intravenously twice a day and azithromycin 500 mg tablet once a day orally). We also administered 100 mg indomethacin suppositories twice a day and a single dose of 500 mg 17-OH progesterone corporate intramuscularly. We performed the McDonald technique and used Mersilen tape (Ethicon) in all of the patients. Under general or regional anesthesia, the patient is positioned to the Trendelenburg position. The vulva and vagina are cleaned with povidone-iodine, and a Foley catheter was inserted to the bladder, and the bladder was filled with 400 ml saline. Anterior and posterior lips of the cervix were grasped gently with sponge forceps. If there were bulging fetal membranes beyond the external cervical os, were reduced to the uterus using a Foley catheter balloon gently. McDonald's type ECC was inserted at the most proximal part of the cervicovaginal junction. We sutured 4-6 times around the cervix and knot the Mersilen tape at the bottom of the posterior fornix.

Postoperatively, the women were closely monitored for at least 24 hours in the hospital. 1 g ampicillin four times a day and 500 mg metronidazole intravenously twice a day were administered for seven days. Also, azithromycin 500 mg tablet once a day orally was used three days. Indomethacin 100 suppository was given once a day for three days. We discharged when we made sure patients were stable. We prescribed 200 mg micronize progesterone vaginally per day until labor. We monitored patients weekly in the first month of discharge and fortnightly until delivery. We performed fetal ultrasonography and assessed fetal growth and amniotic fluid. We performed urine culture every months and treated women who had urinary infections.

We delivered the patients in the presence of clinical chorioamnionitis or excessive vaginal bleeding. In terms of PPROM, we displaced ECC suture after 48 hours onset of PPROM to administer antenatal steroids and induced delivery.

The statistical analysis of patients was performed using statistical software (Statistical Package for the Social Sciences, SPSS version 24 Inc, IL, USA). The data are represented as medians (range) or frequencies (percentage).

Results

Our study included 20 women who underwent ECC. The mean age of patients was 26,3±5,4, and the mean BMI was 25,5±5.5. 9 of 20 (45%) cases were nulliparous, and the mean parity of patients was 0,75±0,85. Preterm birth history was detected in 2 of 20 (10%) cases. The mean gestational week of pregnancy was 21±1,6 at cerclage operation, and mean cervical dilatation was 2,5±1,1 mm. mean EFW was calculated as 362,1±113,8 g. The clinical and demographic characteristics of patients were demonstrated in Table 1.

The mean time from cerclage insertion to delivery and the mean gestational age at delivery were 47,3±37,1 days and 27,8±5,3 weeks were respectively. The mean birth weight was 1184±866 g. 55% of offspring were male, and the remaining 45% were female. We performed cesarean delivery in 13 (65%) cases, and 7 (35%) patients were delivered vaginally. A perioperative complication occurred in 1 (5%) case. PPROM occurred in this case and underwent TOP. 15 of 20 (75%) neonates admitted to NICU and neonatal survival was 65%. Perinatal outcomes of patients showed in Table 2.

According to gestational age at birth, 50% of cases delivered before 28 weeks of gestation. In these case the mean gestational age at ECC was 18.6±0.5 weeks and the mean cervical dilatation was 3.1±1.2 cm. Seven neonates died, and only 3 cases survived in this group. 10 (50%) patients delivered beyond 28 weeks. In this group the mean gestational age at ECC was 22.5±2.1weeks and the mean cervical dilatation was 2.1±1.2 cm. The mean gestational age at ECC was significantly lower and the mean cervical dilatation was significantly higher in patients who had delivered

Table 1. Clinical and demographic characteristics of 20 pregnant women (EFW: Estimated fetal weight, ECC: emergency cervical cerclage)

Variables	Mean±SD (range) or (%)
Age (years)	26,3±5,4 (20-40
BMI (kg/m2)	25,5±3,5
Parity	0,75±0,85 (0-3)
Preterm birth history	2 (10)
Gestational age at ECC	21±1,6 (18-24)
EFW	362,1±113,8 (230-580)
Cervical dilatation	2,5±1,1 (1-5)

Table 2. Perinatal outcomes of 20 patients (NICU: neonatal intensive care unit)

Variables	Mean±SD (range) or (%)
Time from cerclage insertion to delivery (day)	47,3±37,1 (0-126)
Gestational age at delivery	27,8±5,3 (19-38)
Birthweight	1184±866 (260-3100)
Route of delivery	Vaginal:7 (35)
	Cesarean:13 (65)
Postoperative complication	1 (5)
NICU admission	15 (75)
Neonatal survival	13 (65)

before 28 weeks of gestation. 4 of 20 (20%) women delivered between 28-32 weeks and all of the babies survived. Similarly, 4 (20%) neonates born between 32-36 weeks. Fortunately, 2 (10%) women delivered after 36 weeks of gestation. Distribution of women based on delivery weeks demonstrated in Figure 1.

