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Effectiveness of Cervical Cerclage in Women with Cervical Incompetence

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Abstract

Background: **To evaluate the effectiveness of cervical cerclage in cervical incompetence**

Methods: **This prospective observational study included a total of 46 women with single alive gestation at 14 to 24 weeks. They either had previous history suggestive of cervical incompetence or cervical changes associated with cervical incompetence as found on transabdominal scan. McDonald cervical cerclage was placed around the cervix between 14 – 24 weeks of gestation.**

Results: **Term delivery rate was 95.4 %. Preterm delivery rate before 34 weeks of gestation was 4.6 % and the mean gestational age at delivery was 35 weeks with mean prolongation of delivery interval 28 weeks after the application of cerclage. The mean birth weight was 2800 grams. Neonatal survival was 96% and neonatal morbidity was 4 %.**

Conclusion: **Our results effectively prove the effectiveness of cervical cerclage in cervical incompetence.**

Key Words: **Cervical incompetence, cervical cerclage, neonatal survival, preterm birth.**

Introduction

In pregnancy, cervix remains closed until term, when complex interactions of hormones and uterine contractions cause it to dilate and efface. Cervical incompetence is defined as the weakness of the sphincter mechanism of the internal cervical os leading to painless effacement and dilatation of the cervix. This results in either midtrimester pregnancy loss or pre term rupture of membranes or preterm labor and pregnancy failure[1]. It affects 1-2% of all pregnancies.

Cervical incompetence is largely a clinical diagnosis. Features suggestive of the condition may be detected in the history or per speculum examination. These are painless dilatation and effacement of cervix resulting in midtrimester expulsion of fetus or premature preterm rupture of membranes (PPROM) or preterm labour, a bearing down sensation or feeling of lump in vagina. On speculum examination visualization of bulging fetal membranes through partially dilated cervix confirms diagnosis. Recently, ultrasonographic findings of the lower uterine segment have been found to be associated with cervical incompetence[2]. These findings include dilatation of the internal os, prolapse of the fetal membranes into the endocervical canal, shortened cervical length or the presence of fetal parts in the cervix or vagina. These findings during the second trimester have become synonymous with cervical incompetence[2,3].

Shirodkar introduced the application of transvaginal cervical cerclage as treatment of cervical incompetence in 1951[4]. Initially the operation was performed during pregnancy after the detection of a gradually yielding cervix seen in a woman who had entered seventh month of pregnancy. MacDonald introduced his transvaginal cervical cerclage in 1957[5]. McDonald cervical cerclage was performed when dilatation of cervix and bulging fetal membranes were present during the second trimester of pregnancy. Several observational studies into the efficacy of cervical cerclage have claimed high rate of successful pregnancy outcome in women with a poor obstetric history attributed to cervical incompetence[6,7]. However, a recent aggregate data on Cochrane review found no such conclusive evidence from seven randomized controlled trials[8]. Current data suggests that cervical cerclage is likely to benefit women considered to be at very high risk of a second trimester miscarriage due to a cervical factor. However identifying such factors remains elusive and many women may be treated unnecessarily[9].

There is limited information on this subject in Pakistan. Two studies are available so far showing marked improvement in the pregnancy salvage rate and fetal outcome after application of cervical cerclage[10,11].

This study was conducted at DHQ Hospital Rawalpindi from March 2005 to December 2007. The purpose of the study was to evaluate the outcome of pregnancy after application of McDonald cervical

cerclage in high risk cases in our set up.

Patients and Methods

All 46 women with single alive fetuses at 14-24 weeks of gestation with previous obstetrical/ gynaecological history suggestive of cervical incompetence were recruited into the study from, March 2005 to December 2007. They had come with previous history of mid-trimester pregnancy losses, premature preterm rupture of membranes or preterm birth associated with painless dilatation and effacement of cervix and pregnancy loss. Also included were the women with already diagnosed cervical incompetence through hysterosalpingography, or by passing Hegars Dilator No.6 in non pregnant state.

The women with previous history of cone biopsy of cervix, loop excision, laser vaporization procedure or documented uterine anomaly. were also included. Women with previous history of missed abortions or idiopathic abortions or those with anti phospholipid syndrome were not included.

All the patients who met inclusion criteria were hospitalized. Informed written consent was taken. Base line investigation i.e. blood grouping, urine examination, blood CP,random blood sugar and viral serology were done. VDRL, rubella antibodies, and toxoplasmosis antibody were also done. Obstetrical ultrasound was performed with full bladder transabdominally.

All the patients had four measurements in centimeters (1) Width of dilatation of the internal os (2) depth of membrane prolapsed into the endocervical canal (3) distal cervical length (4) total cervical length. All the women with demonstrable prolapse of fetal membranes into the endocervical canal >25 % of the total cervical length or distal cervical length of <2.5 cm according to trans-abdominal scan were recruited. Other exclusion criteria were membrane prolapse beyond the external os, any other lethal fetal abnormality, clinical evidence of abruption placenta, unexplained vaginal bleeding, chorioamnionitis, uterine activity and cervical change consistent with inevitable miscarriage.

HVS for culture and sensitivity was also taken. All the patients were treated as inpatients with bed rest and were given infusion erythromycin 500mg thrice daily for 48 hours and injection Proluton depot intra muscular twice weekly .

The anaesthesia used was intravenous or general anaesthesia. The patients were placed in lithotomy position. After scrubbing and drabbing the operation field, an encircling suture was placed around the cervix at the level of the internal os with silk no. 1 suture using round bodied needle similar to the technique of McDonald cerclage.

