

Research Article

Outcome of emergency cerclage for advanced cervical dilatation: a retrospective analysis

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ABSTRACT

Background: The objective was to evaluate the outcome of late second trimester emergency cerclage in patients with advanced cervical dilatation with bulging membranes.

Methods: Setting: department of obstetrics and gynaecology, PSG Institute of medical sciences & research, Coimbatore, Tamil Nadu, India. This is a retrospective study of case files of patients who underwent emergency late second trimester cerclage for advanced cervical dilatation with bulging membranes between January 2009 to January 2014. McDonald's technique was used in all the cases.

Results: Altogether, 7 patients (100%) underwent late second trimester emergency cerclage between 20-28 weeks of gestational age, out of which three patients (42.86%) had term deliveries (>37w), and 3 patients (42.86%) carried on their pregnancies to more than 32 weeks resulting in healthy live born babies. Two of them delivered by normal vaginal delivery, 4 underwent LSCS, and one patient had severe abdominal pain with bleeding and draining per vaginum after 3 days of cerclage, in view of which the stitch was removed. Subsequently, the patient expelled a live foetus weighing 620gms, which died in the Neonatal Intensive Care Unit (NICU) after 3 hours. This procedure prolonged the duration of pregnancy in all patients with a mean duration of 70.4 days. The mean gestational age at the time of delivery was 34.33 weeks. The mean birth weight was 2.18 kg and ranged between 1.97 to 2.64 kg. The mean APGAR at one minute was 8/10 and the mean duration of stay in NICU was 1.66 days. All the new-born babies were healthy at the time of discharge. The live birth rate following emergency late second trimester cerclage in this series was 85.75%.

Conclusion: Favourable neonatal outcome can be accomplished in patients with cervical incompetence in the second trimester of pregnancy following emergency cervical suturing, even if performed when the membranes are bulging through the cervix.

Keywords: Late second trimester, Bulging membranes, Emergency cerclage, Pregnancy outcomes

INTRODUCTION

Cervical insufficiency is a well-known cause of second trimester pregnancy loss and is defined as the failure of the cervix to retain the foetus in utero till term due to a functional or structural defect of the cervix.¹ It is characterized by painless dilatation and effacement of the cervix, usually in the second trimester of the pregnancy, leading to bulging of foetal membranes through the

uterine cervix and vagina, and, in severe cases through the external genitalia with resultant premature rupture of membranes and often, a pre-viable delivery.² It has been estimated that cervical incompetence is responsible for 0.1-0.2% of all spontaneous abortions, contributes to 16-20% of all second trimester pregnancy losses,³ 8-15% among women with prior history of recurrent spontaneous abortions⁴ and 10% of preterm deliveries.⁵ Cervical cerclage has been a common practice in obstetrics ever since it was first described by Shirodkar,

and then McDonald in the 1950's. Indications for cerclage placement have included the patient's obstetric history, ultrasound findings, physical examination, or a combination of both. However most of the larger and randomized trials studying the effectiveness of cerclage were done for patients with a history of prior pregnancy loss or preterm birth (history-indicated cerclage)^{6,7} or for the indication of a short cervix on ultrasound (ultrasound-indicated cerclage).^{8,9}

Emergency cervical cerclage refers to the placement of a cerclage in the setting of significant cervical dilatation, and/or effacement with prolapsed or bulging membranes prior to 28 weeks of gestation in the absence of labour. ACOG supports the placement of a cervical cerclage up to 28 weeks of gestation.¹⁰ However, many practitioners would not recommend emergency cervical cerclage beyond the period of foetal viability (i.e. ≥ 24 weeks gestation), because the potential harm likely outweighs the potential benefit.¹¹ The most challenging presentation of cervical incompetence, the woman with prolapsed membranes at or beyond a dilated cervical os has never been a subject of randomized trial. The published studies are either prospective on a small number of patients, or retrospective. Although these studies suggest that emergency cerclage is associated with prolonged gestation and reduced risk of preterm birth, due to certain limitations in these studies, the management of these patients remains controversial.

The objective of this study was to describe our experience with emergency cerclage in patients presenting with advanced cervical dilatation with bulging membranes in late second trimester, and to analyse the pregnancy and neonatal outcomes following the same.

METHODS

This was a retrospective observational study carried out in the department of obstetrics and gynaecology, PSGIMS&R hospitals, Coimbatore, Tamil Nadu, India, between January 2009 and January 2014. All women who underwent emergency cerclage in the late second trimester (between 20-28 weeks) were included. We defined an emergency cerclage as a cerclage required when the membranes were bulging at or beyond the external os, with advanced cervical effacement and dilatation.

