 DOI: 10.18231/2394-2754.2017.0067

Pregnancy outcome after cervical encerclage

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Abstract

Introduction: Cervical encerclage is an obstetric procedure performed for the prevention of prematurity. It was first introduced by shriodkar and McDonalds for women with repeated second trimester losses and cervical changes in current pregnancy.

Objective: To review the pregnancy outcome of patients after cervical encerclage.

Design: This was a retrospective observational study of women underwent cervical encerclage at Sriramachandra Medical College and Research Centre from 2016 to 2017.

Main outcome measures: Pregnancy outcomes include miscarriage, early preterm delivery, late preterm delivery and duration of pregnancy prolonged after encerclage.

Results:

- Overall, 32 patients are involved in this study. Out of 32, four are under follow up.
- Among 28, three (10.7%) pregnancies resulted in miscarriage, only (3.5%) had early preterm deliveries, thirteen (46.42%) had late preterm deliveries, eleven (39.2%) had term deliveries.

Conclusion: In our study, women who had cervical encirclage based on history and when ultrasound showing cervical length <2.5 cm, cervical encerclage beneficial in preventing early preterm births (<34 weeks) and perinatal mortality and morbidity. Rescue encirclage better than expectant management in women with cervical dilation with bulging membranes

Keywords: Cervical encirclage, Pregnancy outcome

Manuscript Received: 16th June, 2017 **Manuscript Accept: 15th July, 2017**

Introduction

Cervical incompetence is defined as the inability to support a pregnancy to term due to a functional or structural defect of the cervix.(1)

Cervical insufficiency is a clinical diagnosis with history of painless cervical dilatation leading to recurrent second trimester pregnancy losses and preterm labor. The incidence of having cervical insufficiency is estimated less than 1% of obstetric population.(2) Cervical insufficiency has been due to several reasons, the acquired causes are dilation and evacuation, loop surgical excision, cold knife and cone biopsy, torn cervix. The congenital causes are in utero diethylstilbestrol exposure, collagen vascular disorders, uterine anomalies. The measurement of cervical length by trans vaginal ultrasound scanning is now common tool in the assessment of the risk of pre term delivery, and for the diagnosis of cervical incompetence.

Cervical cerclage is performed to reduce pregnancy loss/preterm birth in women with cervical insufficiency. The potential patients are

Women with cervical insufficiency based on multiple prior second trimester losses and preterm births are potential candidates for a history indicated cerclage which is past placed at 12-14 weeks gestation to avoid the complication of early spontaneous loss of often attributed to chromosomal abnormalities.(3)

Women with single term pregnancy prior preterm birth and short cervical length (less than 25mm) on transvaginal ultrasound examination at 16 to 23 weeks of gestation are potential candidates of ultrasound indicated cerclage.(4)

Women with cervical insufficiency based on a dilated cervix on a digital speculum examination at 16-25 weeks of gestation are for rescue encerclage. In general, the procedure is not performed before 12 weeks of gestation because most miscarriages due to aneuploidy occur in early and mid-trimester, waiting until end of first trimester also peri natal sonographic evaluation of fetal anomalies and screening and diagnosis of trisomy 21 prior to procedure if indicated; and cerclage is indicated in between 12 weeks to 28 weeks of gestation.

The cerclage removed electively at 37 weeks of gestation or immediately up on onset of labor.(5)

A large trial demonstrated that the incidence of preterm delivery before 34weeks is halved by cervical encerclage, among women with history of three or more preterm deliveries before 37 weeks

Complications associated with cerclage are slipping or rupture of membranes, bleeding, infection, chorioamnionitis, abortion.

In our study rescue cerclage patients had high complication rate like leaking and abortion, bleeding after procedure.

It was shown in a meta-analysis and another study that among women with shortened cervical length, with or without prior pre-term birth, perinatal mortality was significantly reduced by cerclage.

Most cerclages were placed via trans vaginal approach. The trans abdominal approach is more invasive, but allows higher placement since trans abdominal cerclage can be placed at cervico isthmic portion of pelvis, while trans vaginal cerclages often ends up distal to the internal os.

