Original Research Article

A TEN-YEAR RETROSPECTIVE ANALYSIS OF FETOMATERNAL OUTCOME IN WOMEN WITH HAD CERVICAL CERCLAGE IN THE UNIVERSITY OF PORT HARCOURT TEACHING HOSPITAL, PORT HARCOURT, NIGERIA

ABSTRACT

Background: Cervical incompetence is a major cause of recurrent mid-trimester pregnancy losses with profound psychological effect on affected women. Intervention with the use of cervical cerclage has been shown to be generally beneficial.

Aim: The aim of the study was to determine the prevalence of cervical incompetence and the feto-maternal outcomes following cervical cerclage in patients with cervical incompetence at the University of Port Harcourt Teaching Hospital (UPTH) over a ten-year period.

Methodology: This was a ten-year retrospective review of case files of patients who had cervical cerclage for cervical incompetence in the University of Port Harcourt Teaching Hospital from January 2009 to December 2018. The records of 130 patients who underwent cervical cerclage within the study period were reviewed and relevant information extracted and analysed using SPSS version 25 software package. Chi square test was used to compare categorical variables and p value < 0.05 was considered significant

Results: The prevalence of cervical cerclage for cervical incompetence was 0.3%. The mean age was 33.6$\pm$ 5.3 years and majority were nulliparous 62 (47.7%), with most of them 116 (89.2%) having had a previous mid-trimester miscarriage. All the patients had elective prophylactic cerclage. Outcome of cerclage was adjudged good in 106 (81.5%) cases and failed in 24 (18.5%) cases based on the gestational age at the end of the pregnancy and the fetal outcome. The most frequent complication following cerclage was preterm prelabour rupture of membranes 10 (7.7%). Of the 116 patients with previous mid-trimester

miscarriages, 94 (81.0%) had good outcome while 22 (19.0%) had poor outcome. Patients with no prior history of dilatation and curettage had better pregnancy compared to those with previous dilatation and curettage (p=0.01).

Conclusion: Cervical cerclage resulted in improved pregnancy outcome in 81.0% of women with previous mid-trimester pregnancy losses. Patients with no previous history of dilatation and curettage had better pregnancy outcome.

Key words: Cervical cerclage, cervical incompetence, fetomaternal outcome, Port Harcourt

Introduction

Cervical incompetence is the inability of the cervix to support pregnancy to term as a result of a structural or functional defect of the cervix[1]. It leads to pre-viable or preterm termination of pregnancy due to cervical dilatation in the absence of any increase in baseline uterine activity or in the presence of mild uterine activity.[1] It is a well-documented complication of the second trimester of pregnancy.[1,2]

Cervical cerclage is an obstetric procedure in which sutures are placed around the cervix to prevent or treat cervical incompetence.[1,3] Cervical cerclage has been used widely in the management of pregnancies considered to be at risk of pre-term delivery from cervical incompetence.[4]

The incidence of cervical incompetence varies with different population and it has been reported to complicate about 1% of all pregnancies but rises to 8% in those who suffered a second or third trimester pregnancy loss[4,5] Incidences of 0.17%, 0.85%, 0.78% were reported in Port Harcourt, Ilorin and Benin respectively.[4-6]

Cervical incompetence is implicated as one of the major causes of recurrent late second trimester miscarriages which may lead to preterm deliveries. Preterm birth accounts for over 70% of all perinatal mortalities and is an important determinant of neonatal and infant morbidities including neurodevelopmental handicaps, chronic respiratory problems, infections and neonatal intensive care admissions.[4,7] It has been recognized that the prevention of preterm birth is crucial to improving pregnancy outcome. Neonatal prognosis is directly dependent upon the gestational age at birth; therefore, once a diagnosis of cervical insufficiency has been established, and provided there is no maternal contraindication to

maintain the pregnancy, all the available options to prolong the pregnancy should be discussed with the patients.[8,9]