The procedure was only performed where evidence of infection or labour were absent. Infection was excluded clinically, by a collective absence of pyrexia, uterine tenderness, and high white blood cell count. High vaginal and cervical swabs were taken for microbiological culture and sensitivity. Since patients were asymptomatic, we did not wait for final culture results before proceeding with the cerclage placement. Women with active contractions, twin pregnancy, premature rupture of membranes, clinical signs of chorioamnionitis, vaginal bleeding, or an anomalous foetus, were excluded.

Case files of patients treated during the study period were analysed. Data extracted included patient demographics, clinical characteristics, gestational age at suture insertion, gestational age at delivery, mode of delivery and initial pregnancy outcomes including Apgar score at 1st and 5th minute, NICU admission, and birth weight. A good outcome was defined as delivery after 32 weeks with a healthy mother and child at discharge. The main outcome measures analysed were gestational age at delivery, live birth rate, and birth weight.

Technique

After proper counselling, written and informed consent was obtained. The patient was given broad-spectrum antibiotic prophylaxis inj. cefazolin, 1 g intravenous before or during the procedure, and continued orally for 5 days. Tocolysis with nifedipine retard and intramuscular hydroxyprogesterone caproate 500 mg were also given prior to the procedure.

During the procedure, patients were placed in lithotomy position with a steep Trendelenberg tilt. General anaesthesia was used for all cases to get adequate uterine relaxation. The vulva, vagina were cleaned with aseptic solution, and the bladder emptied. Using Sim's speculum for exposure, the edges of the cervix were identified with difficulty, and grasped with sponge holding forceps.

An attempt was made to push the bulging membranes into the uterus with a Foley's catheter inflated with 30 ml of water, as described by Holman¹² and Sher.¹³ Gentle pressure is used to replace the membranes, and cerclage was carried out using McDonald's technique with Merselene tape/umbilical tape (or) No 1 prolene. The knot is then tied at six O'clock position.

Post-operatively, nifedipine retard tocolysis was continued for one week and the patients were discharged after 72 hours of the procedure. On discharge, instructions given to lead a quiet life, avoid intercourse, and attend the antenatal clinic for assessment after two weeks. Additionally, all these patients received intramuscular hydroxyprogesterone caproate, which acts as a uterine relaxant, weekly until 34 weeks.

RESULTS

Altogether, seven patients were analysed during the study period. The demographic and maternal characteristics were shown in Table 1. Majority were primigravidas (57.14%) and their average age was 23.3 years (Range 20-26 years) while their gestational age at the time of cerclage ranged between 22 and 26 weeks. The mean gestational age was 24.1 weeks. There was no difference in the socio economic status of these patients. In our study 42.86% of patients had merselene tape, 28.6% had umbilical tape and another 28.6% had prolene. None of the patients had growth in the vaginal swabs that were taken prior to the procedure.

Table 1: Demographic and maternal characteristics.

Variables	n=7	Percentage
Age (years)		
Mean	23.29	
Range	20-26	
Parity		
Primi	4	57.14
Multi	3	42.86
Gestational age at cerclage		
Mean	24.14	
Range	22-26	
Type of stitch		
Merselene tape	3	42.86
Umbilical tape	2	28.57
Prolene	2	28.57

Among the seven patients who underwent emergency cerclage, three (42.86%) patients had term deliveries, another three (42.86%) patients carried their pregnancy to >32 weeks. One (14.28%) patient had a spontaneous abortion. She was a primi with a history of spotting per vaginam on and off, who came with pain abdomen at 23 weeks. On examination, she had a dilated os of 2-3 cm with bulging membranes. She underwent encerclage on the same day. After 72 hours of cerclage, her uterine contractions started, and she had bleeding and draining per vaginam. The stitch was undone, and she expelled a live 620 gm male foetus that died in NICU after 3 hours of admission. The time interval between the insertion of cervical stitch and delivery ranged between 3 and 98 days, mean duration being 70.4 days. The mean gestational age at the time of delivery was 34.33 weeks and ranged between 23 weeks + 4 days to 38 weeks + 4 days. Overall, there were six live births and the live birth rate was 85.72%, of which two had normal vaginal delivery with spontaneous labour onset and the remaining four patients underwent LSCS for obstetric indications.

Fetal outcomes are presented in Table 3.

Table 2: Pregnancy outcomes.

Variables	n=7	Percentage
Pregnancy prolongation in days		
Mean	70.4	
Range	3-98	
Gestational age at delivery in weeks		
mean	34.33	
range	23-38	
Abortion	1	14.28
Term delivery (>37 weeks)	3	42.86
Preterm delivery (>32weeks)	3	42.86
Live birth	6	85.72
Mode of delivery		
Normal delivery	2	33.33%
Emergency LSCS	2	33.33%
Elective LSCS	2	33.33%

Table 3: Fetal outcomes.