Discussion

In the current study, we showed that ECC leads to a significant prolongation of pregnancy and increases the probability of perinatal survival. Also, the acute postoperative complication rate is low.

The exact etiology of cervical insufficiency is unknown, and multiple factors are more likely to play a role in pathogenesis. The leading causes are congenital malformations and cervical trauma history. However, in the majority of cases, there is no definitive reason and infections and inflammatory process consequence cervical dilatation (5).

There are no informative large sample sizes randomized control trials to identify factors associated with the outcome of ECC. Many retrospectives and small prospective studies showed promising results, with a trend toward improved perinatal outcomes.

Curti et al. evaluated retrospectively 52 women who had dilated cervix between 17 to 27 weeks. They performed ECC in 37 patients and managed expectantly remaining 15 cases. They showed that ECC significantly prolonged pregnancy (6). Aoki et al. compared outcomes of ECC versus expectant management in 35 women prospectively. They found that ECC prolonged pregnancy means 44 days, and delivery before 28 and 32 weeks of gestation was significantly lower in the ECC group. They concluded that ECC improves perinatal survival significantly, which had dilatated cervix (7). In recent years, numerous reviews and meta-analysis were published on this subject. Ehsanipoor et al. reviewed ten studies that include 757 women, 64% underwent ECC, and 36% were expectantly managed. They showed that ECC was associated with increased neonatal survival (71% vs. 43%) and prolongation of pregnancy (mean difference 34 days). They suggested that ECC is an effective procedure to increase perinatal survival compared to expectant management (8). Namouz et al. reviewed 34 studies, including 994 ECC. They found the mean prolongation of pregnancy as 61 days and mean gestational age at delivery as 30 weeks. The live birth rate was 84,8%, and neonatal survival was

80,6%. they suggested that ECC is associated with a longer latency period and better pregnancy outcomes compared to bed rest (9). We showed 47,3±37,1 days of prolongation of pregnancy and 65% neonatal survival in our study.

A major concern with ECC is that it may prolong pregnancy long enough only to result in extremely preterm birth. In this case, intact perinatal survival is low, and babies may suffer serious complications such as neurodevelopment delay or lung problems. Due to these possibilities, detailed and realistic counseling is mandatory, and it is important to respect the patient's preference. Therefore, to find reliable predictors of successful ECC is crucial. Grobman et al. sought to develop a predictive model for gestational age at delivery after placement of an ECC in the second trimester. They showed that delivery prior 24 weeks was associated with cervical dilatation more than 1,5 cm, ECC placement before 22 weeks of gestation, and fetal membranes prolapsing beyond external cervical os. For delivery occurring between 24 and 28 weeks, only a nulliparous pregnancy history emerged as a statistically reliable discriminator. Statistically significant predictors for birth occurring at greater than 28 weeks were cervical dilation no more than 1.5 cm, multiparity, and no membranes prolapsing beyond the external cervical os (10). Fuchs et al. analyzed the outcome of ECC in 85 women and found that obstetric history, bulging of membranes into the vagina, cervical dilatation greater than 3 cm and, presence of intrauterine infection increase substantially the risk of delivery before 32 weeks (11).

Several authors reported an association between subclinical histologic chorioamnionitis and shortened ECC-delivery interval. However, routine amniocentesis to exclude intraamniotic infection is controversial. Aguin et al. analyzed amniotic fluid specimens in 82 patients before ECC. They revealed that elevated IL-6, elevated WBC, and low glucose levels in amniotic fluid, in the absence of a positive amniotic fluid culture, are significantly associated with severe, extreme preterm delivery and neonatal death (12). Airoldi et al. evaluated 128 women who had dilated cervix between 15-25 weeks. They performed amniocentesis 20% 0f cases and showed that amniocentesis prior to ECC did not independently contribute to preterm delivery less than 28 weeks (13). Due to the lack of clear evidence, we did not perform amniocentesis before ECC.