Cervical incompetence can result from prior traumatic injury to the cervix associated with a prior pregnancy (dilatation and curettage (D&C) in the termination of pregnancy) or previous surgery (conization, amputation), congenital uterine anomalies (bicornuate uterus, septate uterus), intrauterine exposure to diethylstilbesterol (DES) or intrinsic deficiencies in cervical collagen and elastin which include Ehlers Danlos syndrome.[2,7]

The diagnosis of cervical incompetence is primarily based on a history of a previous mid trimester pregnancy loss and it is thus a retrospective diagnosis which can present with symptoms such as painless cervical dilatation and bulging of foetal membranes in the second trimester of pregnancy. Cervical incompetence could also present as preterm premature rupture of membranes or rapid delivery of a pre-viable infant.[10,11] Other ways of diagnosing cervical incompetence include; physical examination and ultrasound scan finding of a short cervical length <25mm and funnelling at the internal os.

Cervical cerclage is a well-known surgical procedure carried out during pregnancy. It involves inserting a stitch around the cervix with the aim of giving mechanical support to the cervix and thereby reducing the risk of preterm birth.[12] It was first introduced by Shirodkar in 1955 for treatment of cervical incompetence. Following several modifications, two years later, McDonald developed a simpler surgical procedure which became the gold –standard for the treatment of patients with cervical incompetence.[13] The Shirodkar suture is a trans-vaginal purse string suture inserted above the level of the cardinal ligament after bladder mobilisation while the McDonald suture is inserted lower at the cervico-vaginal junction, but without bladder mobilisation.[9,10,13] It is usually removed at 37 completed weeks before the onset of labour but can be removed before term if there are complications such as significant vaginal bleeding, intrauterine foetal death and preterm prelabour rupture of membranes.[8]

There is lack of consensus on the effectiveness of cervical cerclage and the same equivocation extends to its indications. Some authors have reported an improved perinatal outcome while some other studies reported no effectiveness on the risk of preterm delivery after cerclage insertion.[14,15] In Nigeria, clear beneficial effects of cerclage with 94.4% fetal salvage up from 23.7% before cerclage have been reported by various authors.[4,14]

The aim of this study was to determine the pregnancy outcome of women who underwent cervical cerclage for cervical incompetence in the University of Port Harcourt Teaching Hospital between the year 2009 and 2018. This will also contribute to the body of knowledge and also address the controversies regarding the efficacy of cervical cerclage in the management of cervical incompetence.

MATERIALS AND METHODS:

This was a retrospective study conducted at the University of Port Harcourt Teaching Hospital on patients who had cervical cerclage performed for suspected cervical incompetence over a 10-year period (2009- 2018) to assess the outcome of pregnancy. Permission was obtained from the Heads of the Department of Obstetrics and gynaecology and Medical records for the use of hospital records for this research. The theatre records of all cases of cervical cerclage done within the study period were compiled and the case notes retrieved from the medical records department and relevant data were extracted and entered into a structured proforma. All women who underwent cervical cerclage during the period under review were included in the study, however those with incomplete records were excluded.

Patients details were obtained from the case files included; age, occupation, parity, the gestation period in weeks at the diagnosis of cervical incompetence and at insertion of the cerclage, complications of the cerclage, gestational age at cerclage removal as well as foetal outcome. The cerclage procedures were all prophylactic (elective) as it was based on past history of miscarriages.

The cervical dilatation as assessed by the surgeon on digital pelvic examination at operation was obtained from the surgical notes. Record of immediate and late complications after cerclage were also extracted. The pregnancy outcome was categorised as miscarriage (below 28 weeks gestation), preterm delivery (before 37weeks), term delivery (37 weeks and above). The cerclage was termed successful if the pregnancy was carried to term or foetal take home.

Data was managed using SPSS version 25.0 and analysis performed using simple descriptive statistics like means, frequencies and cross-tabulations. Data were presented as simple frequency tables and bar charts. Chi square (x^2) test was used to compare categorical variables and p value < 0.05 was considered significant.

