Emergency cervical cerclage

Does the gestational age make a difference?

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ABSTRACT

Objective: To investigate the effectiveness of emergency cervical cerclage in prolongation of pregnancy and its effect on pregnancy outcome in patients with cervical incompetence.

Methods: A retrospective review of patients who had an emergency cervical cerclage performed for cervical incompetence during the period from July 1995 to June 2002 was carried out in Abha General Hospital, Abha, Kingdom of Saudi Arabia. Twenty patients between 16 and 26 weeks of gestation with 1) cervical effacement, 2) cervical dilatation of $\leq$3 cm, 3) herniation of intact fetal membranes through the cervical os, 4) absence of established labor, and 5) absence of clinical evidence of infection were studied. The duration of cerclage in situ, gestation at delivery and birth weight were analyzed.

Results: The mean duration of cerclage in situ was 68.5 days. The mean gestation at delivery was 30.5 weeks and the mean birth weight was 1844 grams. The duration of cerclage in situ was significantly longer when the procedure was performed at or before 22 weeks of gestation with a p value of <0.02 (Mann-Whitney U test), but the difference in the gestation at delivery and birth weight was not significant. There was also a significant negative correlation between the gestation at cerclage and the duration of cerclage in situ (Spearman's correlation coefficient r_s = -0.56, p<0.05).

Conclusion: Emergency cervical cerclage in early second trimester effectively prolonged pregnancy compared to emergency cerclage performed in late second trimester.

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Recurrent second trimester pregnancy loss is a very distressing problem, and one of the causes is thought to be cervical incompetence. Cervical incompetence is defined as the inability of the cervix to maintain a pregnancy until term,[1,2] this could be due to structural or functional defect in the cervix. Cervical incompetence is one of the important causes of habitual miscarriage in the second trimester of pregnancy. The precise incidence of cervical incompetence is unknown; however, 0.05-1% of all pregnancies have been suggested.[3,4] This phenomenon is said to account for 0.2% of all miscarriages and 16-20% of those in the second trimester. Among women with a history of habitual miscarriage, the incidence of cervical incompetence is approximately 12%. Cervical incompetence causes preterm delivery and carries significant neonatal mortality and morbidity. Cervical cerclage has been advocated both as a treatment and prophylaxis for cervical incompetence.[5,6] Results from the Medical Research Council/Royal College of Obstetricians and Gynecologists Report[7] have shown that elective cervical cerclage had an important beneficial effect

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in one out of 25 cases with fewer deliveries before 33 weeks of gestation in the cerclage group. Most cervical cerclages have been performed electively, which become the standard therapy for cervical incompetence. These elective cervical cerclages are usually performed on the premises of pervious history of cervical incompetence, and before the evidence of cervical changes in the index pregnancy, whereas emergency cerclage is performed less commonly than elective cerclage.[7,8] The aim of this study is to investigate the outcome of emergency cerclage performed on patients with evidence of cervical changes or herniation of fetal membranes and to identify any positive factor towards favorable fetal outcome.

Methods. This was a retrospective review carried out in Abha General Hospital (July 1995 to June 2002) for patients who received an emergency cervical cerclage at gestation between 16 and 26 weeks. Twenty patients received an emergency cervical cerclage for evidence of cervical incompetence where approximately 6000 deliveries performed per year. Evidence of cervical incompetence included: 1) cervical effacement, 2) cervical dilatation of 3cm or less, 3) herniation of intact fetal membranes through the cervical os, 4) absence of established labor, and 5) absence of clinical evidence of infection.

All cases were singleton pregnancies, which were conceived naturally. Eight patients were nulliparous and 12 were multiparous. Seven had a history of cervical incompetence but only 5 had a history of pervious cervical cerclage. Eight patients had a history of dilatation and curettage for first trimester miscarriages. The presenting symptoms for present episode of cervical incompetence included: mucoid vaginal discharge in 11 patients and 9 patients were a symptomatic and the diagnosis of cervical incompetence was made after a speculum examination for cervical smear, which was a routine procedure for all antenatal patients during the first visit.

