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Pregnancy Outcome and Interval to Delivery After Cervical Cerclage in A Nigerian Tertiary Hospital

Abstract

Background: Evidences have shown the value of cervical cerclage in reducing the recurrent mid-trimester miscarriages or preterm birth in women with cervical incompetence.

Aim and Objectives: The aim of this study is to document the outcome of cervical cerclage in pregnancy and to determine the time interval to spontaneous delivery after elective removal of cerclage at term.

Materials and Methods: This is a retrospective analysis of patients who had cervical cerclage due to cervical incompetence at the Obstetrics and Gynecology department of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria from 1st January 2006 to 31st December 2015. The cerclage was termed successful if the pregnancy was carried to term.

Results: There were a total of 24,160 deliveries during the study period, of which 75 women underwent cervical cerclage, giving an incidence of 0.31%. The mean maternal age was

29.01 ± 5.41 years, with most women in their third decade of life. Elective cerclage was the most common type, performed in 51 (68.0%) women, while 24 (32.0%) had emergency cerclage. Empirical cerclage referred to cerclage placement based solely on poor obstetric history without current clinical or ultrasound evidence of cervical insufficiency. Cerclage was most frequently inserted between 14–16 weeks' gestation in 61 (81.3%) women. Overall, 45 (60.0%) women carried their pregnancies to term. Among those who delivered at term, only 6 (13.3%) delivered within 24 hours of cerclage removal. Of the 57 women with successful pregnancy outcomes, 42 (73.7%) had spontaneous vaginal delivery, while 15 (26.3%) required caesarean section. The fetal salvage rate was 76.0% (57/75), while 18 (24.0%) pregnancies ended in miscarriage. Fetal survival was significantly higher among women whose cerclage was removed at term (78.9%) compared with those who had removal before term (19.3%), with a statistically significant association ($p < 0.001$). Gestational age at cerclage removal was the strongest predictor of fetal outcome. Premature rupture of membranes was the most common complication observed.

Conclusions: Most pregnancies in patients with cervical incompetence progressed to term following cerclage insertion and only few delivered within 24 hours of cerclage removal at term.

Keywords: Cervical cerclage, Interval to delivery, Outcome

Research Article

Dr Zaro B[1]*, Dr Burodo AT[2], Dr Ukwu AE[2], Dr Nnadi DC[2], Dr Hassan M[2], Singh S[2], Ladan AA[2], Habib AA[3]

[1]Usmanu Danfodiyo University Teaching Hospital Sokoto State

[2]Department of Obstetrics and Gynaecology, Usmanu Danfodiyo University Teaching Hospital Sokoto State

[3]Department of Obstetrics and Gynaecology Rasheed Shekoni Federal University Teaching Hospital Dutse, Jigawa State

***Correspondence:** Zaro Boysungni, Departments of Obstetrics and Gynaecology, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria.
E-mail: boysungni@gmail.com

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Introduction

Cervical incompetence is a deficiency in the structural and or function of the sphincter mechanism of the internal os resulting in the inability of the cervix to retain an intrauterine pregnancy to term [1]. Recurrent mid-trimester pregnancy losses or premature delivery usually characterizes this condition. Preterm birth is a leading cause of neonatal morbidity and mortality [2]. The loss of a wanted pregnancy is a traumatic experience for any woman, more so if the fetus is normally developed as is the case with most second trimester abortion [1].

The history of mid-trimester miscarriages or preterm delivery with characteristic silent dilatation of the cervix is considered diagnostic of cervical incompetence [2,3]. The diagnosis of this condition during pregnancy is by vaginal examination and ultrasound assessment of the internal cervical os [1,3,4,5]. Other methods of diagnosis if the patient is not pregnant include, Hysterosalpingography (HSG), free passage of Hegar's dilator and Traction test [1,6,7]. Cervical cerclage has been widely used in the management of pregnancies considered to be at high risk of preterm delivery from cervical incompetence. Most cerclage were inserted after the first trimester when it is expected that first trimester miscarriages from other causes would have occurred [2,4,6]. Application of cervical cerclage to prevent miscarriage and preterm labour is practiced worldwide [5]. Cervical cerclage has been an integral part of the management of cervical incompetence at UDUTH, yet pregnancy outcome following cerclage has not been documented.

Aim/Objectives

The aim of this study is to document the outcome of cervical cerclage in pregnancy and interval to delivery after removal of cerclage.

Materials and Methods

This was a retrospective study conducted at UDUTH on patients who had cervical cerclage performed because of suspected Cervical Incompetence over a 10-year period (1st January 2006-31st December 2015). The study was approved by UDUTH Ethical Review Committee. The patient's case files were obtained from the Medical Records department. Patient's information was obtained using pre-designed questionnaires which included: Patient's biodata, past obstetrics history, gestational age at cerclage insertion, type of cerclage, complication after cerclage insertion, gestational age at cerclage removal, outcome of pregnancy, mode of delivery, and interval between elective removal of cerclage and delivery.

The data was analyzed using SPSS version 20. Chi-square was used for analysis of categorical variables while student's t-test was used for continuous variables. A p value less than 0.05 was considered to be statistically significant.