Results

There were 152 cases of patients who had cervical cerclage out of 22,139 deliveries during the 10-year period under review giving a prevalence of 0.3%. However, out of 152 patients who had the operation, adequate records were available in 130 (83.4%) patients and this these comprised the study population. The demographic and clinical characteristics of the study population are shown in Table 1: the mean age was 33.5 $\pm$ 5.3 years. In terms of parity, nulliparity was the most frequent and accounted for 62 (47.7%) patients. In Table 2, the pattern of previous miscarriages or mid-trimester miscarriages showed that most of the study population 120 (92.3%) had a previous miscarriage and 116 (89.2%) had a previous mid-trimester miscarriage. Most 92 (70.8%) of the women had no prior dilatation and curettage whereas 38 (29.2%) had a previous dilatation and curettage.

Forty-four patients (33.8%) had previous cerclage in their last pregnancy. The mean gestational age at cerclage insertion was 15.8$\pm$ 3.2 weeks. All cerclage procedures were carried out using regional anaesthesia (subarachnoid block) and the McDonald technique was used for all cases. The mean cervical dilatation at cerclage insertion was approximately 1cm; patients remained in the hospital between seven and twenty-one days with a mean duration of 14 days. One hundred and twenty-six patients (96.9%) had salbutamol for tocolysis after the procedure.

Pregnancy outcome was worse in patients who had multiple (3 or more) previous mid-trimester miscarriages (figure 1). Eighty (87.0%) out of the 92 patients with no history of

D&C had good pregnancy outcome whereas 26 (68.4%) out of 38 patients with previous history of D&C had good pregnancy outcome and the difference was statistically significant (X^2= 6.14, P=0.01) (figure 2).

The mean gestational age at delivery was 34.2± 6.2 weeks. Twenty (15.4%) patients had spontaneous abortion, 16 (12.3%) had preterm deliveries while 94 (72.3%) had term deliveries. Outcome of the cerclage was adjudged good in 106 (81.6%) cases (this inclusive of 7 preterm deliveries) with a success rate of 81.8% recorded in the 44 patients with previous history of cervical cerclage as shown in figure 3. Most cerclage sutures were removed at term in 94 (72.3%) who had term deliveries.

Out of the 120 patients with previous pregnancy loss through miscarriages who had cerclage procedure, 84 (70%) had term deliveries, 14 (11.6%) had preterm births while 22 (18.3%) had a repeat spontaneous miscarriage. Cervical cerclage is generally a safe procedure as 92 (70.8%) had no complications and failed (subsequent miscarriages) cerclage was recorded in 24 (18.5%) cases (table 3). Generally, the fetal take home rate was 81.5% (106) in this study.

DISCUSSION

The benefit of mid-trimester cervical cerclage in pregnancies has been the subject of research. In this study, the efficacy and the outcomes of cervical cerclage were evaluated. The analysis of hospital data reports a cervical cerclage rate of 0.3% among the antenatal population, a rate slightly higher than the 0.17% reported by Ikimalo et al[6] from a previous study in the same centre which shows an increase in the acceptance of the procedure.

Historical background of a recurrent mid-trimester miscarriage remains key to diagnosis of cervical incompetence as was observed in this study where majority of the study population had a history of previous miscarriage in 92.3% and 89.2% having at least one mid-trimester miscarriage. In a similar study done by Adewole et al., they reported history of recurrent mid-trimester miscarriage in 78.1% of their study population.[16]

The social pressures on women after the loss of a wanted pregnancy, access to information on cervical cerclage on the internet and the premium placed on child bearing in our setting are paramount reasons for offering prophylactic cervical cerclage. This was evident by a significant proportion (33.8%) of the study population who had a previous cervical cerclage. In this study, all the cerclage procedures were prophylactic and this finding is consistent with findings from another study in sub-Saharan Africa by Osemwenkha et al who reported 90.2% prophylactic cerclage procedures compared with urgent and emergency cerclage procedures.[4] An overall success rate in terms of prolongation of pregnancy to term of 72.3% and fetal salvage rate of 106 (81.5%) shown in this study further butresses the argument in favour of cervical cerclage procedure as a means to reducing pregnancy losses and improving perinatal

survival. In Ikimalo et al, following cervical cerclage, term delivery occurred in 68.8% of the study population.[6] Previous studies have reported a wide range of pregnancy outcomes from 43.8% term deliveries in Tanzania to 76.8% in Zambia.[17,18] Feyi-Waboso reported 92.2% fetal salvage rate.[14]

