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Cervical incompetence: comparison the prophylactic and therapeutic procedures

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Abstract

Objective: Cervical incompetence is characterized by painless dilation and effacement of the cervix, usually in the second trimester of pregnancy. Therefore, it results in a premature birth and possibly the loss of the baby due to the shortened gestational length. Cervical cerclage is a surgical suture procedure applied on cervix to keep it close during pregnancy. In this study, we aimed to find the role of prophylactic, therapeutic and emergency cerclage procedures in prolongation of pregnancy.

Methods: We retrospectively investigated 54 patients who admitted to our department, between January 2006 and January 2010, and treated with cerclage procedure. We divided patients into 3 groups as Group 1 (n=29) including patients who were treated with prophylactic cervical cerclage; Group 2 (n=9) including patients who had cervical dilatation less than 2 cm or cervical length of 15 mm or less and performed therapeutic cervical cerclage; and Group 3 (n=16): patients who had a cervical dilatation of 2 cm or more and treated with emergency cervical cerclage. Due to its simplicity and possibility of performing it in ambulatory situations more quickly, we chose McDonald cerclage procedure. We investigated the following parameters: patient age, gestational weeks of cerclage procedure, pregnancy prolongation, week of delivery, birth weights, previous cerclage history, cervical dilatation and complications.

Results: Compared to prophylactic and therapeutic cerclage, no significant difference was observed in terms of fetal life and birth weights. Gestation was prolonged for 5.8 weeks in emergency cerclage group. Of 16 emergency cerclage cases, 6 pregnants had reached the viable limit.

Conclusion: Cerclage is best performed prophylactically before cervical dilatation and effacement, emergency cerclage is associated with a lower success rate than prophylactic cerclage. Emergency cerclage operation may be the fetal life-saving at advanced cervical dilatation and membrane cases.

Key words: Cerclage, cervical insufficiency, preterm delivery.

Servikal yetmezlik: Profilaktik ve acil serklajların karşılaştırılması

Amaç: Servikal yetmezlik genellikle gebeliğin ikinci trimesterinde ağrısız servikal dilatasyon ve silinme ile karakterizedir. Bu nedenle, erken doğum ile sonuçlanan gebelik kaybı görülür. Servikal serklaj işlemi gebelikte serviksi kapalı tutmak için rahim boynuna uygulanan dikiş işlemidir. Biz bu çalışmamızda profilaktik, teapötik ve acil servikal serklajların gebeliğin devamına olan katkısını inceledik.

Yöntem: Kliniğimizde Ocak 2006 ile Ocak 2010 tarihleri arasında yapılan 54 servikal serklaj olgusunu retrospektif olarak inceledik. Hastalar üç gruba ayrıldı: Servikal dilatasyonu olmayan, önceden 2 ya da daha fazla abortus yapan veya ağrısız servikal yetmezliğe bağlı oluşan geç ikinci trimester gebelik kaybı bulunan, profilaktik servikal serklaj uygulanan hastalar Grup 1 (n=29), servikal dilatasyonu 2 cm'nin altında veya servikal uzunluğu 15 mm ve altında olan, terapötik servikal serklaj uygulanan hastalar Grup 2 (n=9) ve servikal dilatasyonu 2 cm ve üzerinde olan ve acil serklaj uygulanan hastalar Grup 3'ü (n=16) oluşturdu. Basit olması ve acil şartlarda hızlı yapılabilmesi nedeniyle bütün hastalarda serklaj tekniği olarak Mc Donald usulü serklaj uygulandı. Hastaların yaşı, serklaj uygulanan gebelik haftası, devam etmesi sağlanan gebelik süresi, doğumun gerçekleştiği hafta, bebek doğum ağırlığı, önceki serklaj öyküsü, servikal dilatasyon varlığı ve gelişen komplikasyonlar incelendi.

