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Original Article

A thirteen - year retrospective review of the management of cervical incompetence using cervical cerclage at the University of Maiduguri Teaching Hospital, Borno State, Nigeria

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Abstract

Background: Cervical incompetence, defined as the inability of the cervix to support a pregnancy to term due to a functional or structural defect of the cervix, is an important obstetric condition. The pregnancy outcome of patients with cervical incompetence can be improved with the application of cervical cerclage. **Objectives:** To determine the prevalence and risk factors of cervical incompetence and pregnancy outcome following insertion of cervical cerclage. **Methodology**: This was a hospital-based descriptive retrospective study that reviewed all cervical cerclages performed for cervical incompetence at the University of Maiduguri Teaching Hospital (UMTH) over 13 years. (January 2011 and December 2023).
The data obtained included sociodemographic characteristics of the study patients, risk factors for cervical incompetence, and pregnancy outcomes. Data management and statistical analysis were performed using SPSS version 25. **Results:** The prevalence of cervical cerclage was 9.1/1000 deliveries, and the mean age of the study population was 30± 6.3 years, and the mean parity was 2.5±1.5. All the patients (100%, 56/56) were married, and 37.5% (21/56) were housewives. The identified risk factor in the majority of the cases studied was the previous history of manual vacuum aspiration, 46.4% (26/56), and following insertion of cervical cerclage, 46.4% (26/56) of the study patients had term live births. **Conclusion:** Cervical incompetence is not uncommon in our environment, and the pregnancy outcome of the patients can be improved using cervical cerclage.

Keywords: *Cervical cerclage, Cervical incompetence, UMTH.*

Introduction

Cervical incompetence is defined as the inability of the cervix to support a pregnancy to term due to a functional or structural defect of the cervix.[1] It is characterized by acute, relatively painless dilatation of the cervix, usually in the mid-trimester, resulting in the prolapse and/or
premature rupture of the membrane with resultant preterm delivery. [1,2]
The risk factors of cervical incompetence can be congenital, which include congenital uterine anomalies such as the septate uterus, bicornuate uterus, uterine didelphys, and low cervical collagen content, and in - utero exposure to diethylstilbestrol.[3,4,5,6] The acquired causes include: loop electrosurgical excision procedure, cone biopsy, trachelectomy, obstetric laceration, and excessive forceful mechanical cervical dilatation.[3,4,5,6]
The prevalence of cervical cerclage reported ranges between 0.17 to 0.28%.[2,6,7] Cervical cerclage has been used widely in the management of pregnancies considered to be at high risk of miscarriage/preterm delivery from cervical incompetence. It provides mechanical strength to the cervix, acts to prevent

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infection, prolapse of the Fetal membrane, and premature rupture of the membrane, thus preventing prematurity and improving pregnancy outcome.[8,9,10, 11, 12]

Cervical Cerclage was first described by Shirodkar in 1955 and modified by McDonald in 1965 with a similar outcome.[2] The McDonald stitch is easier to apply and commonly used in most obstetric practice because of its simplicity of insertion and removal, and low complication rates.[1,2]

Complications associated with cerclage insertion include premature rupture of the membrane, maternal sepsis, cervical injury, vaginal bleeding, and suture migration.

There are conflicting reports regarding the efficacy of cervical cerclage. While some studies, including a meta-analysis of RCTs, show cerclage insertion improves perinatal outcome and prevents mid-trimester miscarriage and preterm birth,[3,4, 10,] another meta-analysis [11] shows it does not improve pregnancy outcome. A previous study done in our Centre shows improvement of perinatal outcome following cerclage insertion, 5, but it was done 17 years ago. As cervical cerclage is the main management of cervical incompetence in our Centre, this study aims to appraise this important intervention in the 15 years under review.

Materials and methods

Study design

This was a hospital-based descriptive retrospective study that reviewed all the cervical cerclages done in the University of Maiduguri Teaching Hospital (UMTH) over thirteen years. (January 2011 and December 2023).

Study area

This study was carried out at the University of Maiduguri Teaching Hospital, UMTH, Maiduguri, Nigeria. Maiduguri is located in North-Eastern Nigeria, between latitude 11.5^0N and longitude 13.5^0E. The UMTH is the largest tertiary referral health care centre in the region, serving as the referral centre for the entire state and its environs.

Ethical consideration

Approval to carry out the study was obtained from the Research and Ethics Committee of the University of Maiduguri Teaching Hospital (Appendix I). The data collected was kept with the utmost confidentiality

Methodology

The hospital numbers and the names of all patients that underwent cervical cerclage done because of cervical incompetence over the study period were obtained and documented from the theatre registry of the hospitals and used to retrieve patients' folders from the medical record department of the hospitals sequentially, year by year. A proforma was used to retrieve information to answer the study objectives (prevalence, risk factors, outcomes, and complications of cerclage).

The data obtained included sociodemographic characteristics of the study patients, such as age, occupation, educational status, and marital status. Other data obtained includes parity risk factors of cervical incompetence, complications of the cerclage procedure, and outcome of the pregnancy.

Data management and statistical analysis were performed using SPSS version 25 (IBM, SPSS Statistics). Descriptive statistics were used to summarise continuous data. Categorical data were presented in tables as frequencies and percentages.