Variables	n=6
Admission in NICU	
	3
Birth weight in kg	
<2kg	1
2-2.5 kg	4
>2.5kg	1
Mean	2.18
range	1.97-2.64
Mean APGAR	
At 1 st minute	8/10
At 5 th minute	9/10
Duration of stay in NICU (in days)	
Mean	1.66
Range	1 - 5

Table 4: Detailed description of each patient and outcome.

Obs. history	Complaints	Diagnosis & findings on admission	GA at encerclage Type of cerclage and suture	Pregnancy Prolongation in days	GA at delivery Mode of delivery	Birth wt & APGAR (1 st and 5 th minute)	Admission in NICU	Comments
24 year old primi	H/O bleeding PV with abdominal pain	Per speculu, os 3 cm, rim of cervix seen, membranes bulging through cervix	At 24 weeks, McDonald's method umbilical tape, knot placed posterior.	98 days (14 weeks)	38 weeks + 4 days emergency LSCS indication: grade 3 meconium	2.08 kg, 8/10, 9/10	Yes, shifted to mother's side after 20 hours of life	Known hypothyroidism, on Eltroxin 25mcg Developed mild pre-eclampsia from 36 weeks, hence induction done at 38 weeks
26 year old G2P1L1, G1 emergency LSCS at term, male baby, 6	Asymptomatic	By USG, at 26 weeks showed U shaped funnelling,	At 26 weeks, McDonald's, Merselene tape, knot posterior	84 days (12 weeks)	37 weeks + 5 days Elective LSCS and cerclage	2.64 kg, 8/10, 9/10	No	Known hypothyroidism, on eltroxin 75 mcg

years, healthy G2 - present pregnancy		internal os opened. P/S; membranes bulging, cervical rim not seen			removal indication: previous LSCS with CPD			
25 year old Primi	Abdominal pain at 23 weeks plus 1 day h/o spotting PV from 12 weeks, was on proluton	Per speculum: , cervix not seen, membranes bulging through os	At 23 weeks and 1 day, McDonald's, prolene, posterior knot	3 days	23 weeks + 4 days Spontaneous abortion at 23 weeks + 4 days	620 gm live male baby, which died after 3 hours in the NICU		Patient developed intermittent abdominal pain and bleeding & draining PV 72 hours after enceclage, hence, cervical stitch removed, and she expelled
20 year old Primi	Came with white discharge PV at 24 weeks	p/s; os 3- 4cm, bom bulging, cervical rim seen with difficulty	24 weeks+1day Mc Donald's, Merselene tape, posterior knot	14 weeks (98 days)	8 weeks + 1 day Elective LSCS with cerclage removal ind: breech	2.19 kg, 8/10,9/10	No	Known epileptic on levipill, developed gestational HT at term
21 year old G2P1L0 - G1 - preterm delivery at 28weeks,900gm s,died after 2 hours G2 - present pregnancy	Came with vague lower abdominal pain for 2 days	Per speculum: Os 3 cm, membranes bulging, minimal cervical rim seen.	26 weeks + 1 day Mc Donald's, umbilical tape posterior	9 weeks (63 days)	35 weeks Normal vaginal delivery	2.2kg 8/10,9/10	NICU admission 1 day	at 35 weeks, came in active labour cx 4-5 cm, hence cervical stitch removed
22 year old Primi	Asymptomatic diagnosed during routine target scan	Diagnosed by USG - internal os widely opened with amniotic sac with cord, no residual cervix. Per speculum - well effaced, membranes bulging through os rim of cervix not seen.	24 weeks Mc Donald's, with no 1 prolene, knot posterior	10 weeks	34 weeks forceps vaginal delivery indication: fetal distress with cord prolapse	2.02 kg 8/10,9/10	NICU admission for preterm low birth weight, neonatal jaundice, stay 5 days NICU	At 34 weeks Came in active labour, p/v - well effaced, 3-4 cm, BOM+, one dose of Betamethasone given and cervical stitch removed. Had PPH, one unit of packed cell given
25 year old G3P1L1A1- G1-spontaneous abortion at 2 months, G2- cervical incompetence diagnosed and enceclage done at 27 weeks for short cervix had PPROM at 33 weeks with breech, LSCS done. G3-Present pregnancy	Came with lower abdominal pain	P/s; well effaced, membranes bulging into the vagina, rim of cervix not seen	22 weeks, McDonald's, Merselene tape, knot posterior	11 weeks (77 days)	33weeks + 2 days emergency LSCS With enceclage removal indication: previous LSCS, breech with PPROM	1.97 kg 8/10,9/10	Admission 3 days for preterm and neonatal jaundice	GDM on diet. History of threatened preterm pain at 27&31 weeks, .had PPROM at 33weeks+2days, cervix 3-4cms, membranes absent, clear liquor. Intra- op scar dehiscence present.