The two most common transvaginal technique for cerclage were described by Shirodkar and McDonald.

McDonald described a suture technique in the form of a purse string that did not require cervical dissection and that was easily placed during pregnancy. Owing to its simplicity and effectiveness, a McDonald technique is recommended as a first line procedure.[6]

In this study McDonald technique used in thirty one women among 32 patients. In the last few years, laproscopic abdominal approach to cervix has been described. Cho and colleagues performed laproscopic abdominal cerclage during study in 20 patient and reported successful fetal outcome in 19 of them.[7]

In our study laproscopic abdominal cerclage applied for one patient out of 32 women in view of cervix was short and torn.

Materials and Method

It is a Retrospective observational study conducted in a tertiary medical center, Sri Ramachandra medical college between 2015to 2016 for one year.

In our study 32 women had cervical cerclage for different indications, of these 7 women with history of two or more second trimester abortions or preterm deliveries, and in 20 patients when ultrasound showing short cervical length that is less than 2.5 cm with or without history of second trimester loss or prior preterm delivery.

In five patients cervical encerclage as rescue.

Cervical cerclage was done during 12^{th} to 26^{th} week of gestation. The participants were studied for the outcome of pregnancy in respect to abortion, and preterm and term deliveries.

Results

32 patients who had cervical encerclage were followed up.

Out of 32, four are continuing their pregnancies, Among 28, Three (10.7%) pregnancies resulted in miscarriage, One (3.57%) had early preterm deliveries, Thirteen (46.42%) had late preterm deliveries, Eleven (39.2%) had term deliveries.

Discussion

Cervical incompetence is characterized by premature, painless cervical dilatation during gestation in the absence of uterine contractions, followed by expulsion of the preterm foetus. Cervical cerclage is an intervention that is widely used to prevent miscarriage or delivery in the second and third trimester.

In our Study (Table 1), among 32 women 21% of them undergone history indicated encerclage, majority of them 62.5% had ultrasound indicated cerclage, for 15.6% of patients Rescue (emergency cerclage) applied.

Table 1: Indication of cervical encerclage

Indication for Cerclage	Number	Percentage
History (n=7)	7	21.8 %
USG Indicated (n=20)	20	62.5%
Rescue(n=5)	5	15.6%

Andrea Liddiard et al study, total of 177 sutures were inserted. Of the 63 patients having sutures beyond 16 weeks, 36 case notes were obtained thus in the remaining 27 cases it was impossible to determine whether the cerclage was ultrasound indicated or rescue in nature. Of the 36 cases available for review, two patients had an (elective) history indicated cervical suture. Twenty-five of the remaining 34 patients (74%) had ultrasound indicated cervical cerclage while nine patients had rescue cervical cerclage.[7]

History indicated Encerclage: Indication is history of increased risk of spontaneous second trimester loss or preterm delivery. Prophylactic measure in asymptomatic women. Inserted electively at 12-14 weeks. In this study, the procedure is performed only after fetal viability and after exclusion of fetal anomalies, nuchal trans lucency, serum biochemical testing. Mc Donald operation was performed in all women identified with history and polypropelene (non absorbable) suture material was used.

Out of 32 patients, 7 patients had history indicated encerclage. All patients were multigravida (Table 2) and patient gestational age range at which encerclage applied at 12-15 weeks in 4 patients and in other 3 patients cerclage was done at 16-23 weeks (Table 3). 6 patients had late preterm delivery that is less than 36 weeks gestational age one patient is in follow up (Table 4). The prolongation of pregnancy in history indicated cerclage is between 14 to 25 weeks (Table 5). Of these women, 4 patients were delivered vaginally and 2 patients had emergency caesarean section.(Table 6)

Table 2: Gravida

Indication for Cerclage	Primigravida	Percentage	Multigravida	Percentage
History (n=7)	0	-	7	100 %
US Indicated(n=20)	7	35%	13	65 %
Rescue(n=5)	1	20 %	4	80 %

