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Original Article

Does emergency cerclage really works in patients with advanced cervical dilatation?

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ABSTRACT

Objective: To asses the efectivity of emergency cerclage in the patients with advance cervical dilatation and prolapsed membranes.
Material methods: The patients who have ≥4 cm cervical dilatation with protruding membranes were included in the study. The patients were divided into two groups. Group I was consisted of the patients who had emergency cerclage procedure and group II was consisted of the patients who denied the operation and expectantly managed. The physical examination, pregnancy outcomes and the complications were compared between the groups. The results of the patients with emergency cerclage were analysed.
Results: 21 patients were referred with a ≥4 cm cervical dilatation with protruding membranes 33.3% of women with emergency cerclage were delivered within one week from the admission. One patient, who was a grand multiparous (G6P4A1), was delivered a healthy infant at 40 weeks of gestation. The remaining five patients were delivered between 21 and 24 weeks, but all the infants were died due to extreme prematurity.Two patients (22.2%) developed chorioamnionitis that necessitated long hospitalization (14–21 days). In group II (expectant management) 83,3% of the patients were delivered within the 48 h from the admission. There were no case of chorioamnionitis in group II.
Conclusion: Emergency cervical cerclage is not a rationale option for the patients with an advanced cervical dilation (>4 cm) together with protruding membranes in early second trimester because of the short prolongation time and high complication rate.

Introduction

Preterm birth and its results are the major health problem worldwide from an obstetric point of view [1]. Many strategies like tocolytics, antibiotics and cervical cerclage have been used to prevent preterm birth; but none have been proven to prevent it; instead the rate has steadily increased during the past 25 years [2,3]. Emergency cerclage is a procedure which is performed for cervical dilatation regardless of cervical incompetence and obstetric history. It was concluded that physical examination indicated emergency cervical cerclage appears to prolong gestation and to improve neonatal survival as compared with expectant management [4,5]. Studies in the literature about emergency cerclage usually involve a heterogeneous pattern, such as women with a short cervix, or with 1 cm or 5 cm dilated cervix have been included for emergency cerclage [6]. In a large retrospective study, patients with a cervical dilatation <3 cm and ones above 3 cm were compared. The suture-to-delivery interval was longer and neonatal outcomes were better in women with a cervical dilatation <3 cm [7]. In our study, our aim was to evaluate the efficacy of cervical cerclage in patients with more advanced cervical dilatation, namely those having a dilated cervix ≥4 cm with protruding membranes.

Materials and methods

Data were collected from our cohort of women with singleton pregnancies admitted to the Perinatology clinic of Trakya University, Faculty of Medicine, due to cervical dilatation at mid-trimester between January 2012 and March 2018. Ethical approval was obtained from the Ethical Committee of Trakya University. The patients who have ≥4 cm cervical dilatation with protruding membranes were included in the study. Women

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admitted with a cervix <4 cm or those without protruding membranes, who had rupture of membranes before or during the procedure, with signs of chorioamnionitis (fever, malodorous vaginal discharge), with regular uterine contractions, with chronic diseases (cardiac pathology, hypertension, diabetes) were excluded from the study. Also, fetuses with growth retardation, structural or chromosomal anomalies were not included in the study. Painless few uterine contractions or slight pelvic pain were not accepted as exclusion criteria.

Clinical symptoms, vaginal examination, the status of cervical dilatation, protrusion of the membranes and sonographic findings were recorded. Vaginal bacteriological analysis was not performed but abnormal (smell, amount, color) vaginal discharge were noted and malodorous vaginal discharge was accepted as an exclusion criteria. Demographic, as well as gynecological and obstetrical data were all collected. Leucocyte count and C-reactive protein (CRP) levels at admission were noted. A CRP level >5 mg/dl was accepted as "elevated CRP". Subjects were divided according to management strategy. Clinical management was decided case by case after an informed discussion about the risks and complications of cervical cerclage. The patients who have decided to have the procedure were accepted as the cerclage group. The patients who denied the operation were taken as the controls. Women in the control group did not receive any medical therapy, such as tocolytics, and were observed for natural course. Prophylactic antibiotics, intravenous amoxicillin and clavulanic acid, were introduced for 48 h.

