

Practice of Cervical Cerclage at a University Teaching Hospital in Southern Nigeria

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Abstract

Background: Although the aetiology of preterm deliveries is largely unknown, it is said to be multifactorial and cervical insufficiency has been implicated. Hence, cervical cerclage is a necessary and common prophylactic obstetric procedure for preventing prematurity and associated recurrent second trimester miscarriages. **Objectives:** To evaluate the pattern, indications, and fetal outcome of cervical cerclage. **Methodology:** This was a retrospective study of 50 women who had cervical cerclage insertion at the University of Port Harcourt Teaching Hospital between January 1, 2021, and December 31, 2022. Data was obtained from the ward registers, theatre records, and case notes of the women, and entered into a structured proforma. Data analysis was done with SPSS version 25, and results are presented as frequency tables and charts. **Results:** The mean age of the patients was 35 ± 2.07 years. The mean of number of previous miscarriages was 2.46 ± 2.07 , 56.8% were multiparous and 50% had a previous manual vacuum aspiration. Majority 35 (70%) of the women had prophylactic cerclage, 10 (20%) had cerclage following in-vitro fertilization and embryo transfer pregnancy, while 5 (10%) had rescue cerclage. Most 29 (58%) of the prophylactic cervical cerclage insertion were done between 11-15 weeks, with MacDonald technique being the most common technique practiced. Of these, only 18 (36%) carried the pregnancy up to 36 weeks of gestation. **Conclusion:** Many of cervical cerclage procedures were performed for prophylaxis and resulted in improved fetal outcomes in women who had previously experienced mid-trimester losses or preterm delivery.

Keywords: Cervical insufficiency, Cervical cerclage, Preterm birth, Fetal outcome, Port Harcourt.

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INTRODUCTION

Globally, 15 million preterm deliveries occur with incidences ranging from 5% to 18% [1]. Complications from preterm births are the leading causes of mortality among children under 5 years of age and accounted for approximately 1 million deaths in 2015 [2]. Three-quarters of these deaths could be prevented with current cost-effective interventions. There is a rising trend in both developed and developing countries due to advancement in assisted reproductive techniques, which has contributed to more multifetal pregnancies [3]. Iatrogenic preterm deliveries following improved antenatal surveillance and identification of at-risk pregnancies leading to earlier intervention remains another factor [3]. Therapeutic prevention through the use of improved pharmacological tocolytics are yet to yield much result and can be seen as disappointing or minimal [3].

Therefore, the focus is now on the prediction and primary prevention of preterm births. Despite the aetiology of preterm deliveries being largely unknown, it is said to be multifactorial. A common cause or aetiology irrespective of the onset is that there is a primary dysfunction of the cervix which loses its ability to provide mechanical strength to withhold pregnancy leading to a cascade of events resulting in cervical shortening and dilatation [3].

Cervical insufficiency is usually characterized by dilatation and shortening of the cervix before the 37th week of gestation in the absence of preterm labour, and it is classically associated with painless, progressive dilatation of the uterine cervix in the second or early third trimester resulting in membrane prolapse, premature rupture of the membranes, midtrimester pregnancy loss or preterm birth [4-6].

The term cervical incompetence or insufficiency describing this event is defined as the inability of the uterine cervix to retain a pregnancy in the absence of uterine contractions or labour [2]. It is characterized by painless opening and shortening of the cervix uteri between 16 and 28 weeks of gestation resulting in fetal wastage [7]. Globally, the incidence of cervical incompetence varies from 1:54 to 1:222 pregnancies. It is responsible for 15-20% abortions in the second trimester [7]. Other studies suggest 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]. In Nigeria, the incidence is between 0.17% to 0.85% [4, 5].

With increased knowledge and improvements in modern medicine for cervical insufficiency or cervical incompetence, the search for a primary prevention led to the obstetric procedure known as the cervical cerclage. Currently, cervical cerclage remains an important obstetric procedure for prevention of prematurity and recurrent second trimester miscarriages. Both diagnoses are presently a dilemma in modern obstetrics and perinatal medicine globally [3].

Despite being a common prophylactic procedure that has been used over many decades, the cervical cerclage procedure remains one of the most controversial surgical interventions in Obstetrics. Cervical cerclage was first performed in 1902 in women with a history of mid-trimester miscarriage or spontaneous preterm birth suggestive of cervical 'incompetence', with the aim of preventing recurrent loss [8] and prolonging the pregnancy as long as possible. Palmer and La Comme had provided an extensive description of this condition in 1948 [5] and by 1955 Shirodkar had proposed his technique of cervical cerclage [9]. Over the years, several surgical techniques have been developed for its treatment, either with vaginal approach or in some cases through the trans-abdominal route [9-11].

Hence, the study sought to review the current practice of cervical cerclage in patients with presumed risk of pregnancy loss due to cervical insufficiency.

MATERIALS AND METHODS

Study Area

A two-year retrospective institution-based cross-sectional study was conducted at the obstetric unit of the University of Port Harcourt Teaching Hospital (UPTH, Southern Nigeria. It serves as a referral centre for all levels of health care in Rivers state and other neighbouring states. Consultant obstetricians, specialist senior registrars, and registrars lead teams of experienced nurses and midwives in the obstetric unit.