Table 3: Gestational age at Cerclage

Indication for Cerclage	12-15 weeks	%	16-23 weeks	%	>23weeks	%
History (n=7)	4	57%	3	42%	0	-
US Indicated (n=20)	5	25%	15	75%	0	
Rescue (n=5)	2	40%	2	40%	1	20%

Table 4: Pregnancy Outcome

Type of cerclage	Term	%	Late preterm	%	Early preterm	%	Abortions	%
History	0	0	6	100%	0	0	0	0
US Indicated	10	58%	5	29.4%	1	5.8%	1	5.8%
Rescue	1	20%	2	40%	0	0	2	40%

Table 5: Prolongation of pregnancy after encerclage

Type of Cerclage	Term (>37 weeks)	Late preterm(34-36+6weeks)	Early Preterm (28-33+6weeks)	Abortion
History	0	14 -25 weeks (6)	0	0
USG Indicated	14-23 weeks (10)	15-23 weeks (5)	9 weeks (1)	10 weeks (1)
Rescue	14 weeks (1)	10-14 weeks (2)	0	2-5 weeks (2)

Table 6: Mode of delivery

Type of Cerclage	Vaginal delivery	%	Elective CESAREAN	%	Emergency cesarean	%
History	4	66.6%	0	0	2	33.3%
USG Indicated	11	64.7%	3	17.6%	2	11.7%
Rescue	3	60%	0	0	0	0

Despite limited evidence to support history indicated circlage, one study performed by Fox and colleagues reported that 75% of (MFM) Maternal Fetal Medicine specially who responded to a survey would place a cerclage in patient with history of prior painless mid gestation loss.[8]

In Andrea Liddiard study there were 116 elective (also described as history indicated) cervical sutures carried out at a mean gestation of 14 weeks. The vast majority of the elective cervical sutures were inserted in multiparous women, with an average age of 31 years. The mean suture to delivery interval was 21 weeks with 76% of patients delivering vaginally at an average gestation of 35 weeks. There were 107 live births, 12 mid-trimester losses and one neonatal death.[9]

USG –Indicated Encerclage

Therapeutic measure in cases of cervical length shortening on TVS.

Performed on asymptomatic women who do not have exposed fetal membranes in the vagina.

TVS: performed between 14 and 24 weeks.

History of one or more spontaneous preterm delivery or STL who have an incidentally identified short cervix of 2.5 cms or less.

In our study Out of 32 patients, 20 patients undergone ultrasound indicated cerclage. Of these 20 women, 7 women were primigravida and 13 women were multigravida.(Table 2) Out of 20 women, 10 patient had term delivery, 5 went into late preterm and 11 patient had early preterm and one patient had abortion(Table 4). The prolongation of pregnancy in 10 patient in range of 14-16 weeks and 5 patients, in range of 15-23 weeks and 1 patient who had early preterm 9 weeks. One patient who had abortion prolonged her pregnancy about 10 weeks after encerclage (Table 5). Of these 20 patient who had ultrasound indicated encerclage, 11 had vaginal delivery 3 patient had elective caesarean and 2 patient undergone emergency caesarean section.(Table 6)

Althuirsues and colleagues in Netherlands randomized high risk patient, the majority of them believed to have CL<25mm. Both with circlage and no circlage, 19 assessed found that in circlage group-No PTB at <34 weeks versus 44% rate in no circlage group.

In our study usage indicated cerclage applied for 20 patients after detecting cervical length by trans vaginal scan, less than 2.5 cm who were identified

during anomaly scan. Among 20 patients 5.8% had abortion, 5.8% early preterm, 29.4%late preterm delivery and 58% of them delivered at term.

Hence cerclage has beneficial in preventing early preterm delivery in women diagnosed to have cervical length less than 2.5cm in ultrasound. Among 20 patients who had USG indicated cerclages, McDonald sutures applied for 19 women and one patient had laproscopic abdominal cerclage.

