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Comparison of Therapeutic and Prophylactic Cervical Cerclages and Their Results

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ABSTRACT

Depending on the patient's history, cerclage procedure is called prophylactic cerclage in cases where the cervix has not been dilated or effaced yet. It is called therapeutic cerclage when performed after effacement and dilatation have occurred. Although there is literature arguing that therapeutic cerclages will be reduced with the spread of prophylactic cerclages, and pregnancy will be carried to further weeks; there are also researchers who argue that due to prophylactic cerclages, pregnant women who may not actually need cerclage are intervened and unnecessary procedure-related morbidity increases. In this study, we examined all cerclage procedures and indications performed in our clinic in two years. We tried to contribute to the literature by evaluating the contribution, frequency, and success of prophylactic and therapeutic cerclage procedures.

Hospital records of 160 patients who underwent prophylactic and therapeutic cerclages were reviewed retrospectively.

Birth weeks of patients with a cervical length below 25mm (therapeutic cerclages) were found to be significantly lower than those with a cervical length of 25mm or above (prophylactic cerclages) (p=0.001). Birth weight of the babies of mothers with a cervical length below 25mm was found to be significantly lower (p=0.004).

The success and pregnancy outcomes in therapeutic cerclages are worse than prophylactic cerclages.

Keywords: Cervical cerclage, therapeutic, prophylaxis

Introduction

Preterm birth is defined as labor before 37 weeks of gestation and today, it is still among the leading causes of neonatal mortality and morbidity (1,2). Cerclage is a method that is frequently used to prevent preterm births, especially due to cervical insufficiency and is applied to provide mechanical support to the cervix (1,3). Although a large variety of techniques are used for the cerclage, the cerclage method that is frequently preferred is the McDonald cerclage due to its simplicity and lower complication rates, and it is applied to the cervix, vaginally, by using a non-absorbable suture, that surrounds the cervix without dissecting the surrounding tissues (4).

Anamnesis of patients is very important for the indication of cerclage procedure. Especially in the absence of any other underlying cause in the patient's anamnesis, in case of a history of painless cervical dilation leading to recurrence of second trimester preterm delivery, or in case of risk factors such as conization history, induced therapeutic abortion history, or having Mullerian anomaly, cerclage can often be applied to correct the structural weakness of the cervical tissue (5,6). Additionally, in patients with previous history of spontaneous preterm birth, cervical cerclage is also indicated in cases where the cervical length is less than 25 mm on ultrasound before the 24th week of gestation or there is cervical dilatation or noticeable cervix effacement on physical examination (5).

Depending on the patient's history or risk factors, the cerclage procedure is called prophylactic cerclage in cases where the cervix has not been dilated or effaced yet (3). The procedure is called therapeutic cerclage when it is performed under more urgent conditions to stop preterm birth in the stages after effacement and dilatation have occurred (3). Although there is literature arguing that the frequency of therapeutic cerclage performed under emergency conditions will be reduced with the spread of prophylactic cerclages, and pregnancy will be carried to further weeks, there are also researchers who argue that due to prophylactic cerclages, pregnant women who may not actually need cerclage are intervened and unnecessary procedure-related morbidity increases (3,4,7).

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In this study, we examined all cerclage procedures and indications performed in our clinic in two years. We tried to contribute to the literature by evaluating the contribution, frequency, and success of prophylactic and therapeutic cerclage procedures to the continuation of pregnancy.