Cerclage techniques. All our patients had a McDonald cerclage. All cerclage procedures were performed in the operating theater under general anesthesia. After induction of anesthesia, the patient was put in a deep Trendelenburg position. A high vaginal swab was taken for bacteriology culture in all patients before the disinfection procedure. The vulva and vagina were then disinfected with 5% aqueous chlorhexidine gluconate solution. The disinfection procedure of the vagina was omitted in 8 cases where the fetal membranes had herniated; in order to avoid inadvertent rupture of the membranes. After the cervix had been exposed using vaginal wall retractors, the anterior and posterior cervical lips were grasped with Rampley sponge holding forceps. Gentle traction on the forceps and the deep Trendelenburg position most often cause the herniated fetal membranes to fall back into the uterine cavity. In case when the membranes did not fall back, a Foley catheter was inserted in the cervix with its balloon filled with water until the membranes were pushed back into the uterine cavity. A cervical suture using 5 mm Mersilene tape (Ethicon RS-21, Ethicon Inc, Somerville, New Jersey, USA) with a blunt-tip large needle was performed as described by McDonald.[6]

All our patients received Indomethacin rectal suppositories 100 mg twice daily as tocolysis and prophylactic intravenous broad-spectrum antibiotics for 48 hours after cerclage. The patients were seen at fortnightly intervals for routine antenatal examinations. Cerclage sutures were removed electively at the gestation of 37 weeks, or whenever labor or rupture of fetal membranes was diagnosed.

Statistical analysis. Mann-Whitney U test and Spearman's correlation were used to analyze the relationship between the gestation at cerclage and 3 clinical outcome parameters. The 3 parameters were duration of cerclage in situ, gestation at delivery, and the birth weight. The duration of cerclage in situ was defined as the period in term of days from the insertion until the removal of the cerclage.

Results. The results of 20 patients with emergency cerclage are shown in **Table 1**. There were no operative or anesthetic complications during cerclage procedure. The mean duration of cerclage in situ was 68.5 days. The mean gestation at delivery was 30.5 weeks. The mean birth weight was 1844 gm. Five patients (25%) had spontaneous onset of labor at term after elective removal of cerclage at 37 weeks of gestation and 12 patients (60%) had preterm delivery. Three patients (15%) had miscarriages shortly after the cerclage. Five out of 20 patients had a positive high vaginal culture taken at the time of the cerclage insertion (**Table 1**). Anti fungal treatments were prescribed to treat the *Candidiasis* and the *Staphylococcal* infection was treated with ampicillin.

Two patients had a cesarean delivery. One patient had a cerclage removed electively at 37 weeks of gestation, a week later she went into spontaneous labor. Cesarean section was performed for suspected fetal distress presented with intrapartum abnormal fetal heart tracing, and a normal 2750 gm baby was delivered. The other patient had a spontaneous onset of labor at 28 weeks of gestation, which failed to respond to ritodrine tocolysis. The fetus was found to be in breech presentation. Emergency cesarean section was performed and delivered a 1300 gm baby.

After subdividing the patients according to their gestational age at the time of cerclage, there was no significant difference in the duration of cerclage in situ, gestation at delivery, and birth weight with all gestational sub-groups except for 22 weeks gestation. The duration of cerclage in situ was found to be significantly longer when the cerclage was performed at or before 22 weeks than it was performed after 22 weeks of gestation. However, there was no difference in the gestation at delivery and birth weight between the 2 sub groups. There was also a significant negative correlation between the gestation at cerclage and the duration of cerclage in situ (Spearman's correlation coefficient r_s =-0.56, $p<0.05$).