Results

The records of patients who underwent cerclage over a 10 years period were analyzed. There was a total of 24,160 deliveries over the study period, out of which 75 of them had cerclage insertion. This gives an incidence of cervical cerclage of 0.31%. The mean age was 29.01±5.41years and majority of the women were in their 3rd decade of life and most 42(56.0%) were nulliparous. Previous history of Manual Vacuum Aspiration (MVA) was the commonest 59(89.4%) risk factor among the women studied. Majority 51(68%) had elective cerclage and 19(25.3%) had emergency cerclage, while 5(6.7%) had empirical cerclage insertion. About 61(81.3%) had cerclage application at 14-16 weeks. While 45(60%) had their cerclage removed at term, 11(14.7%) had their own removed before 37 weeks due to preterm labour. The outcome of cerclage was adjudged successful in (76%) of cases and failed in (24%) cases. Out of the total number of those who had successful cerclage procedure, 42(73.7%) had Spontaneous vaginal delivery while 15(26.3%) had caesarean section. Only few patients 6(13.3%) delivered within 24 hours of removal of cerclage at term, while majority 25(55.6%) delivered within 2 weeks of cerclage removal at term. There was a statistically significant difference in fetal survival between the women whose cerclage was removed at term and those who had their own removed before term (pvalue=0.001), however no statistically significant difference in pregnancy outcome was found between those who had McDonald's stitch and those who had Shirodkar's (p value=0.748). The most frequent complication was premature rupture of membranes 10(34.5%).

Discussion

In this study, the incidence of cervical cerclage 0.31%, which was lower than the value obtained in Port-Harcourt and Edo [5,6]. However, it was similar to what was found in Zaria and Maiduguri [7,8]. The lower incidence found in the study may not be unconnected with the poor healthcare seeking behavior of the women in the studied area. In this study, it was discovered that majority of the women were nulliparous in their 3rd decade of life. This may be the reflection of the studied environment where childbearing is highly cherished and therefore these groups of people are more likely to seek medical attention. The peculiar risk factor in majority of the cases studied was previous MVA. The repeated MVA may result into recurrent traumatic insult on the cervix, and thus leading to the development of

cervical incompetence. Most patients had their cerclage insertion between 14-16 weeks gestation, this is in consistence with other studies [2,6]. Most cerclage is inserted after the 1st trimester when it is expected that 1st trimester miscarriages from other causes would have occurred. The study had revealed that most patients had McDonald technique. This may be as a result of its simplicity of insertion and removal, and low complication rate. However, there's no statistically significant difference in pregnancy outcome between those who had McDonald stitch and those who had Shirodkar techniques, (p value 0.748). In this study, most women had their cerclage removed at term, which is consistent with the literature when it is expected that there is full fetal lung maturity at term and the cerclage can be removed, while the woman could safely go into spontaneous labour any time after the removal. However, those who had cerclage removal before term was due to complications such as Premature Rupture of Membranes (PROM). A statistically significant difference was found in pregnancy outcome between the women who had their cerclage removed at term and those who had it removed before term, (p value 0.001). This study revealed that majority of the patients 25(55.6%), delivered within 2 weeks of removal of cerclage at term. This is similar to what was found in other studies [2,9,10]. Therefore after removal of cerclage, patients may be allowed to go home and come back when in labour since only few of them 6(13.3%) delivered within 24hours of cerclage removal. In this study, it was observed that majority 42(73.7%) had SVD while 15(26.3%) had CS. The CS rate was high presumably due to accompanying bad obstetrics history and additional obstetrics problems encountered during labour. The fetal salvage in this study was 57(76.0%). This is similar to what was found in some other studies [2,6]. Furthermore, the 76% fetal salvage recorded in this study buttresses the argument in favour of cerclage procedure as a measure to reduce pregnancy losses and improve fetal salvage in cases of cervical incompetence. Although cerclage can be said to be a safe surgical procedure, it is not without complications. In our study, the commonest complication found was PROM 10(34.5%) which is consistent with what was found in another study [2].

Conclusion

Most pregnancies in patients with cervical incompetence progressed to term after cerclage insertion with good fetal outcome. Majority of the patients delivered within 2 weeks of removal of the cerclage at term. Patients may therefore be allowed to go home after removal of cerclage to return when in labour.

Characteristics	Category	Frequency (n)	Percentage (%)
Age (Years)	Range	19-40	-
	Mean±SD	29.01±5.41	-
	≤ 19	2	2.7
	20-24	14	18.7
	25-29	24	32.0
	30-34	22	29.3
	≥ 35	13	17.3
Parity	0	42	56.0
	1-4	27	36.0
	≥ 5	6	8.0
Gestational Age at Insertion (Weeks)	Range	14-25	-
	Mean±SD	15.76±2.49	-
	14-16	61	81.3
	17-19	6	8.0
	≥ 20	8	10.7
Type of Cerclage	Elective	51	68.0
	Emergency	19	25.3
Method of Cerclage	McDonald	58	77.3
	Shirodkar	17	22.7