Compared to elective prophylactic or ultrasonography-indicated cerclage, ECC has much more perioperative complications. (15). Rupture of membranes intraoperatively or in the immediate postoperative period is a significant concern of physical examination-indicated cerclage, especially with advanced cervical dilation and prolapsed fetal membranes. It has been reported in up to 65 percent of these procedures (14,15). Fortunately, in one case occurred this complication in the perioperative period.

In women with PPROM between 24-34 weeks of gestation, removal of cerclage suture is debatable. One concern is that removal of the cerclage will lead to earlier delivery; however, retention of the foreign body may increase the risk of infectious morbidity. Galyean et al. removed cerclage suture immediately and delayed suture removal in 24 cases randomly. They found that there was no statistical difference between two groups in composite neonatal outcomes fetal/neonatal death; or gestational age at delivery (16). We removed cerclage suture after administration of antenatal steroids due to an increased risk of infections.

The small sample size and retrospective design were the major limitations of our current study. The strength side was the inclusion of only singleton pregnancies, and to use strict inclusion and exclusion criteria.

ECC may prolong pregnancy in patients who had cervical dilatation in clinical examination. It has a low perioperative complication rate. Moreover, detailed counseling of patients before performing ECC is essential due to the possibility of survival of the extreme preterm baby.

References

1. Rand L, Norwitz ER. Current controversies in cervical cerclage. Semin Perinatol 2003; 27: 73-85.
2. ACOG Practice Bulletin no.142: Cerclage for the management of cervical insufficiency. Am J Obstet Gynecol 2014; 123: 372-379.
3. Berghella V. Every 30 seconds, a baby dies of preterm birth. What are you doing about it? Am J Obstet Gynecol 2010; 203: 416-417.
4. Liddiard A, Bhattacharya S, Crichton I. Elective and emergency cervical cerclage and immediate pregnancy outcomes: a retrospective observational study. JRSM Short Rep 2011; 2: 91.
5. Harger JH. Cerclage and cervical insufficiency: an evidence-based analysis. Obstet Gynecol 2002; 100: 1313-1327.
6. Curti A, Simonazzi G, Farina A, Memeci H, Facchinetti F, Rizzo N. Exam-indicated cerclage in patients with fetal membranes at

or beyond external os: a retrospective evaluation. J Obstet Gynacol Res 2012; 38: 1352-1357.
7. Aoki S, Ohnuma E, Kurasawa K, Okuda M, Takahashi T. and Hirahara F. Cerclage versus expectant management. J Obstet Gynaecol Res 2014; 40: 381-386.
8. Ehsanipoor RM, Seligman NS, Saccone G, et al. Physical Examination-Indicated Cerclage: A Systematic Review and Meta-analysis. Obstet Gynecol 2015; 126: 125-135.
9. Namouz S, Porat S, Okun N, Windrim R, Farine D. Emergency cerclage: literature review. Obstet Gynecol Surv 2013; 68: 379-388.
10. Grobman WA, Terkildsen MF, Soltysik RC, Yarnold PR. Predicting outcome after emergent cerclage using classification tree analysis. Am J Perinatol 2008; 25: 443-448.
11. Fuchs F, Bouyer J, Fernandez H, Gervaise A, Frydman R, Senat MV. Ultrasound cervical length measurement for prediction of delivery before 32 weeks in women with emergency cerclage for cervical insufficiency. Int J Gynaecol Obstet 2010; 110: 245-248.
12. Aguin E, Aguin T, Cordoba M, et al. Amniotic fluid inflammation with negative culture and outcome after cervical cerclage. J Matern Fetal Neonatal Med 2012; 25: 1990-1994.
13. Airoldi J, Pereira L, Cotter A, et al. Amniocentesis prior to physical exam-indicated cerclage in women with midtrimester cervical dilation: results from the expectant management compared to Physical Exam-indicated Cerclage international cohort study. Am J Perinatol 2009; 26: 63-68.
14. Aarts JM, Brons JT, Bruinse HW. Emergency cerclage: a review. Obstet Gynecol Surv 1995; 50: 459.
15. Simcox R, Shennan A. Cervical cerclage in the prevention of preterm birth. Best Pract Res Clin Obstet Gynaecol 2007; 21: 831.
16. Galyean A, Garite TJ, Maurel K, et al. Removal versus retention of cerclage in preterm premature rupture of membranes: a randomized controlled trial. Am J Obstet Gynecol 2014; 211: 1-399.e3997.