Materials and Methods

Design of the Study: This study was carried out with the approval of the ethics committee of our university. Files and hospital records of 160 patients who underwent prophylactic and therapeutic McDonald cerclage at our Gynecology and Obstetrics Clinic between January 1, 2020, and January 1, 2022, were reviewed retrospectively for the study. Patients with painless cervical dilation history leading to recurrent second-trimester preterm delivery or conization history, induced therapeutic abortion history, or with Mullerian anomaly, in the absence of any other underlying cause in the anamnesis, were included in the prophylactic cerclage group. Patients with a cervical length below 25 mm on ultrasound or with a noticeable cervical dilation or effacement on physical examination were included in the therapeutic cerclage group, regardless of a history of premature birth or miscarriage. Inclusion criteria for the study were determined as being diagnosed with cervical insufficiency in our clinic and having the cerclage procedure performed in our hospital, having undergone McDonald cerclage, and being apatient whose files and hospital records could be accessed. Exclusion criteria were determined as having a maternal systemic disease, pregnancy-related or chronic hypertension, gestational diabetes or type 1 diabetes mellitus, premature rupture of membranes, or fetal anomaly.

Statistical analysis: In our study, descriptive statistics are given as numbers and percentages for categorical data, and mean and standard deviation for numerical data. Histogram was used to check for distribution of numeric variables. Student t test was used. Categorical variables were analyzed with chi square test. $p<0.05$ was considered statistically significant. SPSS Statistics 23.0 program was used for data analysis.

Results

160 patients were included in our study, and 57.5% (n=92) of these patients were nulliparous, 28.1% (n=45) primipara, and 14.4% (n=23) multiparous (Figure 1).

Demographic characteristics of all patients in the study (age, procedure week, number of abortions, birth week, and minimum, maximum, mean, and standard deviation values of babies' birth weight) are given in table 1.

When delivery types of patients were evaluated it was seen that 58.1% (n=93) ended with cesarean section and 41.9% (n=67) with vaginal delivery (Figure 2).

When the patients were evaluated, it was observed that there was no significant correlation between the week of cerclage procedure and the birth weeks of the babies, according to the statistical data ($p=0.818$; $r=0.018$) (Figure 3). Similarly, there was no significant correlation between the week of the cerclage procedure and the birth weight of the babies ($p=0.584$; $r=-0.044$) (Figure 3). In addition, when parity status and cervical lengths of the patients were compared, it was seen that there was no statistically significant difference ($p=0.394$).

The patients were divided into two groups according to the cervical lengths during the procedure. Patients with a cervical length below 25 mm were called therapeutic (29.4%; n=47), and those with a cervix length of 25 mm or above and with a history of preterm birth or early pregnancy loss due to cervical insufficiency were called prophylactic (70.6%; n=113) cerclage group (Table 2).

No statistically significant difference was found between the prophylactic and therapeutic cerclage groups in terms of age and delivery method ($p=0.692$, $p=0.415$). However, birth weeks of patients with a cervical length below 25 mm (therapeutic cerclage group) were found to be significantly lower than those with a cervical length of 25 mm or above (prophylactic cerclage group) ($p=0.001$). Additionally, birth weight of the babies of mothers with a cervical length below 25 mm was found to be significantly lower than those with a cervical length of 25 mm and above ($p=0.004$) (Table 3). The mean age in both groups was not statistically significantly different ($p=0.421$). The number of previous abortions was significantly higher in prophylactic cerclage group ($p=0.002$).

Discussion

In our study, when all prophylactic and therapeutic cerclages were considered together, it was found that the cerclage week did not affect the birth week of the babies or the birth weight of the babies. It was also understood that the

Table 1. Demographic Characteristics of Patients In The Study

	Minimum	Maximum	Mean	±	Standard deviation
Age (year)	20	49	31,36	±	5,568
Gestational week (week)	11	28	16,70	±	5,230
Abortus history (n)	1	5	2,72	±	1,053
Birth week (week)	19	40	32,59	±	5,281
Birth weight (gr)	250	4000	2227,53	±	925,717

Table 2. Cervical Length At The Time of The Procedure

	N (number)	Percent (%)
Cervical lenght <25mm (therapeutic)	47	29,4
Cervical lenght ≥25mm (prophylactic)	113	70,6
Total	160	100,0

Table 3. Comparision Of Cervical Lengths With Birth Weeks, Birth Weights And Of The Babies

	CERVICAL LENGHT	N	Mean	±	Standard deviation	P
Birth week (week)	Cervical lenght <25mm	47	30,43	±	5,886	0,001
	Cervical lenght ≥25mm	113	33,50	±	4,751	
Birth weight (gr)	Cervical lenght <25mm	47	1812,66	±	1023,405	0,004
	Cervical lenght ≥25mm	113	2319,56	±	979,409	
Prolongation of pregnancy	Cervical lenght <25mm	47	11,2	±	7,21	0,001
(week)	Cervical lenght ≥25mm	113	18,4	±	4,27	

increase in the parity of the patients was not a factor affecting the current cervical length.