Cervical cerclage was placed under general anesthesia using the McDonald technique in patients who have decided to have the operation on the same day. Following bladder drainage and cleansing with povidone-iodine solution, patients were positioned as reverse Trendelenburg position. The membranes were gently pushed beyond the internal os with a gauze using a pean forceps, and the anterior and posterior cervical lips were grasped and a number 2 nonabsorbable silk suture was inserted at 4 points (upper and lower right and upper and lower left). After cerclage placement, intravenous amoxicillin and clavulanic acid and for tocolysis rectal indomethacin was introduced for 48 h. After the first 48 h tocolytics and antibiotics were continued in clinical necessity. Continued uterine contractions and leukocytosis with or without high CRP levels were the indications for the prolonging tocolytic and antibiotic treatment. Whereas, fewer (>38 °C), maternal tachycardia, uterine tenderness with malodorous vaginal discharge were accepted as clinical diagnostic criteria for chorioamnionitis. We did not accept leukocytosis solely as diagnostic criteria for chorioamnionitis [8].

Demographic data, vaginal examination, cervical dilatation and laboratory parameters were recorded. Complications of the procedure, clinical follow-up, and pregnancy outcomes, time interval between admission to delivery and additional events were analyzed and compared between the groups.

Statistical analyses were performed using the Number Cruncher Statistical System (NCSS 2007) (Kaysville, Utah, USA). Data were analyzed using descriptive statistical procedures (mean, median, frequency, standard deviation, minimum, and maximum). Student's *t*-test was done to compare normally distributed variables, while Mann–Whitney U test was used to compare variables, which were not normally distributed. Fisher's exact-test and Yates' continuity correction test were preferred to compare the data. $p < 0.05$ was considered to be statistically significant.

Results

During the study period 21 patients fulfilled the inclusion criteria. Nine women accepted emergency cervical cerclage, whereas 12 patients denied the operation and managed expectantly with antibiotic treatment. The mean (min.-max.) maternal age of the whole group was 28.52 (19–40) years. Demographic characteristics of the patients in the cerclage and the expectant management groups were similar, but gestational age at admission were significantly higher in the cerclage group (Table 1).

Only one woman in the cerclage group had a history of pregnancy loss at 20 weeks. All patients had a cervical dilatation at least ≥4 cm. Respective mean (min.-max.) cervical dilatation in the expectant management and the cerclage groups were 5.58 [4–10] and 4.88 [4–7] cm. Mean (min.-max.) gestational age at admission was 21.6 (20–24) weeks in the expectant management group. Ten (83.3%) out of 12 women in the control group were delivered within 48 h from admission. In the controls, only one patient had gained one week and one other had gained two weeks without intervention. Mean gestational age at delivery was 21.9 (20–25) weeks, and both babies died in the neonatal period due to extreme prematurity. Chorioamnionitis was not detected clinically or due to laboratory results and long hospitalization was not required in the expectant management group.

Mean gestational age at admission was 18.77 (17–20) weeks in the cerclage group. Three (33.3%) out of 9 women were delivered within one week from the admission. One patient, who was a grand multiparous (G6P4A1), was delivered a healthy infant at 40 weeks of gestation (Patient 8- Table 2). The remaining five patients were delivered between 21 and 24 weeks. In these patients, mean interval between cerclage and delivery was 3.3 weeks but all the infants were died due to extreme prematurity. In terms of maternal complications, two patients (22.2%) developed chorioamnionitis that necessitated long hospitalization (14–21 days) (Table 2). Other complications like significant bleeding (>100 mL) after the procedure, complications due to anesthesia or tocolysis were not analyzed in the whole cohort.

Discussion

The management of a pregnant woman patient who was admitted with painless cervical dilatation is a clinical dilemma. Management options are expectant management, cervical cerclage, and pregnancy termination by induction of labor. Patients are usually in positive expectation about cervical cerclage and this makes the clinician's practice even more difficult.

Very few randomized controlled trials with adequate sample size have been conducted for the evaluation of the effectiveness of emergency cerclage [9]. The studies which conclude that emergency cerclage procedures prolong gestation and improve

Table 1
Patients characteristics of the groups.

	Cervical Cerclage (n = 9)	Expectant Management (n = 12)	*p*
Age [years, mean (min.-max.)]	30.4 (24-37)	29.5(19-40)	0,166
Multiparty	2 (22%)	2(18%)	0,586
Previous miscarriages (n, %)	3 (33.3%)	4 (36.3%)	0,681
Previous second trimester loss (n, %)	1 (11.1%)	0	0,571
Cervical dilatation [cm., mean (min.-max.)]	4.88 (4-7)	5.58 (4-10)	0,244
Gestational age at admission[weeks, mean (min.-max.)]	21.6 (20-24)	18.77 (17-20)	0,01

Table 2
Results of cervical cerclage.