Women were restricted to bed for the first 24 hours. They were mobilized next day and discharged from the hospital on third day. Prophylactic antibiotics, tocolytics, steroids and home uterine monitoring were not used. Cervical length was measured once a week serially till 32 weeks. Cerclage was removed electively at 37 weeks of gestation or in emergency when patient came in labour or premature preterm rupture of membranes or abruption. At home, the patients were instructed to avoid all unnecessary activity and to maintain the lateral recumbent position as much as possible.

Variables analyzed included maternal demographic characteristics i.e. age, previous gynaecological and obstetrical history. Primary outcome measure was the term delivery rate. Others were preterm delivery rate before 34 weeks of gestation and mean prolongation of gestation after application of cervical cerclage. Intra operative and post operative complications of the procedure were also analyzed.

Mean birth weight and neonatal morbidity and perinatal death were also noted. Neonatal morbidity was defined as admission to NICU. Perinatal death was defined as death of live born babies during the first 7 days after birth plus the birth of all stillborn fetuses after the period of viability. The data was analyzed using SPSS program.

Results

There were two distinct groups of patients. 30 had only history suggestive of cervical incompetence while 16 had history along with documented cervical changes detected on ultrasound.

The mean gestational age at cervical cerclage was 14 weeks and range was 12-24 weeks. The mean maternal age was 26 years with a range of 18-39 years (Table 1).

Thirty (71.8%) women had a history of previous, three to four, mid trimester losses (Table 2). Peroperative and postoperative complications were insignificant (Tables 3 and 4).

Full term delivery rate was 95.6% (Table 5). Forty five babies were born live while a perinatal death of only one baby was recorded. Average birth weight was 2800 gm, ranging from 1000 to 38000 gm.

Serious neonatal morbidity was seen in one case and minimal morbidity in 8 babies (17.8%).

Table 1: Maternal Characteristics of Patients with Cervical Cerclage

Maternal Characteristics	Mean +/-SD	Range
Maternal age	26 years	18-39
Cervical length at insertion of cervical cerclage	2.2 cm	3.5-1.5
Gestational age at delivery (weeks)	35 weeks	16-39 weeks
Gestational age at cervical cerclage	14 weeks	12-24

Table 2: Previous Obstetrical or Gynaecological History of Women with Cervical Incompetence.

Previous mid trimester losses		
O	0	0%
1-2	10	21.7%
3-4	30	71.8%
>4	4	6.5%
Previous preterm birth/premature preterm rupture of membrane		
0	36	78.3 %
1-2	6	13.%
3-4	4	8.7%
>4	0	0%
Previous History of Cervical surgery	0	
Cervical incompetence diagnosed before pregnancy	1	2.2%

Discussion

The cervical cerclage for the treatment of cervical incompetence was first reported by Herman in early 1900[12]. Since then many types of cervical procedures have been developed with placement at various times in the pregnant and non pregnant states. Cerclage is most beneficial in women with a history of recurrent painless midtrimester miscarriage. In these women it should be offered after 12 weeks of gestation. Given the choice of bed rest and undergoing cerclage most women accept cerclage.

Table 3: Per operative Complications of cervical cerclage

Complications	No of patients	Percentage
Injury to the surrounding tissues(bladder)	0	0%
Injury to the cervix	1	2,2%
PROM	0	0
Bleeding	1	2.2%
Complication of anaesthesia	0	0%

Table 4: Postoperative Complications of cervical cerclage

Complications	No of Patients	Percentage
Bleeding	1	2.2%
PPROM	0	0%
UTI	0	0%
Vaginitis	1	2.2%
Fever	0	0%

Table 5: Pregnancy outcome after cervical cerclage

Prolongation of delivery(weeks)	28 weeks	4-25 weeks
Mid trimester pregnancy loss	1	2.2%
Preterm delivery rate		
<28 weeks	1	2.2%
28- 34 weeks	0	0%
Term Delivery Rate	44	95.6%

The operation is associated with only fewer minor complications like increased incidence of post operative fever and vaginal discharge. Hence it is considered to be the safest choice in women with cervical incompetence[13]. This is proven in our study that only few patients had peroperative and post

operative complications.

This study reveals that mean gestational age at delivery was 35 weeks and it effectively prolongs the delivery interval (mean interval 28 weeks) and hence prevents preterm delivery rate especially at extremes of prematurity and improves neonatal survival rate. This is in contrast with the study of Althiusis et al. in which they compared management with and without therapeutic cerclage in women with risk factors and or symptoms of cervical incompetence considered to be at risk of of preterm delivery on the basis of measurement of a cervical length of <25 mm before a gestational age of 27 weeks[14]. The cerclage group had a higher mean gestational age at delivery , a longer interval between detection of short cervical length and delivery, a lower preterm delivery rate, a higher mean birth weight and a lower compound neonatal morbidity and 100% neonatal survival rate.

However, a randomized controlled trial conducted by Rus et al revealed no difference between cerclage and no cerclage group in terms of mean gestational age at delivery, preterm delivery rate before 28 weeks of gestation and neonatal morbidity and death[15]. Althiusis associated this difference in their outcome between the two studies to be related to the selection of patients[14]. In this trial by Rus et al serial transvaginal assessments of lower uterine segment were performed in patients who had risk factors for preterm births, while in study by Althuisis this was done in patients with risk factors for cervical incompetence. Rus et al hypothesized that the ultrasound findings during second trimester demonstrate a potential final common pathway of multiple pathophsiological processes such as infection, immunologically mediated inflammatory stimuli and subclinical abruption of placentas [15].

In another prospective observational study by Hibbard et al 43 women with cerclage and 42 women without cerclage were compared. There was a statistically significant difference in mean gestational age at delivery between cerclage and without cerclage group (34.0 + - 5.4 weeks Vs, 32 + -6.0 weeks; p value =0.04)[16].

We conclude that prophylactic cervical cerclage is a successful way of treating cervical incompetence.

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