Methods

Data was extracted from theatre records, delivery registers, and case notes and entered into a proforma. The folders of the selected patients were retrieved from the hospital's Records department. Record review included information on socio-demographic characteristics, the indication for the cerclage insertion, the gestational age at insertion, and outcome of the cerclage. All women who had cervical cerclage during the period under review were included in the study. Patients who did not continue antenatal care at the facility after the procedure and those with incomplete records were excluded. However, those with incomplete records were excluded.

Ethical Approval

The Research and Ethics committees of the hospital approved the study, and administrative permission was obtained from the heads of the Obstetrics and Gynaecology department and medical records department. The proforma was labeled with unique identifiers and did not include hospital numbers. There was no direct interaction with the women as the study simply analyzed their case records, hence informed consent from the women was not necessary.

Statistical Analysis

Data was entered and analyzed using SPSS version 25.0. All categorical variables were summarized in frequency tables and charts using descriptive statistics such as frequencies, and percentages.

RESULTS

There were 2307 deliveries during the period under review. Of these, 57 women had cervical cerclage inserted for different reasons, giving an incidence of 2.47%. A total of 50 case files were retrieved and suitable for analysis, making the retrieval rate 87.72%. The mean age was 35 ± 2.07 years, while the mean parity was 0.88 ± 0.9 . This is shown in Table 1.

Table 2 shows the clinical characteristics of patients who had cervical cerclage. Majority 24 (48%) of the women had 2-3 miscarriages, with a mean of 2.46 ± 2.07 , 31 (56.82%) were multiparous, 47 (94%) had no previous dilatation and curettage, while 25 (50%) had a previous manual vacuum aspiration.

As shown in Table 3, 35 (70%) of the women had prophylactic cerclage, 10 (20%) had a cerclage following in-vitro fertilization and embryo transfer procedure (IVF-ET) and 5 (10%) had rescue cerclage. It also showed that 18 (36%) had previous cerclage insertion and 29 (58%) of cerclage insertion was at 11-15 weeks gestation.

In Table 4, 7 (14%) of patients were lost to follow up as they had their antenatal care and delivery outside UPTH, while 18 (36%) delivered between 36-41

weeks of gestation. Figure 1 shows the summary of fetal outcome, with 57% of the pregnancy ending in a live birth.

Table 1: Socio-demographic characteristics of the women

| Variable | Frequency N=50 | Percentage % |
|---------------------------|----------------|--------------|
| Age | | |
| 22-26 | 2 | 4.0 |
| 27-31 | 7 | 14.0 |
| 32-36 | 25 | 50.0 |
| 37-41 | 13 | 26.0 |
| 42-46 | 2 | 4.0 |
| 47-51 | 1 | 2.0 |
| Occupation | | |
| Accountant | 2 | 4.0 |
| Banker | 1 | 2.0 |
| Business | 14 | 28.0 |
| Civil servant | 16 | 32.0 |
| Corper | 1 | 2.0 |
| Entrepreneur | 6 | 12.0 |
| Housewife | 2 | 4.0 |
| Lawyer | 1 | 2.0 |
| Public servant | 1 | 2.0 |
| Student | 2 | 4.0 |
| Trader | 4 | 8.0 |
| Level of Education | | |
| Secondary | 9 | 18.0 |
| Tertiary | 41 | 82.0 |

Table 2: Clinical characteristics of the women

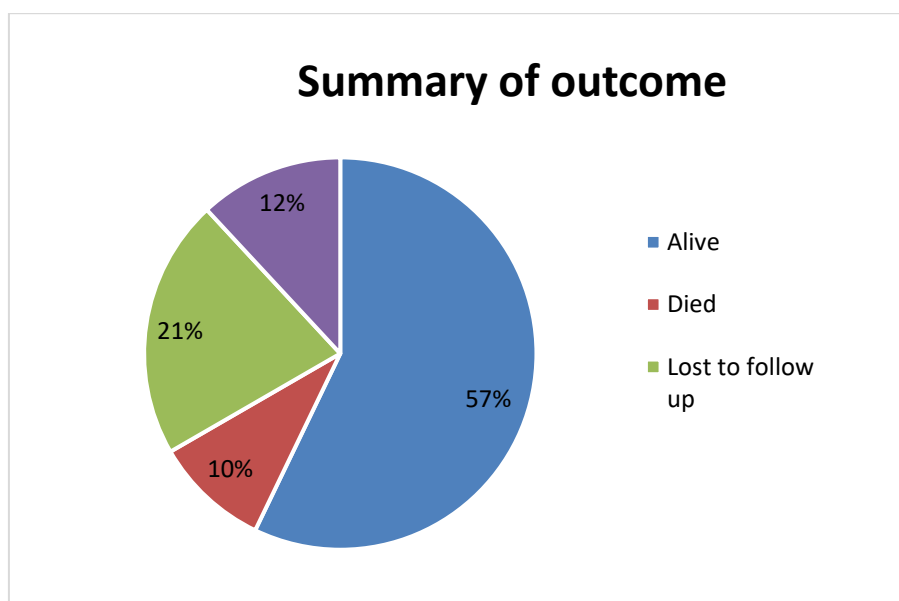
| Attributes | Frequency N= 50 | Percentage % |
|--|-----------------|--------------|
| Number of Miscarriages | | |
| 0-1 | 16 | 32.0 |
| 2-3 | 24 | 48.0 |
| 4-5 | 5 | 10.0 |
| 6-8 | 5 | 10.0 |
| Parity | | |
| 0-1 | 19 | 43.2 |
| 2-4 | 31 | 56.8 |
| Previous Dilatation and Curettage | | |
| No | 47 | 94.0 |
| Yes | 3 | 6.0 |
| Previous Manual Vacuum Aspiration | | |
| No | 25 | 50.0 |
| Yes | 25 | 50.0 |