Patient no	Cervical changes	Gestational weeks at cerclage	Gestational weeks at delivery	C-reactive protein (at admission)	WBC (at admission)	Outcome
1	7 cm dilated, prolapsed membranes	19	21	4.09	30600	Chorioamnionitis, 2 units of blood transfusion/330 gr
2	5 cm dilated, prolapsed membranes	20	21	5.7	23900	Chorioamnionitis/ 350 gr
3	5 cm dilated, prolapsed membranes	19	24	2.0	12300	Neonatal excitus/ 540 gr
4	4 cm dilated, prolapsed membranes	18	22	5.31	15000	Abortion/ 380 gr
5	5 cm dilated, prolapsed membranes	18	22	3.5	26600	Abortion/ 420 gr
6	6 cm dilated, prolapsed membranes	20	21	2.34	26500	Abortion/ 350 gr
7	4 cm dilated, prolapsed membranes	20	21	2.9	10100	Abortion/370 gr
8	4 cm dilated, prolapsed membranes	18	40	2.8	13900	Apgar at the 1st and 5th minutes: 9-10/ 3570 gr
9	4 cm dilated, prolapsed membranes	17	18	2.1	16900	Rupture of membranes after cerclage

WBC: White blood cell count.

neonatal survival has heterogeneous pattern. In a large cohort from ten different centers, benefits of emergency cervical cerclage between 14 and 26 weeks have been reported [9]. In this study, cervical dilatation was greater than 1 cm (between 1 and 10 cm), whereas most had 1 or 2 cm dilatation in the cerclage group. The patients who have a cervical dilatation greater than 4 cm were managed expectantly except one case. Cervical cerclage was performed only in one patient with a cervix dilated above 4 cm. Besides, the statuses of amniotic membranes were not standardized. By a speculum examination in the cerclage group, amniotic membranes were not visible (56%), membranes were visible at the level of the external os (25%), prolapsed into the vagina (15%), or membrane status was not known (<4%) [10]. It has been reported that having non-prolapsed membranes was associated with improved perinatal outcomes following emergency cerclage [11]. Thus, the status of amniotic membranes is an important predictor for the success of cervical cerclage. In our study we have included women with ≥4 cm dilated and prolapsed membranes. Although our live birth rate seems low (%11), the time gained from the application of the cerclage till delivery in women who lost their infants was 3.3 weeks in our study.

Recently, it has been found that cervical cerclage accompanied by long-term broad spectrum antibiotics improves the perinatal outcomes in singleton gestations with prolapsed membranes. The take-home baby rate was 63% in women who underwent cerclage. In this study, the mean external width of cervix before the procedure was 3.3 cm (3–4.5 cm) [12]. External width of the cervix is commonly used in many other studies, but this may be smaller than the internal width which was preferred in our study. Another study, which included patients with a cervix dilated between 1 cm to 4 cm with the presence or absence of prolapsed membranes, has reported some benefits of emergency cerclage on prolonging pregnancy [13]. In our study, we have used strict inclusion criteria to answer the question if emergency cerclage really works in patients with advanced cervical dilatation together with prolapsed membranes. A recent study from Turkey, investigating singletons and twins with fully dilated cervix and prolapsing amniotic membranes (n = 18), has found that the infants ended up in 4 (19%) stillbirths, 3 (14%) neonatal and 1 (5%) infant deaths. The mean prolongation of gestation was reported as 49.3 days [14].

In our study, only one patient had a live infant to take home. The patient had a 4 cm dilated cervix at admission, but she had vaginally delivered four healthy babies before. Grand multiparty may affect the cervical status. Since cervical dilatation above 3 cm can be observed in multiparous women [15] the actual cervical dilatation may be much lower than that was measured at admission. If we exclude this case, the prolongation of pregnancy was between 3 and 35 days in patients with advanced cervical dilatation with prolapsed membranes. Moreover, safety remains still controversial, because as in one patient in our cohort rupture of membranes can also occur during the procedure. Two patients (22.2%) in the cerclage group developed chorioamnionitis which necessitated long hospitalization.

The weakness of our study was gestational age at the admission were significantly higher than expectant management group. Although we have included all women who accept the procedure with intact membranes and without regular uterine contractions or chorioamnionitis, this could be attributed to some reasons such as women in advanced weeks of gestation more easily accept the precedure and take the risks of the operation. We can also speculate that advanced cervical dilatation in earlier weeks tend to faster progress to delivery. Clinicians may also tend to prefer to take the risk of the procedure in higher weeks of gestation. Another weakness was the non-randomization of women which can create a bias of selection in those receiving cerclage or not. But taking the ethical considerations into account, doing such a study would be troublesome and until such randomized studies are available we cannot assert the success of cerclage in women with protruding membranes and having cervical dilatation ≥4 cm.

We can conclude that emergency cervical cerclage does not seem like a rationale option for the patients with an advanced cervical dilation (>4 cm) together with protruding membranes in early second trimester because of the short prolongation time and high complication rate, although it can save some fetuses.

Declaration of interest statement

All authors have no conflicts of interests to declare

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