Bulgular: Profilaktik ve terapötik serklaj karşılaştırıldığında fetal yaşam ve bebek doğum ağırlıkları açısından anlamlı fark saptanmadı. Acil serklaj grubunda gebelik haftası 5.8 hafta uzamıştır. On altı acil serklaj olgusundan 6'sı yaşayabileceği gebelik sınırına ulaşmıştır.

Sonuç: Servikal dilatasyon ve efasman oluşmadan önce uygulanan profilaktik serklaj işlemi en iyi sonucu vermektedir. Acil serklajın profilaktik serklaja oranla başarısı daha düşüktür. Fakat bu işlem dilatasyon ve membranın görüldüğü vakalarda fetal yaşamı kurtarmaya faydası olabilmesi amacıyla uygulanabilir.

Anahtar sözcükler: Serklaj, servikal yetmezlik, preterm doğum.

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Introduction

Cervical insufficiency is late 2nd trimester or early 3rd trimester gestational loss repeating at second trimester and developing after painless cervical dilatation.[1] Connective tissue of proximal cervix is relatively less. Moreover, if the amount of water within hyaluronic acid in cervical connective tissue increases before pregnancy at term, cervical insufficiency develops. Fast labor history, forceps practices, conization, deep 'leep' practices in previous deliveries also may cause cervical insufficiency.[2] While the incidence is not known clearly, it is seen in between 1/200 and 1/2000 deliveries.[3] It is known that 10% of preterm labors (<37 weeks) in the USA is caused by cervical insufficiency.[3]

The diagnosis is usually established by anamnesis information and examination findings of previous pregnancies. In recent years, measurement of the length of cervical canal by transvaginal ultrasonography is preferred much more in the diagnosis.[4] Passing Hegar dilator #8 through cervical canal during the cervix examination made before pregnancy is another diagnosis method.[1]

Although non-surgical treatments such as bed rest, pharmacological methods, and cervical rings can be used, suture pursing cervix vaginally is still the most frequently used method. Since McDonald has promoted his own cerclage technique named after him, it is still popular due to the possibility of performing cerclage procedure in ambulatory situations more quickly by this technique. It is a fact that cerclage procedure provides a decrease in preterm delivery rates.[5]

In this study, we aimed to find the role of prophylactic, therapeutic and emergency cerclage procedures in prolongation of pregnancy.

Method

We retrospectively investigated 54 patients who admitted to Gynecology and Obstetrics Clinic of the Faculty of Medicine of Atatürk University, between January 2006 and January 2010, and were treated with cerclage procedure due to cervical insufficiency diagnosis. Obstetric histories and previous cervical operations of the patients were recorded. Pregnants who had multiple pregnancies, and found to have premature rupture of membranes and fetal anomaly were excluded from the study. Cervical culture and urinary culture were taken from the patients. All patients were informed about the procedure and potential risks, and their approvals were obtained. Cervical length and dilatation were measured by transvaginal ultrasonography.

Patients were divided into three groups: Group 1 (n=29) including the patients who had no cervical dilatation, had 2 or more spontaneous abortions, had late second trimester losses or spontaneous preterm delivery due to painless cervical insufficiency were treated with prophylactic cervical cerclage; Group 2 (n=9) including the patients who had cervical dilatation less than 2 cm or cervical length of 15 mm or less were treated with therapeutic cervical cerclage; and Group 3 (n=16) including the patients with cervical insufficiency who had a cervical dilatation of 2 cm or more were treated with emergency cervical cerclage.

In all cases, cervical cerclage was applied by mersilen tape (5 mm, $^1/_2$ round blunt point double needle) method under spinal anesthesia or induction anesthesia on dorsal lithotomy position. Before the procedure, all patients were administered 1 g cefazolin prophylaxis or rectal indomethacin, and all patients had bed rest and hydration treatment after the procedure.

