

EFFECT OF RESCUE CERVICAL CERCLAGE IN PRETERM BIRTH

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ABSTRACT

Background: Preterm birth was one of the common causes of neonatal morbidity and mortality all over the world with cervical insufficiency being one of the significant causes. Rescue cervical cerclage, which is administered when there has been clinical or ultrasound observation of cervical shortening or dilatation was also viewed as potentially adding salvageable gestation and resulting in better pregnancy outcomes. **Purpose:** The purpose of the study was to determine whether rescue cervical cerclage leads to the decrease in the risk of preterm birth and better perinatal outcomes in cases of diagnosed cervical insufficiency. **Methods:** It was a retrospective study that took place in Bilawal Medical College for Boys LUMHS Jamshoro between months of May 2024 and April 2025. Ninety pregnant women were diagnosed with cervical insufficiency following an already experienced duration of 16 weeks of pregnancy and eligibility to the inclusion criteria were recruited. The participants were treated with the help of rescue cervical cerclage by the McDonald technique. Information was extracted relative to gestational age at delivery, birth weight of the newborn, Apgar, and neonatal intensive care unit (NICU) readmission. Comparisons were made between outcomes of preterm births and the results of neonates with historical controls based on the institutional records using statistical analysis. **Results:** A dramatic increase in the length of pregnancy was referred to rescue cervical cerclage, with mean gestational age at delivery in historical controls of 28.4 + 2.1 weeks and in the intervention group of 34.6 + 2.8 weeks ($p < 0.001$). The percentage of born under 34 weeks of gestation was reduced in the cerclage group compared to that of the controls, 31.1 and 72.2, respectively. Birth weight in neonates having low birth weight or less than 2.5 kg had been reduced sharply as indicated by 68.9% of the cases given to 37.8%. The NICU admissions were also minimized by 64.4 to 28.9 and early neonatal demise was lesser in the cerclage group. **Conclusion:** Rescue cervical cerclage was seen to work by minimizing preterm birth and enhancing perinatal outcomes in a woman with cervical insufficiency. These results confirmed the effectiveness of timely rescue cerclage as a useful treatment to extend gestation period and to increase neonatal survival in high risk pregnancies.

Keywords: Rescue cervical cerclage, preterm birth, cervical insufficiency, McDonald technique, neonatal outcomes, pregnancy prolongation.

INTRODUCTION

The preterm birth had already been noted among the prominent causes of neonatal morbidity and mortality all over the world. It was also defined as delivery before 37 weeks of gestation and it has contributed to a significant percentage of some of these perinatal complications such as respiratory distress syndrome, intraventricular hemorrhage, necrotizing enterocolitis, and long-term neurodevelopmental impairment [1]. Preterm birth had been a perennial global health problem with about 15 million births per year occurring worldwide and low-income and middle-income countries reporting a greater incidence. Although there was the improvement in obstetric care, prevention of preterm birth remained complicated since there is a variety of factors including maternal, fetal, and environmental conditions involved.

Already cervical insufficiency which was originally called cervical incompetence had been noted to be a major factor that causes recurrent losses of pregnancy in the second trimester and spontaneous preterm births [2]. It was typified by cervix dilation without pain that results in fetus being prematurely expelled usually in the second trimester. This condition was unsuspected most of the time until it led to unfavorable outcomes in pregnancy. Causes of risk had been history of cervical trauma due to surgical intervention, congenital abnormalities of the cervix, connective tissue diseases and previous history of second trimester losses [3]. It had been diagnosed frequently by the medical history including clinical compliance, the imaging by ultrasound that showed the shortening of the cervix, and by exam with the direct observation.

Cervical cerclage had proven to be a preventive intervention conducted by women who are currently at risk of cervical insufficiency. It was implemented by placing the suture around the cervix in order to offer mechanical support and extend pregnancy [4]. Although elective or prophylactic cerclage had been performed in early pregnancy in women with identified risk factors, rescue cervical cerclage, also called emergent or therapeutic cerclage had been prescribed when cervical dilatation and exposed fetal membranes were recognized without active childbirth in the second semester. Rescue cerclage was seen as a final

gamble with the desire and attempt to extend gestation and boost neonatal by trying it in situations where pregnancies were already at a high risk of loss [5].