Discussion. We confirmed that cervical cerclage is technically possible despite the dilatation of the cervical os. No inadvertent rupture of the membranes occurred. Being simple and one of the most common cerclage techniques, all our patients had McDonald cerclage. Some obstetricians preferred the Wurm cerclage[9] since monofilament suture material was employed, which had reported lower incidence of post cerclage chorioamnionitis than polyfilament mercilene.[10] We did not have the impression that McDonald cerclage using Mersilene tape had a high incidence of infection than the Wurm cerclage using a nylon suture. Infection as a major complication of cervical cerclage had been reported in several studies.[11,12] Focal infection of the exposed fetal membranes by the resident cervicovaginal bacterial flora, with possible enhancement by the cerclage suture acting as a foreign body has been postulated as the cause of infection, However, 8 of our cases in our series had forewater herniation (**Table 1**) but the incidence of vaginal infection and spontaneous rupture of membranes were not significantly higher than the patients without forewater herniation. From our study, it has been shown that emergency cerclage did not prevent preterm delivery but nevertheless the duration of pregnancy was prolonged by the cerclage. This agrees with pervious studies.[13] Although our results showed that emergency cerclages performed at or before 22 weeks of gestation had significantly prolonged pregnancy than those performed after 22 weeks, we believe there is still a clinical role for emergency cerclages between 22 weeks and 26 weeks of gestation. There

Table 1 - Clinical details of patients who had an emergency cervical cerclage.

Patient number	Age (years)	Parity	Cervical dilatation (cm)	Herniation of forewater	HVS at cerclage	Gestation at cerclage (weeks:days)	Duration of cerclage in situ (days)	Gestation at delivery (weeks:days)	Mode of Delivery	Neonatal outcome (gm)
1	25	0	3	Yes	*C. albicanis*	24:5	80	36:2	SVD	LB2900
2	21	0	2	No	*C. albicanis*	22:3	110	38:0	SVD	LB3200
3	24	1	3	Yes	Normal	25:6	81	37:1	SVD	LB3450
4	35	2	1	No	Normal	18:3	3	18:6	A	400
5	27	0	1	No	Normal	16:1	122	33:5	SVD	LB1700
6	32	3	1	No	Normal	20:3	110	36	SVD	LB2300
7	30	1	2	No	*C.albicanis*	16:5	143	37:1	SVD	LB2950
8	37	4	3	Yes	Normal	24:6	87	38:0	CS	LB2750
9	38	3	2	Yes	*Staph. aurus*	23:5	50	30:6	SVD	LB2050
10	23	2	2	Yes	Normal	18:2	140	38:2	SVD	LB3400
11	24	0	2	No	Normal	17:6	1	18:0	A	350
12	28	0	3	No	Normal	23:4	65	32:6	SVD	LB1300
13	36	2	1	No	Normal	20:5	66	30:1	SVD	LB1700
14	33	3	2	Yes	Normal	19:1	2	19:3	A	450
15	32	1	1	No	*C.albicanis*	17:3	77	28:3	CS	LB1300
16	37	0	3	Yes	Normal	16:5	42	25:5	SVD	LB950
17	24	1	2	No	Normal	18:2	48	25:1	SVD	LB920
18	29	0	1	No	Normal	21:3	28	25:3	SVD	LB1100
19	30	1	3	Yes	Normal	24:6	15	27:0	SVD	LB1400
20	33	0	1	No	Normal	16:3	100	30:5	SVD	LB1800

SVD - spontaneous vaginal delivery, CS - cesarean section, A - abortion, LB - live birth, HVS - high vaginal swab,
C. albicanis - *Candida albicanis, Staph. aurus* - *Staphylococcus aurus*

is no doubt that this extra time gained would contribute to the improved survival rate and status of such premature neonates since gestational age is one factor which strongly associates with neonatal survival. The extra time gained would also allow steroid to be administered to accelerate fetal lung maturity.

Under such circumstances, one has to balance between the maternal risks subjected to the general anesthesia, the procedure, tocolytic prophylaxis in the postoperative period and the neonatal risks in delivered prematurely. The overall neonatal survival rate is 70-80% between 26-28 weeks gestation; the intact survival rate is much lower. The incidences of intraventricular hemorrhage and narcotizing enterocolitis in preterm delivery with residual long-term deleterious effects are high. By prolonging the pregnancy by cerclage for steroid to be administered may reduce the neonatal incidences of persistent ducts arteriosus, intraventricular hemorrhage, narcotizing enterocolitis, and bronchopulmonary dysplasia.[14,15] Therefore, emergency cerclage at such late stage may still have a positive role to defer delivery, to administer steroid and to minimize associated neonatal risks.

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