Despite the inconsistencies that exist in the diagnosis and management of cervical incompetence, cervical cerclage has become an established treatment for cervical incompetence. This was the conclusion in the study by Osemwenkha et al and Adewole et al. following 63.4% and 71.9% term deliveries respectively.[4,16] However, a study done by Drakeley et al. in a meta-analysis involving 6 randomized controlled trials did not establish any conclusive benefit of cervical cerclage in women with mid-trimester pregnancy losses.[15] He noted that it was not possible to rule out other causes of abortions, premature deliveries and intrauterine fetal death in these studies.[15] The effectiveness of cervical cerclage seems better when applied prophylactically compared to when done as an emergency as seen in Osemwenkha et al where 75.7% of the elective cerclage were successful compared to 100% failed procedure of those that had emergency cerclage.[4] The better pregnancy outcome and fetal salvage rate recorded in this may be attributed to the fact that all the cerclage procedures were prophylactic.

The mean gestational age at cerclage insertion in this study was 15.8 weeks. This is similar to studies done by Adewole et al. and Feyi-Waboso et al. where most cervical cerclage procedures are done after the first trimester when it is expected that first trimester miscarriage from chromosomal abnormalities or from other causes would have occurred and also at this gestational age, the amniotic sac and its contents begin to fill the uterine cavity contributing to progressive cervical dilatation.[14,16] The McDonald's technique was employed in all patients as it is simpler to insert and remove and causes less haemorrhage compared to the Shirodkar technique.

Dilatation and curettage has long been recognised as a risk factor for cervical incompetence and was the only predisposing factor obtained from the case notes of these patients. It is worthy to note that other predisposing factors such as congenital malformations of the uterus and intrinsic deficiencies in cervical collagen and elastin are difficult to substantiate in resource poor settings.[2,7] Patients with no prior history of D&C were observed in this study to have better pregnancy outcome following cervical cerclage than those with a previous history of D&C ($p < 0.05$). This may imply that cervical cerclage for other causes of cervical

incompetence other than from D&C may have better outcome and therefore limiting the need for D&C by preventing unwanted pregnancy through effective contraceptives may improve pregnancy outcome.

Although cervical cerclage is a relatively simple and safe surgical procedure, it is not without complications. In this study, majority 92 (70.8%) did not develop any form of complications however 24 patients (18.5%) had failed cerclage from subsequent spontaneous miscarriage while 10 (7.7%) had premature rupture of fetal membranes and 2 (1.5%) had vaginal bleeding. This is in contrast with the study done by Feyi-Waboso et al. where urinary tract infection, vulvovaginitis were the most observed complications.[14] Drakeley et al in his meta-analysis concluded that cervical cerclage is a safe surgical procedure with no serious morbidity. [15]

Conclusion: Despite the inconsistencies that exist in the diagnosis and management of cervical incompetence, cervical cerclage for suspected cases of cervical incompetence is associated with potential for considerable prolongation of pregnancy and reduction in perinatal morbidity and mortality in carefully selected patients.