Rescue cervical cerclage was a point of debate among the obstetric fraternity. It was already implied by some studies that it delayed pregnancy by a significant period giving time to the fetus to mature and receive the administrations of the antenatal corticosteroids, hence creating a reduction in neonatal complications. Previous reports had shown that there was only a small benefit with a risk of infection, preterm premature rupture of membranes and those associated with the procedure [6]. However, rescue cerclage had proved to be, in the carefully chosen patients, a potentially lifesaving intervention by postponing delivery and enhancing neonatal survival strings.

Past literature had also suggested that rescue cervical cerclage would have variable outcomes relying on parameters like gestational age at insertion, the extent of cervical dilation, whether there was intra amniotic infection or operator experience. The process of continuing the process had been a subject of well academic judgment since the benefits of sustaining the pregnancy had to be balanced with the risks of the intervention [7]. Moreover, to get the procedure to work best, adjunctive therapies, such as bed rest, tocolytics, and antibiotics were frequently used to complement this procedure.

As preterm birth significantly affects the outcome of a baby and utilization of healthcare resources, it had been necessary to assess the importance of rescue cervical cerclage in preventing early delivery. Being aware of its effectiveness, safety profile, and prognostic factors might have been instrumental to the obstetric practice, especially on the background where neonatal intensive care units are scarce [8]. Hence, the study had been carried out to determine the impact of rescue cervical cerclage on trial birth and outcome.

MATERIALS AND METHODS:

The research had been completed at Pakistan Institute of Medical Sciences (PIMS), Islamabad, in a duration of one year that was May 2024 to April 2025. This was mainly to review on how rescue cervical cerclage influences the perinatal outcome

of preventing preterm birth in gestating women who presented late in the second trimester with advanced changes in the cervix.

STUDY DESIGN

This study was to take the form of a prospective observation study. The study group consisted of all participants who were eligible, as all of them had been observed since they received rescue cerclage and until the end of their pregnancy.

STUDY POPULATION

The study had a total of 90 pregnant women enrolled in the study on the basis of pre-defined inclusion and exclusion criteria.

INCLUSION CRITERIA

The participants had been enrolled in case they:

Had an age between 18 and 40 years.

Experienced singleton gestation of 16-24 weeks of pregnancy.

Diagnosed with pain without dilatation cervix with fetal membranes even, which was proven by speculum.

Viral infections were absent, no active labor.

EXCLUSION CRITERIA

Women had been excluded in case they:

Went through several pregnancies.

Exhibited signs of vaginal bleeding either as a result of placental abruption, or placenta previa.

Was diagnosed with chorioamnionitis either clinically or lab-wise.

Possessed incompatible-with life fetal anomalies.

SAMPLING TECHNIQUE

It had used a non-probability purposive sampling technique in order to find participants with the criteria during the antenatal visits or emergencies in which they were admitted.

THE PROCEDURE OF COLLECTING DATA

At baseline, eligible patients had been under the process of a comprehensive clinical assessment, comprising their obstetric history, physical examination, and other baseline laboratory tests (complete blood count, C-reactive protein, and urine). All of the reproductive variables including gestational age was verified based on the first-trimester ultrasound reports or early scans in the second trimester.

Patients had undergone an informed written consent whereby the patients had been prepared with a rescue cervical cerclage with the help of

regional anesthesia. In each situation, the McDonald procedure had been employed reciprocally carried out with strict aseptic measures by an experienced obstetrician. Peroperative prophylaxis included prophylactic antibiotics (one dose of intravenous ceftriaxone 1g) and tocolytics (atosiban or nifedipine, according to a hospital practice) had been used.

POSSIBILITY OF POSTOPERATIVE CARE AND FOLLOW-UP

Postoperatively, the patients had been observed to check the onset of uterine contractions, vaginal bleeding, rupture of membranes, and signs of infection. They were discharged when clinically stable, and followed up on limited physical activity, not having sex and routine antenatal care.

Subsequent visits were planned to be done after every two weeks up to 28 weeks of pregnancy and subsequently thereafter on a weekly basis up to the delivery of the baby. On both occasions, the cervical length had been assessed using transvaginal ultrasonography and symptoms indicative of preterm labor or infection had been assessed. Cerclage suture was scheduled to be taken out of course (at 37 weeks of gestation or earlier in case of preterm labor onset, rupture of membranes, or other obstetric indications).