The most frequent complications in patients who had cerclage are chorioamnionitis, premature rupture of membrane, and premature contractions. The complications we met were noted. In case of preterm delivery, cerclage strings of patients were removed at 38th gestational week or right after the operation for those who had cesarean section. ANOVA test was performed by using SPSS 10 in statistical evaluation; $p<0.05$ was accepted statistically significant.

Results

Demographic data of patients who had cervical cerclage is shown in the **Table 1.** Each 3 patient groups were similar in terms of maternal age, gravida, parity, and previous abortion numbers. Clinical findings and outcomes of the patients are shown in the **Table 2.** Mean cervical opening observed before the procedure was significantly higher in emergency cerclage group than the other two groups ($p<0.001$). While the gestational week during cerclage procedure was similar in the therapeutic and emergency cervical cerclage groups, it was lower in the prophylactic group ($p<0.001$). Mean delivery week in emergency cerclage group was significantly lower ($p<0.01$), and the fetal birth weight was lower compared to other two groups ($p<0.001$).

Table 1. Demographic details of the patients.

	Group 1 (n=29)	Group 2 (n=9)	Group 3 (n=16)	p
Age	30.6±1	32.7±1.5	29.8±1.3	0.421
Gravida	>4	>4	>4	0.576
Parity	>1	>1	>1	0.338
Abortion	>1	>1	>2	0.866
Alive	<1	<1	<1	0.466

Periods of the groups up to delivery after cerclage procedure were different from each other. The longer prolongation of pregnancy was provided in the prophylactic group while 5.8 weeks of prolongation was provided in the emergency cerclage group (p<0.01). Two of 29 pregnants who had prophylactic cerclage delivered before 28th week due to premature rupture of membrane. Pregnancy did not pass beyond 36th week in none of the patients in emergency cerclage group. On the other hand, pregnancy of totally 22 patients reached 36th week in the prophylactic group (**Table 2**).

Premature rupture of membrane which is one of the most frequent complications developed in the first week in almost half of the patients in Groups 2 and 3. Chorioamnionitis was detected in one patient from each Group 1 and Group 3 (**Table 3**). In 14 (25%) of 54 patients who were applied cerclage had cerclage history in their previous pregnancies. Chorioamnionitis developed in one of the two patients who had cerclage history and were treated with emergency cerclage, and premature rupture of membrane developed in the other patient. Two of the four patients who had cerclage history and were treated with therapeutic cerclage had premature birth at 30th week and 34th week since preterm uterine contractions did not respond to tocolytic treatment. Other two patients reached the term. All of the 8 patients who had cerclage history and were treated with prophylactic cerclage delivered after 36th week. Hospitalization period of the patients who were treated with emergency cerclage was longer than the patients in other groups (2.1±0.6 days in Group 1, 2.3±0.7 days in Group 2 and 4.2±0.7 days in Group 3).

The delivery was done vaginally in 78% of patients while 22% of them had cesarean section. The abortion rate was 16%, preterm labor rate was 27%, and the rate of pregnancy reaching the term was 48%.

Table 2. Clinical parameters of the patients and cerclage outcomes.

	Group 1 (n=29)	Group 2 (n=9)	Group 3 (n=16)	p
Cervical dilatation (cm)	Yok	0.94±0.13	2.30±0.19	0.001
Gestational week at cerclage	15.2±0.3	18.0±1.2	19.5±1.0	0.001
Delivery age (week)	36.0±0.6	33.3±16	25.4±1.3	0.01
Time between cerclage and delivery (week)	20.8±0.7	15.3±1.5	5.8±1.4	0.001
Birth weight (g)	2785.86±131.58	2433.33±330.72	1005.62±205.31	0.001
Preterm delivery (<28 week)	2 (%3)	1 (2%)	10 (18%)	
Preterm delivery (28-32 weeks)	0	2 (3%)	4 (7%)	
Preterm delivery (32-36 weeks)	5 (9%)	2 (3%)	2 (3%)	
Delivery (>36 week)	22 (40%)	4 (7%)	0	

Table 3. Complications observed after cerclage procedure.