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Table 1

Social demographic characteristics

	Frequency (N=130)	Percentage (%)
Age Group		
20-29	30	23.1
30-39	84	64.6
40-49	16	12.3
Occupation		
Civil Servant	54	41.5
Self Employed	2	1.5
Business	40	30.8
Unemployed	34	26.2
Parity		
0	62	47.7
1	38	29.2
2	14	10.8
3	14	10.8
4	2	1.5

Table 2

Factors associated with cervical incompetence

Variable	Frequency (N=130)	Percentage (%)
Number of Miscarriage		
0	10	7.7%
1	14	10.8%
2	50	38.5%
3	24	18.5%
4	10	7.7%
5	10	7.7%
6 and above	12	9.2%
Number of Previous Mid-Trimester Miscarriages		
0	14	10.8%
1	28	21.5%
2	48	36.9%
3	22	16.9%
4 and above	18	13.8%
Number of Previous Dilatation and Curettage		
0	92	70.8%
1	12	9.2%
2	10	7.7%
3	10	7.7%
4 Above	6	4.6%
Number of Previous Cerclage		
0	86	66.2%
1	26	20.0%
2	16	12.3%

3	2	1.5%

Figure 1. Number of Previous Mid-trimester Miscarriages and Pregnancy outcome

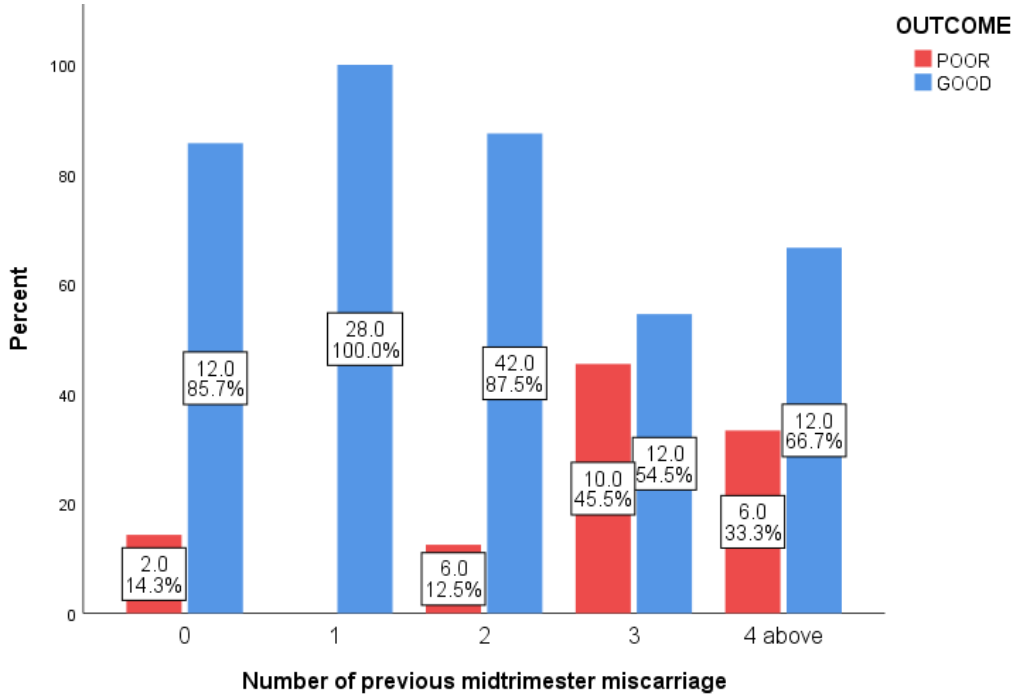

Figure 2. Number of Previous Dilatation and Curettage and Pregnancy outcome.