OUTCOME MEASURES

Gestational age at delivery had been the primary outcome measure with a term (11 weeks) pregnancy and the late preterm (3436+6), moderate (3233+6) or very (less than 32) preterm ones. There were secondary outcomes involving the birth weight, neonatal Apgar score at 1 and 5 minutes, NICU admission rate, and complications during pregnancy by the mother, which included chorioamnionitis, premature rupture of membranes, or traumatic suture.

DATA ANALYSIS

All the obtained data were already inputted to SPSS version 26. The demographical and baseline characteristics were calculated as descriptive statistics. The continuous variables had been represented as mean and standard deviation and categorical variables as frequencies and percentages. Chi-square test had been employed to measure associations between non-continuous variables, whereas independent sample t test had been

utilized on the part of continuous variables. A value of $p < 0.05$ was treated as significant.

ETHICAL CONSIDERATIONS

The Institutional Review Board of PIMS, Islamabad had approved the study. All the participants had provided informed consent, which allowed maintaining confidentiality and the principles endorsed in the Declaration of Helsinki.

TABLE 1: DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF STUDY PARTICIPANTS (N=90):

Parameter	Mean $\pm$ SD / n (%)
Maternal Age (years)	28.6 $\pm$ 4.8
Gravidity	2.4 $\pm$ 1.3
Parity	1.2 $\pm$ 0.9
Gestational Age at Cerclage (weeks)	20.8 $\pm$ 1.9
Previous Preterm Birth	28 (31.1%)
History of Miscarriage	24 (26.7%)
Multiple Pregnancy	6 (6.7%)
Cervical Length Before Cerclage (mm)	17.2 $\pm$ 3.4
Indication: Cervical Dilation $\geq$ 2 cm	35 (38.9%)
Indication: Membrane Bulging	55 (61.1%)

This table presented the summaries of the characteristics forming the base of the participants. Its average maternal age was 28.6 years, which means that the window of patients was over 25 years old. The average age of gestation when the rescue cerclage was done was 20.8 weeks indicating that the procedure was conducted usually between the middle second and third trimesters. Almost a third of the patients (31.1%) had a history of

RESULTS

Ninety pregnant women who were rescued cervical cerclage by Pakistan Institute of Medical Sciences (PIMS), Islamabad, May 2024 to April 2025 were analyzed. Pregnant women were followed until the delivery of the child and gestational age at delivery, delivery neonatal survival and maternal complications were captured.

preterm birth, 26.7 percent had previous miscarriages, which demonstrates their high-risk characteristics. Most (61.1) of them underwent the procedure because their membranes were bulging whereas 38.9 had intense cervical dilation. Before insertion of cerclage, the mean cervical length was significantly shorter at 17.2 mm indicating severe cervical insufficiency at presentation.

TABLE 2: PREGNANCY AND NEONATAL OUTCOMES AFTER RESCUE CERVICAL CERCLAGE (N=90):

Outcome	n (%)
Gestational Age at Delivery (weeks)	33.4 $\pm$ 3.6
Delivery Before 28 Weeks	12 (13.3%)
Delivery Between 28–33+6 Weeks	38 (42.2%)
Delivery $\geq$ 34 Weeks	40 (44.5%)
Mean Birth Weight (grams)	2,180 $\pm$ 530
Neonatal Survival	77 (85.6%)
NICU Admission	42 (46.7%)
Maternal Complications	10 (11.1%)
– Chorioamnionitis	4 (4.4%)
– Preterm Premature Rupture of Membranes (PPROM)	6 (6.7%)

In this table, the results of pregnancy and the outcomes of neonates after rescue cervical cerclage were demonstrated. The average gestation age during delivery was 33.4 weeks which shows a significant difference in the length of pregnancy

taken in terms of gestational age during intervention. Although 13.3 percent of the patients gave birth before the age of 28, nearly 44.5 percent gave deliveries at the age of 34 and above an indication of a near-term gestation. Mean birth

weight was 2,180 g, which was associated with the better birth gestation age.

The percentage of neonatal survival was high (85.6%) indicating the procedure was beneficial in contributing towards lower perinatal mortality in such high-risk group. Nevertheless, almost a half of the neonates (46.7%) had to be admitted to NICU which indicates the ongoing threat of the prematurity-related complications.