Table 1: Demographic and Clinical Characteristics of Patients (N = 75)

Risk Factor	Frequency (n)	Percentage (%)
Manual Vacuum Aspiration (MVA)	59	89.4
Previous Cerclage	3	4.5
Cervical Tear	4	6.1

Table 2.1: Risk Factors for Cervical Incompetence (N = 66)

Characteristics	Frequency	Percentage (%)
Gestational Age at Removal (Weeks)		
Range	16-39	-
Mean±SD	33.00 ± 7.56	-
≤ 27 weeks	19	25.3
28-36 weeks	11	14.7
37-38 weeks	45	60.0
Outcome of Pregnancy (N = 75)		
Alive	57	76.0
Abortion	18	24.0
Mode of Delivery (N =57)		
Spontaneous Vaginal Delivery (SVD)	42	73.7
Caesarean Section (CS)	15	26.3
Interval to Delivery (N = 45)		
≤ 24 hours	6	13.3
2-6 days	14	31.1

1-2 weeks	25	55.6
Complications (N = 29)		
Bleeding per vaginum	5	17.2
PROM	10	34.5
Urinary Tract Infection (UTI)	6	20.7
Vaginal Discharge	8	27.5
Indication for Removal (N = 75)		
Antepartum haemorrhage	7	9.3
False labour	16	21.3
Inevitable MISCARRIAGE	16	21.3
Labour	25	33.3
Preterm PROM	2	2.7
Preterm labour	3	4.0
PROM	6	8.0

Table 2: Cerclage Outcome with Labour and Fetal Characteristics

Factor	Dead (n = 18) Mean±SD / n (%)	Alive (n = 57) Mean±SD / n (%)	$\chi^{2\,/\,t\,/\,f}$	P Value
Age (years)	28.78±4.09	29.09±5.79	0.211[t]	0.834
Parity				
0	9 (50.0)	34 (60.0)		
1-4	7 (38.9)	21 (36.3)		
≥5	2 (11.1)	2 (3.6)	1.566χ^2	0.457
Type of Cerclage				
Elective	10 (55.6)	41 (71.9)		
Emergency	7 (38.9)	12 (21.1)		
Empirical*	1 (5.6)	4 (7.0)	2.301χ^2	0.316
Method of Cerclage				
McDonald	15 (83.3)	43 (75.4)		
Shirodkar	3 (16.7)	14 (24.6)	0.486 [f]	0.748
Gestational age at insertion (weeks)				
Mean±SD	15.83±3.05	15.74±2.33	0.142[t]	0.888
≤ 16	14 (77.8)	47 (82.5)		
17-19	2 (11.1)	4 (7.0)		
≥ 20	2 (11.1)	6 (10.5)	0.328χ^2	0.849
Gestational age at cerclage removal (weeks)				
Mean±SD	20.56±4.12	36.93±2.19	21.902[t]	< 0.001*
≤ 27	18 (100.0)	1 (1.8)		
28-36	0 (0.0)	11 (19.3)		
≥ 37	0 (0.0)	45 (78.9)	69.806χ^2	< 0.001*
Indication for cerclage removal				
Antepartum haemorrhage (APH)	0 (0.0)	7 (12.4)		
False labour	1 (5.6)	15 (26.3)		
Inevitable abortion	16 (88.9)	0 (0.0)		
Labour	0 (0.0)	25 (43.9)		
Preterm labour	0 (0.0)	3 (5.3)		
PPROM	0 (0.0)	2 (3.5)		
PROM	1 (5.6)	5 (8.8)	65.291χ^2	< 0.001*

χ^2 = Chi-square test; [t] = Independent samples t-test; [f] = Fisher's exact test
*Statistically significant (p< 0.05)
Empirical Cerclage: cerclage based solely on poor obstetric history without current clinical or ultra sound evidence
PPROM = Preterm Premature Rupture of Membranes

Table 3: Association Between Maternal, Procedural, and Removal Characteristics and Fetal Outcome Following Cervical Cerclage

Variables	Term	Preterm	$\chi^{2/t}$	Pvalue
	Mean±SD			
Age	28.38 ± 5.72	32.36 ± 5.28	2.100	0.040*
Parity	1.13 ± 1.44	0.55 ± 1.04	1.272	0.209
No of Previous	3.07 ± 2.15	2.91 ± 2.17	0.218	0.828
Miscarriages				
GA at Insertion	15.29 ± 1.41	17.73 ± 4.00	-3.387	0.001*
GA at Removal	37.73 ± 0.49	34.73 ± 1.85	9.792	< 0.001*
Method of Cerclage				
McDonald	34 (75.6)	8 (72.7)		
Shirodkar	11 (24.4)	3 (27.3)	0.038	0.846

χ2: Chi square, t: Independent Samples t-test; *: Statistically significant (i.e pvalue < 0.05)
*N = 56 includes only women who achieved delivery (term or preterm); pregnancies ending in miscarriage/abortion (n = 19) were excluded, accounting for the difference from the total cohort (N = 75).

Table 4: Factors that affect the Gestational age at Delivery in respondents with Cervical Cerclage (N*=56)

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