Table 3: Type of cerclage and gestational age at insertion of cervical cerclage

| Variable | Frequency N= 50 | Percentage % |
|--|-----------------|--------------|
| Type of Cerclage | | |
| Post IVF and ET | 10 | 20.0 |
| Prophylaxis | 35 | 70.0 |
| Rescue cerclage | 5 | 10.0 |
| Gestational age at insertion of cerclage | | |
| 11-15 | 29 | 58.0 |
| 16-20 | 16 | 32.0 |
| 21-25 | 5 | 10.0 |
| Previous History of cervical cerclage insertion | | |
| No | 32 | 64.0 |
| Yes | 18 | 36.0 |

Table 4: Gestational Age at delivery following cervical cerclage

| Variable | Frequency N= 50 | Percentage % |
|---------------------|--------------------|--------------|
| 12-17 | 1 | 2.0 |
| 18-23 | 8 | 16.0 |
| 24-29 | 7 | 14.0 |
| 30-35 | 9 | 18.0 |
| 36-41 | 18 | 36.0 |
| Delivered elsewhere | 7 | 14.0 |

**Figure 1: Fetal outcome****Table 5: Clinical and Demographic Characteristics**

| Variables | Mean \pm SD | Range |
|----------------------------------|-------------------|----------|
| Maternal age (years) | 35 \pm 2.07 | 22 – 49 |
| Parity | 0.88 \pm 0.9 | 0 – 4 |
| Number of previous miscarriages | 2.46 \pm 2.07 | 0 – 8 |
| Gestation at cerclage (weeks) | 15.8 \pm 3.33 | 11 – 25 |
| USS Cervical length (cm) | 3.18 \pm 1.15 | 0.73 – 6 |
| USS Cervical dilatation (cm) | 0.37 \pm 0.73 | 0 – 2 |
| Previous D and C | 44% | |
| Previous MVA | 50% | |
| Duration of Hospital Stay (days) | 19.62 \pm 39.54 | 1-180 |

DISCUSSION

The practice of cervical cerclage remains an important obstetric procedure. Globally, despite the controversy that exist with the practice of this common procedure, its contribution to prevention of prematurity and associated recurrent second trimester miscarriages cannot be in doubt. This study reflects the practice of this procedure as previous studies within the same institution have been conducted but with emphasis on the cervical incompetence or insufficiency.

Previous retrospective study reported a cervical cerclage prevalence of 0.3% compared to a prevalence of 2.47% in our study [9]. Also, 56.82% were multiparous, the mean of previous miscarriages in these 50 women was 2.46 ± 2.07 , with a range of 0-8 and 48% of these women had a previous history of 2-3 mid trimester miscarriages. In a population-based cohort study, women who had cervical cerclage were likely to have an index pregnancy that ended in a birth at 20-27 weeks gestation [10].

A previous study within the same institution reported that all cervical cerclages done were inserted as prophylaxis for cervical incompetence in patients with a history of previous pregnancy losses [9]. In contrast, our study observed that only 70% of cerclages were inserted prophylactically, while 20% were inserted following an IVF-ET procedure even when the patients did not have a history of previous pregnancy loss, and 10% were inserted as rescue cerclage in the index pregnancy. In another study where cervical cerclage was inserted mainly for prophylaxis, the indications were grouped into three namely, history-indicated, ultrasound-indicated, and rescue cerclage group respectively [11].

In this study, about one-third of the women delivered between 36 weeks and 41 weeks of gestation. Therefore, it should be taken into consideration to perform cervical cerclage procedures electively before the process of preterm labour begins and during the early stage of cervical changes rather than when the process of incompetence has started.

CONCLUSION

The practice of insertion of cerclage after an IVF-ET procedure is rapidly gaining ground in obstetric practice, adding to the controversy surrounding this common but necessary procedure. In general, the practice of cervical cerclage in at-risk pregnancies has been shown to improve pregnancy outcome, with the McDonald technique the technique of choice. The study centre has recently increased its practice of laparoscopic and other minimal access surgeries, opening an avenue for possible alternate routes.

The limitation of our study is that it is a hospital-based retrospective study done within a short period. As a result, larger population-based studies are needed to improve on the findings of this study.

Conflict of Interests: Authors declare that they do not have any conflict of Interest.

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