Out of six live born, three were in NICU for low birth weight. The mean birth weight was 2.18 kg and ranged between 1.97 to 2.64 kg. The mean APGAR at one minute was 8/10 and the mean duration of stay in NICU was 1.66 days and ranged between 1 to 5 days. All six newborn babies were healthy at the time of discharge. The live birth rate following emergency late second trimester cerclage in this series was 85.75%.

The details of each patient including patient history, cerclage type, gestational age, and outcomes are described in Table 4.

DISCUSSION

Cervical cerclage is an intervention that is widely used to prevent miscarriage or delivery in the second trimester of pregnancy. It has been referred to as heroic cerclage or rescue cerclage in cases with advanced cervical dilatation and bulging membranes due to its poor success rate.¹⁴

Emergency cervical cerclage in advanced cervical dilatation with bulging membranes in the second trimester remains a controversial decision. The responsible obstetrician and the patient who presents with painless dilatation either have to wait for further events or to undertake a procedure that by itself carries its own risk of rupturing the membranes and thus ending the pregnancy. The outcome of these pregnancies is usually poor, but without a cerclage the loss of pregnancy is inevitable, reported survival rate following emergency cerclage varies from 12.5 % to 63 % in woman with advanced cervical dilatation.¹¹

Groom et al., 2001, showed a successful pregnancy outcome following emergency cerclage in a woman with advanced cervical dilatation in second trimester.¹⁵ Ventolini et al., 2009, presented retrospective cohort study of women who experienced late mid-trimester cervical dilatation, of 68 women. 56 women had rescue cerclage and 12 women underwent expectant management. Median time from diagnosis to delivery was longer in this cerclage group (9.1 weeks more than in the expectant group, which was 3.3 weeks; $P < 0.01$). They concluded that cerclage was a better option in appropriately selected cases.¹⁶ Kanai et al., 2008, presented 5 cases of bulging membranes that were all replaced in the uterine cavity using a balloon and mean prolongation of pregnancy was 77.6 days.¹⁷ Such prolongation was well achieved in our series, with a mean pregnancy prolongation of 70.4 days.

Cockwell et al., 2005, presented 12 cases of emergency cerclage in which the mean prolongation of pregnancy was 7 weeks and one day, with a neonatal survival of over 70%.¹⁸ Thomas Obinchemti Egbe et al., 2013, presented 6 cases of emergency cerclage done for advanced cervical dilatation with bulging amniotic membranes between 24 to 26 weeks of gestational age in

that four cases (66.7 %) carried on their pregnancies to term, and resulted in healthy live born babies.¹⁹ Matijewic et al., reported 66% of fetal survival in pregnancies with cervical dilatation and bulging membranes.²⁰ In our series, a live birth rate of 85.72 % was observed and all live born babies were healthy at the time of discharge.

The underlying subclinical infection can't be excluded in one case that ended up in abortion who had increased WBC count prior to the cerclage. Purnima et al., 2011, evaluated a retrospective analysis of 20 cases of emergency cerclage, which reveals a significant association between initial white cell count and perinatal outcome. This information is helpful in decision making and counselling the patients regarding likely outcome.²¹ If silent membrane prolapsed to or past the external os occurs at 22 weeks or before, the incidence of intrauterine bacterial colonization is 20% to 50% as reported by Romero et al., 1992.²² By replacing the membranes and closing the cervix, the risk of exposure to vaginal infection is reduced. Therefore, the inflammatory-like process, which is responsible for cervical ripening and onset of contraction, is also reduced. This causes the cervix to close, lengthen, and prolong the pregnancy.

The studies presented conclude that emergency cervical cerclage is indeed a viable therapeutic option in appropriately selected cases. However, the rather encouraging results of the present study cannot be solely attributed to the surgical procedure per se, which has basically remained unchanged in the past decades, the treatment of the neonates that has changed dramatically over the years may also contribute to their success. Randomised controlled trials must be conducted in order to analyze if emergency rescue cerclage has its benefits. In the meantime, emergency cerclage should be used judiciously and only after extensive and comprehensive patient counselling and proper selection of cases for a successful outcome.

CONCLUSION

The results of the present study demonstrated a favourable prolongation of pregnancy and neonatal outcome in emergency second trimester cerclage, even when bulging of the membranes exist. It seems the current standard of neonatal treatment coupled with a very prudent and meticulous surgical technique of emergency placement of a cervical suture justifies the performance of a cerclage in these patients. The limitation of the study is that the study population is too small to draw meaningful conclusion of statistical significance. Therefore, a multi centric study becomes imperative.

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