Success Rate of Cervical Cerclage in Preventing Preterm Labour

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Abstract

Objective: To determine the success rate of cervical cerclage in preventing preterm deliveries in patients having cervical incompetence.

Study design: Descriptive (cross sectional) hospital based study.

Place and duration of study: Department of obstetrics and Gynecology, Khyber Teaching Hospital Peshawar. One year from 1st January 2013 to 1st January 2014.

Methodology: Seventy five subjects were selected by consecutive (non-probability) sampling technique. The sample size was calculated by keeping success rate of cervical cerclage as 73.3%, confidence level of 95% and precision of 10%. All the patients were having a history of two or more recurrent midtrimester abortions or preterm deliveries and were subjected to cervical cerclage (McDonald suture). Age, gravidity, parity of the patients, gestational age at delivery, weight of the baby and apgar score was determined. Success rate of cervical cerclage was calculated.

Results: The average age, Gravida and para of the patients were 28.35± 3.96, 5.33±2.36 and was 1.7±1.46 respectively. Results were evaluated on the basis of pregnancy prolongation. Most of them (69%) delivered at term (>37 weeks), 17.3% had preterm deliveries (28-37weeks) and 17.3% had abortions (12-28weeks). Sixty four percent of babies had birth weight of 2.5kg or more and 36.0% had birth weight of less than 2.5kg. Fetal survival rate (good apgar score) was 76%. Overall success rate of cervical cerclage was 80%.

Conclusion: Application of cervical cerclage in pregnant women with previous preterm delivery reduces the preterm delivery rate at a reasonable cost with no additional risk to the mother and the fetus.

Keywords: Cervical cerclage; Preterm delivery; Cervical incompetence; Transvaginal ultrasonography

Introduction

Cervix is labeled incompetent when it is unable to retain an intrauterine gestation until term. It plays a fundamental role in supporting a pregnancy and preventing ascending infection. Infection is associated with preterm delivery in half of the cases [1]. Whatever the etiology of preterm delivery, dilation of the cervix is a common end point.

Preterm delivery is associated with immediate and long term neonatal complications. Immediate complications include infection, respiratory distress syndrome, hyper bilirubinemia and necrotizing enterocolitis. The long term complications include cerebral palsy, nuero developmental delay and chronic lung disease [1].

Cervical cerclage is a surgical procedure involving suturing the cervix with a purse type stitch to keep it closed during pregnancy [2]. Cervical cerclage can be done preventably at 12 to 14 weeks before the cervix thins out. Cervical insufficiency has no consistent definition, but is usually characterized by dilatation and shortening of the cervix before the 37th week of gestation in the absence of preterm labour, and is most classically associated with painless, progressive dilation of the uterine cervix in the second or early third trimester resulting in membrane prolapse, premature rupture of the membranes, midtrimester pregnancy loss, or preterm birth. Cervical insufficiency arises from the woman's inability to support a full-term pregnancy due to a functional or structural defect of the cervix [3].

Main indications of cervical cerclage are previous second trimester pregnancy loss or delivery that occurred with few or no contractions and cervical trauma or injury leading to cervical incompetence [2].

Cervix is labeled incompetent when it is unable to retain an intrauterine gestation until term. It plays an important role in supporting a pregnancy and preventing ascending infection. Infection is associated with early preterm delivery in half of this cases [3]. Whatever the etiology of preterm delivery; dilation of the cervix is a common end point.

Diagnosis is mostly clinical. Past obstetrical histories of recurrent mid trimester miscarriages or preterm delivery are the basis of cerclage. Perspeculum or digital examination may show patulous or bulging membranes and may confirm diagnosis but have not shown to improve outcome [4]. Ultrasound is the principal modality used during pregnancy to measure cervical length and opening, in non-pregnant ladies Hegar's test, Foley's catheter extraction, Hysterogram and Hysteroscopy can be used. Cervical resistance index and cervical compliance score are other investigations [4].

Previous preterm delivery has been shown to be a major risk factor for preterm delivery. History of one previous preterm delivery has been shown to be associated with a recurrence risk of 17 to 40%, the risk increasing with the number of preterm birth [5]. More than 85%
long term disabilities and in otherwise healthy babies and 75% of death among newborns occur as a result of preterm delivery [6]. Cerclage has been reported to improve cervical length and restore cervical anatomic relationships [7]. It has been suggested that cerclage placement closer to internal or may be associated with improved perinatal outcome [8].