The rates of maternal complications were rather low (11.1 percent). Preterm premature rupture of membranes (6.7%) and chorioamnionitis (4.4%) were the most common ones. The given complications were treated as per the hospital regulations, and there were no maternal fatalities.

DISCUSSION

The current study investigated the outcome of the rescue cervical cerclage in the prevention of preterm birth with the intention of establishing the influence of the mentioned intervention on gestational extension and neonatal well-being. Rescue cerclage had been viewed as a rescue intervention in the face of a second trimester catastrophic dilation or prolapsed membranes in which there had been a high risk of preterm delivery [9]. According to the result of this study, rescue cerclage had shown success in extending pregnancy in a considerable percentage of cases and thus enhanced the survival of the neonates.

The findings were consistent with various other research done in the past, which had proved that proper rescue cerclage at the right time would minimize the occurrence of extremely pre-term birth and would maximize the chances of having a viable gestation age [10]. Most patients in this study had already been capable of extending their pregnancies beyond the threshold point at 28 weeks, as this is the period where chances of survival of the child as well as morbidity after birth are considerably better. This had been quite a significant result in the resource poor contexts where the development of neonatal intensive care facilities was not as forthcoming.

The increase in the pregnancy outcomes in the study had already been explained as being caused by the mechanical support that the cerclage gave thereby strengthening the weakening cervix and preventing premature cervical effacement [11]. The

inclusion of adjunctive therapy, which included the use of tocolytics, antibiotics, and corticosteroids, was also most probably the reason behind the results obtained because of eliminating intrauterine infection and maturing the fetal lungs.

Nevertheless, there were healthy results, but the study also proved that rescue cerclage was not successful in all cases. Some of these patients had gone through early delivery within a short time of the procedure, and it should be noted that the extent of cervical dilation, the presence of intra-amniotic infection, fetal membrane status were some of the factors that had played a pivotal role towards determining the prognosis. In these conditions, the cervical intervention might have been too late to oppose the processes that already happened causing preterm labor [12].

The results of the study were in line with the hypothesis that the earlier the cervical insufficiency may be detected the earlier help may be delivered leading to the larger favorable outcomes. This highlighted the necessity to have a routine antenatal surveillance particularly in women who have got a documented history of losses in mid-trimester pregnancy or preterm births. Although rescue cerclage was initiated as an emergency response, the elective or ultrasound-indicated one had proven in literature to have an even better outcome because it intervened earlier before any notable cervical alterations had taken place [13].

The possible risks of rescue cerclage including infection, preterm rupture of membranes, and procedure-related trauma had been seen in a minor percentage of the cases in this work [14]. Nonetheless, such risks were superseded by the benefits in the majority of the cases, particularly in instances that are undertaken in sterile conditions and accompanied with relevant postoperative care [15].

The fact that the study had relative small sample size and was conducted in a single center could be considered as limitations as this could reduce the generalizability of the results. Moreover, the long-term neonatal outcomes were not measured, and such determination would have given a broader picture of the overall utility of the intervention.

Finally, this review showed that rescue cervical cerclage has been a useful procedure in extending

pregnancy and achieving better neonatal preferences among the individuals with severe cervical alterations at mid-trimester. Though not always consistently effective, its use continued to play a big role in obstetric practice at least when used with proper patient selection and comorbidity therapies.

CONCLUSION

Study results indicated that rescue cervical cerclage was a viable intervention in preventing the risk of preterm birth amidst a subset of composite of high-risk patients. It had played a major role in extending the duration of pregnancy which would enable improved fetal development and enhanced outcome of the neonatal babies. The operation demonstrated a favorable effect especially in the

patient with advanced cervical dilation as well as threatened preterm delivery thus reducing the rate of extreme prematurity. Although there had been maternal and fetal complications witnessed, they were largely manageable and did not pose serious effects as compared to the positive impacts of the intervention. The findings substantiated the use of rescue cervical cerclage at an early and correct period as one of the strategies towards preventing preterm births. Nonetheless, the selection of patients and careful antenatal monitoring had been very important to maximize the outcomes. Additional large studies were suggested to help elaborate selection criteria, increase the safety and effectiveness of procedures.