	Group 1 (n=29)	Group 2 (n=9)	Group 3 (n=16)
Premature contractions	5 (20%)	2 (8%)	2 (8%)
Premature rupture of membrane	3 (12%)	4 (16%)	7 (28%)
Chorioamnionitis	1 (4%)	0	1 (4%)

Discussion

The incidence of cervical insufficiency is not known clearly due to the problems during diagnosis. However, the rate of cerclage procedures performed varies between 1/180 and 1/1800.[6] When the results of the studies conducted are analyzed, conization, loop electro-surgery excision procedures, excessive dilatation of cervix during termination or exposure to obstetric lacerations and trauma of cervix seem to be the most significant reasons of cervical insufficiency. Congenital anomalies and in utero diethylstilbestrol (DES) have a role in the problem.[7] Previous obstetric history is still the most important diagnosis method.

Cerclage procedure is usually applied prophylactically on patients who are suspected to have cervical insufficiency at the end of first trimester. In some cases, cervical insufficiency is diagnosed at the advanced periods of pregnancy. Cerclage procedure performed in such cases is called as therapeutic or emergency according to the grade of dilatation and effacement. The probability of membrane rupture increases heavily in case that amnion membrane moves to vagina through cervical opening, and pregnancy may result in abortion or premature delivery. In these cases, emergency cerclage procedure can be useful in order to make pregnancy to reach further weeks. In a prospective study comparing emergency cerclage procedure and bed rest, it is shown that cerclage procedure yields better results compared to bed rest in terms of birth weight and week.[8]

Birth week, prolongation of pregnancy, and birth weight of babies were found significantly less in patients who had emergency cerclage than patients who had prophylactic cerclage. Cervical dilatation was shown as the major reason for this case.[9] While success rate is the highest in the prophylactic cerclage group, it is lower in therapeutic cerclage group and the lowest in the emergency cerclage group. Our results also show that success rate decreases as cervical opening increases.

In our cases, gestational week was prolonged 5.8 weeks in emergency cerclage group, and 6 of 16 emergency cerclage cases reached viable gestational limit. This period seems an important gain for pregnancies which are not at viable limit. There is no significant difference between prophylactic and therapeutic cerclage groups in terms of fetal survival rates and baby birth weights. When hospitalization periods of groups after cerclage are compared, it is seen that the longest hospitalization belongs to emergency cerclage patients (4.2±0.7 days). This is because of the additional tocolysis requirements of the patients. There is no randomized study for using tocolytic drug during and after cervical cerclage procedure. We administrated single dose of 100 mg rectal indomethacin before the procedure. Tocolytic treatment was conducted in 19 of 54 patients after the operation. About 57% of these patients were emergency cerclage cases.

The most frequent complications in the patients who had cerclage are chorioamnionitis, premature rupture of membrane, premature contractions, and cervicovaginal fistula.[9,10] In our study, premature uterine contractions were observed in 9 of 54 cerclage cases, premature rupture of membrane in 14 cases and chorioamnionitis in 2 cases. These complications were frequently observed in emergency cerclage cases. Since the number of therapeutic cerclage patients was low, it is hard to make interpretations on the complications.

Cervical ultrasonographic findings of preterm and term deliveries reported in the studies performed at last two decades were analyzed. Performing serial transvaginal ultrasonographic cervical length measurement in pregnants who especially have second trimester or early third trimester gestational losses is accepted as a significant approach to detect cervical insufficiency.[11] In the recent studies, it was found that vaginal progesterone treatment considerably decreases the rate of delivery before 28th week in pregnants of whom cervical length is measured less than 20 mm.[12]

Conclusion

In conclusion, success rate decreases as the amount of cervical dilatation increases. The pregnancy can be prolonged and fetal survival rates can be increased by cerclage process to be performed by early diagnosis.

Conflicts of Interest: No conflicts declared.

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