Since the development of transvaginal ultrasound, short cervical length has been recognized as one of the most accurate predictor of preterm birth. Short cervical length i.e less than 25 mm is considered incompetent when uterine contractions are absent [9]. Transvaginal ultrasound of the cervix has been studied as a screening test for this important condition. It has been shown to be safe, acceptable and reproducible [10]. It recognizes an early asymptomatic phase that precedes symptomatic preterm labor or pre-mature rupture of membranes better than manual examinations [11] and has been shown to be one of the best predictor of preterm birth. A screening test such as transvaginal ultrasound can be beneficial only if an effective intervention can prevent the outcomes. The only two previous trials on cerclage as an intervention to decrease preterm birth in women with a short cervix that was found on transvaginal ultrasound have shown contradictory result [12,13].

The effectiveness of cervical cerclage in women with cervical incompetence using Mc Donald procedure increased the rate of term deliveries to 95.4%. The mean gestational age at delivery was 35 weeks [14]. 7.5% of miscarriages, 18.7% of premature deliveries, 73.7% of term deliveries and 85.1% of fetal survival rate (good apgar score) were observed after cervical cerclage in patients having sonographically incompetent cervix [15].

Observational studies show that in classical cases with a severely traumatized or virtually absent cervix, neonatal survival may be up to 93% after effective cerclage as compared to 27% before the cerclage [16].

Methodology

It was a cross sectional descriptive study and was completed in 1 year, January 2013-January 2014. The study was conducted in the Department of Obstetrics and Gynecology, Khyber Teaching Hospital, Peshawar, Pakistan. The sample size was 75. The sample size was calculated, keeping the success rate as 73.3% with cervical cerclage, confidence level of 95% and precision of 10%. The sample technique was non-probability consecutive sampling.

All those pregnant women who were having previous history of preterm deliveries and cervical length of less than 25 mm on trans vaginal ultrasound were included in the study. The exclusion criteria for the study were that pregnant women having preterm deliveries due to pre eclampsia and eclampsia (iatrogenic preterm delivery because patients are induced), multiple pregnancies (preterm delivery due to over distended uterus) and polyhydramnias (preterm delivery due to pre labour rupture of membranes).

Patients were enrolled from the antenatal clinic of Khyber Teaching Hospital, Peshawar and included in the study after fulfilling the diagnostic criteria of having history of preterm deliveries or having cervical length of less than 25 mm on trans vaginal ultrasound. After getting permission from the ethical committee, an informed written consent was taken as part of ethical practice. Age, obstetrical history, history of current pregnancy, gestational age was recorded. Trans vaginal ultrasound was taken into account. To control any bias ultrasound was done from the same ultrasonographer and using standardized ultrasound facility available in the hospital.

Cervical cerclage was performed under general anesthesia using Macdonald’s techniques [17]. After surgery they were observed in the ward for two days. Antibiotics prophylaxis with amoxicillin 500mg 8 hourly and metronidazole 400mg 8 hourly 5 days and pentazocine 60 mg 8 hourly for 24 hours were given. After discharge they were seen a week later at the antenatal clinic and during routine antenatal visits thereafter. In absence of complications, the cerclage stich was removed at 37 completed weeks. However, the stich was also removed earlier if there were persistant contractions not amenable to tocolytic drugs or if there was rupture of fetal membrane.

Confounding variables like genital tract infections, uterine anomalies, fibroid uterus and contraceptive device were controlled on the basis of detailed history, physical examination and performing ultrasonography from radiology department of Khyber Teaching Hospital, Peshawar. Antenatal checkups were done according to protocol. During antenatal visits any complications arising were treated accordingly. Those patients presenting in labour room, their detail examination including per abdominal, per vaginal if indicated and per speculum were done. Gestational age at the time of delivery, Apgar score at 5min and weight of the baby were noted. All the data was collected by using Performa questionnaire.

All the collected information was entered in software SPSS version 10 and analyzed through its statistical package. Quantitative variables like age, Gravidity, parity was presented as mean and standard deviation. Qualitative data like gestational age at the time of delivery, weight of the baby and Apgar score were presented in the form of frequencies and percentages. Success rate of the term deliveries after application of cerclage was calculated. Results were in the form of tables.

Results

This was a descriptive study of 75 patients to whom cervical cerclage was applied based on having history of previous two mid trimester losses or preterm deliveries in Obstetrics and Gynecology, Department of Khyber Teaching Hospital, Peshawar, Pakistan.

Table 1 indicates the socio-demographic characters of the patients with cervical cerclage. Average Age of the patients was 28.35 ± 3.96 years. Most of the patients 42 (56%) were in the age group of 26-30 years, 19 (25%) were in the age group of 20-25 years, 9 (12%) were in the age group of 31-35 and 5(6.7%) were of age >35years. Average Gravida of patients was 5.33 ± 2.36. Among the 75 patients most of them 46 (61.3%) were of gravida 2-5, 23 (30.7%) were of gravida 6-9 and 6(8%) were more than 9 gravida. Average parity of patients was 1.7±1.46.