In a study done by Andrea Liddiard • Sohinee Bhattacharya • Lena Crichton1 et al.[9] There were 25 patients who had a cervical suture inserted on the basis of cervical length scans –this included three sets of twins and one triplet pregnancy. The sonographic cervical length varied between 6 mm and 40 mm (mean 25 mm) and funneling (dilatation of the internal os) was noted on 12 (46%) of the type of suture inserted was poorly documented but there was one modified Shirodkar (high vaginal) suture inserted and 11 McDonald sutures. In these cases, the suture to delivery intervals were 4 and 10 weeks, respectively. Fifteen sutures (60%) were removed in labour. There were two pregnancy losses (8%) at 20–23 weeks gestation. The suture to delivery interval ranged between 1–23 with a mean duration of 10 weeks. The average gestation of delivery was 32 weeks with 54% of patients delivering vaginally.[9]

Rescue (emergency) Cerclage (salvage) cervical cerclage refers to placement of a cerclage in the setting of significant cervical dilatation and/or effacement prior to 28 weeks gestation and in the absence of labor. When the cervix Dilates and the membranes funnel through the internal and external os, the risk of rupture of membranes is high.

Several methods have been described to reduce membranes to place cerclage safely.

Replacement of the prolapsed amniotic sac back into the uterus is usually needed to aid suture placement. This is done by placing patient in trendelen berg position, or by distending urinary bladder with 600 ml of 0.45% saline. This may reduce the prolapsing membranes, it also helps to carry the cervix cephalad away from the operating field. Another method is to place a Foleys catheter in to cervical canal and inflate the bulb with 30ml to displace membranes (Orr technique). Cerclage is usually done by Mc Donald technique and the balloon is deflated gradually as the cerclage suture is tightened around the catheter

In our study group trendelenbreg position and placement of foley catheter in to cervicalcanal, and inflated bulb with 30 ml, membranes bulging pushed up with a sponge on a holder are the methods used to displace membrane while applying suture.

In our study: Out of 32 patients, 5 patients had emergency cerclage of these 5, 1 is primigravida 4 were multigravida(Table 2). Among the 5 women who had rescue encerclage 2 patients suture applied between 12-15 weeks and 2 patients had cerclage between 16-23 weeks and one patient at 26 to 27 weeks(Table 3). Of these 5 patients, one delivered at term and 2 patient had late preterm and 2 had abortion(Table 4) and among the 5 patient who had rescue encerclage in one patient pregnancy prolonged 14 weeks and other 2 patients prolonged between range 10-14 weeks, 2 patient who had abortion-- prolonged between 2days to1week weeks (Table 5) and of the 5 women 3 patients delivered vaginally(Table 6).

In study done by Prasad et al:[5] Out of the 24 patients for whom emergency cervical cerclage was performed, three patients had spontaneous abortion after cervical cerclage, two had PROM and eight of these patients had term delivery. Twenty-one fetus were live born after the period of viability. Nine of these babies were admitted to NICU and 50 percent of the neonates required only regular perinatal care.

In a study, done with the same objectives by Thaher AJ et al in Riyadh, KSA 14 pregnant women underwent emergency cervical cerclage.[10] The average GA at the time of cerclage placement was 23 weeks plus 2 days and the average latency to delivery was 7 weeks and 4 days. In our study the gestational age at the time of presentation ranged from 12 to 26 weeks.

In a study published by L. Pereira et al 225 women were included in the trial, after clinical examination showed cervical incompetence.[11] 152 underwent emergency cerclage and 73 were managed expectantly without cerclage. Compared with expectant management, cerclage group was associated with longer latency of gestational age at delivery, improved neonatal survival, birth weight greater than 1.5 kg.

In our study urgent (Rescue) cerclage applied in 5 patients 20% had term spontaneous vaginal delivery, 40% had late preterm delivery, 40% had miscarriage.

Hence rescue cerclage has a definite role when cervical dilatation and bulging membranes complicate the pregnancy.

Conclusion

In our study, women who had cervical encirclage based on history and when ultrasound showing cervical length <2.5 cm, cervical encerclage was beneficial in preventing early preterm births (<34 weeks) and peri natal mortality and morbidity. Rescue encirclage better than expectant management in women with cervical dilation with bulging membranes.

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