When patients were divided into therapeutic and prophylactic cerclage groups; birth week, birth weight of babies, and prolongation of pregnancy were found significantly higher in the prophylactic cerclage group. In addition, since the cerclages performed due to the history of preterm birth or recurrent abortion based on anamnesis are mostly included in the prophylactic cerclage group, when the number of previous abortions is examined, it was observed that the history of abortion increased significantly in the prophylactic cerclage group.

When our study is evaluated, it is seen that the cervix length is the most important factor in obtaining positive pregnancy results (such as prolongation of pregnancy, gestational week, or increase in birth weight), and the length of the cervix being below or above the limit of 25mm affects the positive pregnancy results significantly.

When the literature is examined, it is seen that there are not many studies comparing prophylactic and therapeutic cerclage. In a study similar to ours by Liu et al., it is seen that pregnancy outcomes were more unsuccessful in patients determined as the therapeutic cerclage group compared to the prophylactic cerclage group (3). Liu et al. found that in the prophylactic group, the prolongation of pregnancy was higher, the pregnancy could be carried to further weeks, and adverse pregnancy outcomes such as preterm birth or premature

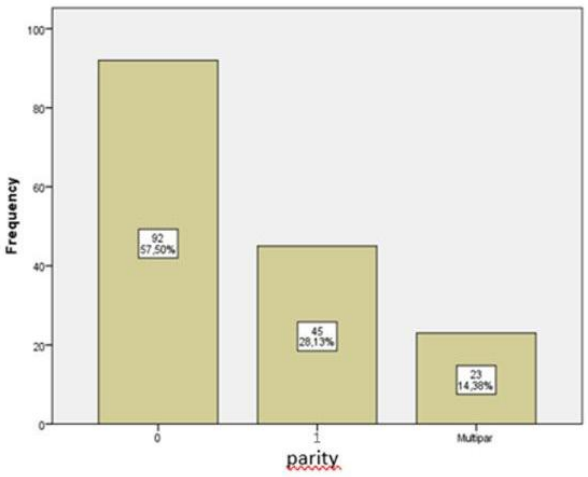

Fig. 1. Parity of The Patients Included In The Study

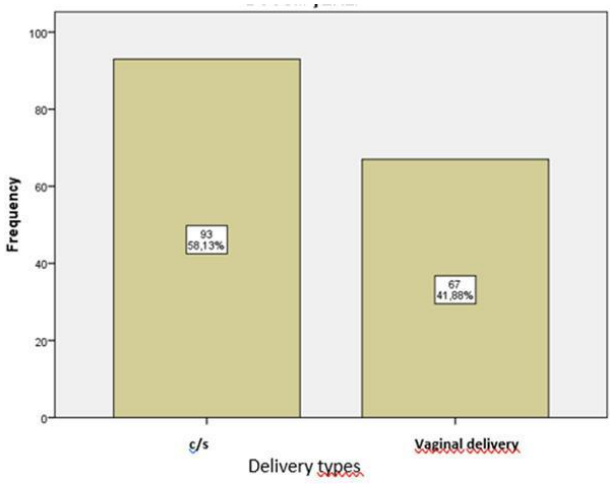

Fig. 2. Delivery Types of The Patients

rupture of membranes were less. They probably attributed these superior effects of prophylactic cerclage to the better anatomical support of the cerclage sutures placed before the isthmus part of the cervix shortens, and to the more successful results of cerclage (3).