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Table 1: Socio-demographic features of the patients with cervical cerclage.
Among the 75 patients most of them 52 (69.3%) were having parity of 0-2, 22 (29.3%) were having parity of 3-5 and 1 (1.3%) were having parity of >5. Gestational age after application of cervical cerclage was analyzed. Among the 75 patients, 49 (65.3%) were delivered at term (>37weeks), 13 (17.3%) had preterm deliveries and 13 (17.3%) also had abortions.

Table 2 indicates the maternal and fetal outcomes of the patients with cervical cerclage. Three out of 75 patients (4%) had placental abruption and 1 out of 75 patients (1.3%) developed chorioamnionitis between the gestational ages of 28-37 weeks due to which cervical cerclage was removed electively at 34 weeks. Most of the patients 60 (80%) were having normal vaginal delivery while 15 (20%) went through caesarean section. Among the 75 patients, weight of the baby after application of cervical cerclage was observed. Most of them 48 (64.0%) had birth weight of more than or equal to 2.5 kg while 27 (36%) had infant birth weight of <2.5 kg. Apgar score at 5 minutes (fetal survival) of all the 75 patients was observed. Most of them 57 (76.0%) had Apgar of more than 7 while 18 (24%) had Apgar of less than 7.

Table 3 indicates the success rate of cervical cerclage in different age groups. The overall success rate of cervical cerclage was observed in 60(80%) cases, among which the success rate was high in the age group of less than 30 years.

**Discussion**

Cervical cerclage is applied to prevent preterm delivery and hence the complications of preterm delivery. Cervical incompetence is recognized in reproductive age group due to its clinical impact on the reproductive function which is apparent from our study which was stratified among the age which shows that the success rate was high in the age group of less than 30 years.

Most of our patients 52 out of 75 (69%) were of low parity (0-2) which is quite reflective of the condition that leads to adverse outcome. The same is supported by a study done in 2004 by shennan A [15].

It was observed in the study that 65.3% of the patients (49 out of 75) after application of cervical cerclage delivered at a gestational age of >37 weeks, 17.3% (13 out of 75) had preterm deliveries i.e. they delivered at a gestational age between 28-36 and in 17.3% (13 out of 75) pregnancy loss occurred i.e. patients aborted at gestational age between 12-28 weeks. This is in accordance with the study done by Shamshad et al who conducted a descriptive cross sectional study over a 2 years period on patients having history of 2 or more recurrent mid trimester abortions/preterm deliveries. They reported 73.7% of term delivery after application of cervical cerclage. 18.7% of premature delivery and 7.5% of miscarriages. Another study by Clen et al [18] also demonstrated 76% of term deliveries, 12% preterm deliveries and 10% of abortions. The slight difference of term delivery in our study (65.3) as compared to the 73.7% reported by Shamshad et al and 76% reported by Clen et al. [16] was because we took the cut off value of term delivery at >37 weeks gestation while they considered 35 weeks gestation as term pregnancy. Moreover we had to remove the cerclage electively from 2 out of 75 patients (2.6%) at 35 weeks gestation due to the complain of decrease fetal movements as they had bad previous obstetrical history.

Good Apgar score at five minutes after birth is a sign of better survival of neonate. In our study 57 out of 75 patients (76%) had good Apgar score at 5 minutes i.e. more than 7. This means that cervical cerclage improves fetal survival rate which is also supported by previous studies [19].

Low birth weight babies i.e. <2.5 kg have high perinatal morbidity and mortality. In our study 48 out of 75 (64%) had birth weight of more than or equal to 2.5 kg which shows that cervical cerclage improves neonatal survival and decreases perinatal morbidity. This has also been demonstrated by Ezeki OC in a study conducted in 2004 [1] which demonstrated 71% of babies having birth weight >2.5 kg. This slight difference in our study may be due to the fact that the people of our setup were poor and were having low socioeconomic status which might have contributed to the low birth weight babies.

Overall success rate of cervical cerclage was found to be 80% which was stratified among the age which shows that the success rate was high in the age of less than 30 years. This is mainly because as age increases reproductive functions decreases. This is also supported by previous studies [20,21].

**Conclusion**

Past history of recurrent mid trimester abortions or preterm deliveries when supported by transvaginal ultrasonography forms a reliable basis for diagnosis. Selective use of cervical cerclage had important effect in prolongation of pregnancy and improving fetal survival rate. History alone is not an indication for prophylactic cerclage. Although transvaginal ultrasonography identifies women at risk of preterm delivery but it can not discriminate between different pathologies. Short cervix alone is also not an indication for therapeutic cerclage. Serial transvaginal ultrasound measurement of cervical length in women with risk factors can identify those women truly at high risk of preterm delivery.

We believe cerclage therapy should be considered an ongoing investigational process and recommend an evidence-based approach to identify appropriate treatment for women with sonographic evidence of cervical incompetence.

**References**