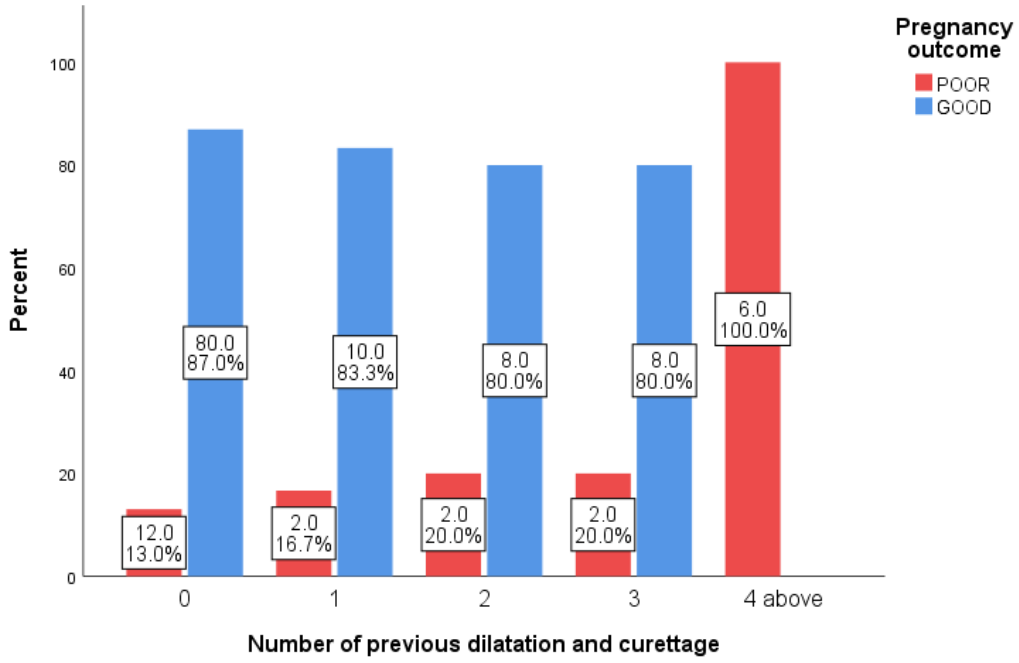

Figure 3: Previous cerclage and pregnancy outcome

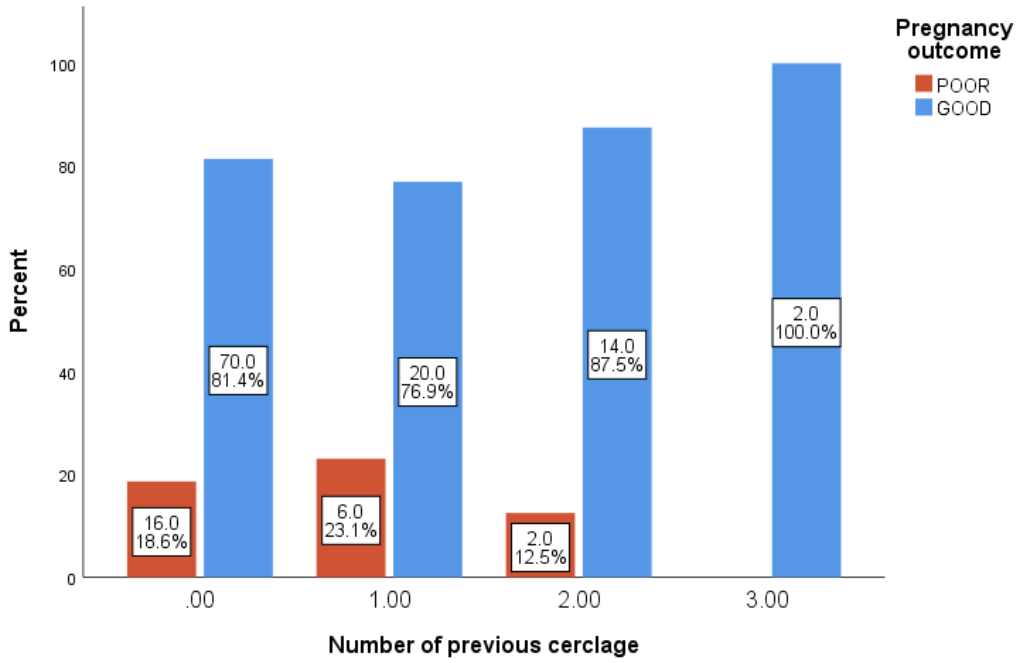

Table 3

Complications associated with cervical cerclage

Complications	Frequency (130)	Percentage
None	92	70.8
Failed	23	18.5
PPROM	10	7.7
Vaginal bleeding	2	1.5
Vaginal discharge	2	1.5

PPROM- Premature prelabour rupture of foetal membrane