In a meta-analysis conducted in recent years, it has been demonstrated that elective cerclages are related to more successful pregnancy outcomes and are less likely to cause complications such as premature rupture of membranes compared to emergency cerclage applications which support our results (8). Similarly, many different studies in the literature support the superiority of prophylactic cerclage (9,10). On the other hand, some studies comparing elective and emergency cerclage did not reach such significant differences in terms of pregnancy outcomes (11-13). These results may also be related to the insufficient number of patients. In the literature, studies comparing prophylactic and elective cerclages mostly have a much smaller number of patients

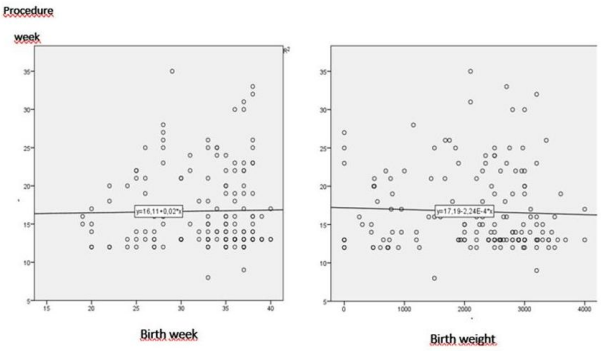

Fig. 3. Box plot graphics showing the relationship between cerclage procedure week, the birth week, and the birth weight of the babies

compared to our study. The common feature of all these studies is that the number of prophylactic (elective) cerclages is much higher than the emergency (therapeutic) cerclages. Although it is thought to have more successful results on pregnancy outcomes, in fact, it is also possible to say that prophylactic cerclage application leads to a surgical intervention that may not be required in many patients and causes a relatively over-treatment condition.

In their study, Korb et al. examined the patients in two groups as high and low-risk groups according to their previous preterm birth or spontaneous abortion numbers and whether their previous cerclage history was successful or not (14). They showed that the contribution and success of cerclage to pregnancy outcomes was less in the high-risk group than in the low-risk group. In the study they designed, unlike our study, they formed the groups completely according to the anamnesis and all of them were performed prophylactic cerclage at 12-14 weeks of gestation. Although they found that the pregnancy results were worse in patients with more preterm births and more miscarriages; in our study, the cerclage success was better in the group with more abortion history (prophylactic cerclage group) (14). We see that this difference is due to the shorter cervical lengths of the therapeutic group, although the number of abortions was lower in our study. In other words, we can say that cervical length is a more important indicator of cerclage success than anamnesis-based risk factors.

In our study, we divided the patients into two groups according to a cervical length: cervical length <25 mm (therapeutic) and cervical length ≥25 mm (prophylactic). In a meta-analysis, it was concluded that performing cerclage in patients with a cervical length below 25 mm, was effective regardless of the size of the cervical length (15). In the meta-analysis, it was shown that the

application of cerclage affected success for all cervical lengths below 25mm, regardless of the amount of cervical shortening (15). In the light of this information, we can say that evaluating cervical shortening as below and above 25 mm can be a practical and useful indicator in showing cerclage success, and we can use 25 mm length as a limit.

In routine practice, we usually perform McDonald's cerclage in our clinic. Therefore, since the number of Schirodkar style cerclages is much less, we could not include these cerclages in the study in order not to affect the results of the study. This is a limitation of our study. If there was much more patients underwent to Schirodkar procedure, we could discuss McDonald's cerclage with Schirodkar style cerclage and we had data about proflactic and theraupeutic Schirodkar style cerclage.

The success rate and pregnancy outcomes in therapeutic cerclages performed under emergency conditions are worse than in prophylactic cerclages performed with indications based on risk factors obtained from previous obstetric history. Although many factors seem to affect cerclage success, it is observed that the most important factor is the length of the cervix and it is the most effective indicator all by itself in showing the prognosis of cerclage, independent of other factors.

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