The diagnosis of cervical incompetence was based on the history of recurrent mid-trimester miscarriage/preterm delivery and/or USS findings of a short cervix or dilatation of the internal os. The cervical cerclage insertions were done by consultants/residents following standard technique between 12- 18 weeks of gestational age after USS was done to confirm fetal viability and rule out the fetal anomaly.

The prevalence of cervical incompetence for the study period was calculated as a percentage ratio of the total number of cerclage insertions done during the study period to the total number of deliveries done during the same period.

A short cervix is when the cervical length is <25mm measured using vaginal USS in the early second trimester, and vulvovaginitis is defined as malodorous vaginal discharge with or without itching.

Result

During the study period, there were 98 cervical cerclages inserted because of cervical incompetence and a total of 10,769 deliveries; a prevalence of 9.1/1000 deliveries. A total of 68 case folders were retrieved from the medical record department, but only 56 folders that had complete information were utilized for analysis; the retrieval rate of 57.1%.

During the research period, 98 cervical cerclage surgeries were done, and the medical records department sent us 68 patient folders. Only 56 files, however, included all the information on the main research variables (sociodemographic features, risk factors, complications, and pregnancy outcomes);

these were the only ones used in the final analysis. The other 12 files didn't have comprehensive information on important characteristics like the outcome of the pregnancy or the gestational age at the time of cerclage implantation; they were left out of the statistical analysis to minimize misclassification and bias.

A total of 68 case documents were retrieved (retrieval rate 69.4%), of which 56 contained complete data and were incorporated into the final analysis.

The mean age of the study population was 30 ± 6.3 years (range: 18 – 42 years), and the mean parity was 2.5±1.5 (range: 1 – 6).

Table 1. Sociodemographic characteristics of the study population

CHARACTERISTICS	FREQUENCY	PERCENTAGE
Occupation		
Civil servant	23	41.1
Housewife (unemployed)	21	37.5
Artisan	12	21.4
Total	56	100
Marital status		
Married	56	100
Total	56	100
Educational status		
Primary	5	8.9
Secondary	17	30.4
Tertiary	30	53.6
Quranic	4	7.1
Total	56	100

Table 2: Parity distribution of the study population

PARITY	FREQUENCY (%)
Nullipara	2(3.6)
Multipara	49(87.5)
Grand multipara	5(8.9)
TOTAL	**56(100)**

Table 3: Gestational age at the insertion of the cervical cerclage

GESTATIONAL AGE (weeks)	FREQUENCY (%)
12	2(3.6)
13	14(25.0)
14	21(37.5)
15	7(12.5)
16	3(5.4)
18	7(12.5)
TOTAL	**56(100)**

The demographic characteristics of the study population are shown in Table 1. All patients (100%, 56/56) were married, and 37.5% (21/56) were housewives. Up to 56.3% (30/56) had tertiary education.

Table 2 shows the parity distribution of the study population, with the majority of the patients being maltiparas 87.5%(49/56), while Table 3 shows that the majority of the cerclage 37.5% (21/56) were inserted at 14 weeks of gestation.

The identified risk factor in the majority of the cases studied was a previous history of manual vacuum aspiration, 46.4 %(26/56), and most of the patients had repeated manual vacuum aspiration due to recurrent abortions. Prior preterm birth was seen in 28.6 %(16/56). (Table 4)**.**

Table 4: Risk factors of cervical incompetence of the study patients

RISK FACTOR	FREQUENCY (%)
Manual Vacuum Aspiration	26(46.4)
Preterm Birth	16(28.6)
Previous Miscarriage	11(19.6)
Mechanical cervical Dilation	03(5.4)
TOTAL	**56(100)**

Table 5 below shows complications associated with cerclage insertion. Twenty-five (44.6 %) had no complication, 10(17.9 %) had preterm contractions, 9(16.1 %) had vulvovaginitis

Table 5: Complications of cervical cerclage insertion in the study population

COMPLICATION	FREQUENCY (%)
Premature contraction	10(32.3)
Vulvovaginitis	9(29.0)
Premature Rupture of Membrane	7(22.6)
Vaginal bleeding	3(9.7)
Preterm Labour	2(6.4)
TOTAL	**31(100%)**

Table 6 shows the pregnancy outcome of the patients after cerclage insertion. Forty-six per cent (26/56) of the study patients had term live births.

Table 6: Pregnancy outcome of the study population

PREGNANCY OUTCOME	FREQUENCY (%)
Live birth	26(46.4)
Preterm birth	19(33.9)
Miscarriage	8(14.3)
Stillbirth	3(5.4)
TOTAL	**56(100)**

Discussion

In this review, the prevalence of cervical cerclage due to cervical incompetence was 9.1/1000 deliveries.

Although this prevalence is similar to that reported from the previous study in our environment,[5] was far lower than the 17/1000 and 78/1000 obtained in Port Harcourt6 and Edo[7,] respectively. This may not be unrelated to differences in the study population's health-seeking behaviour.

The commonest risk factor of cervical incompetence found in this study was a history of recurrent manual vacuum aspiration (MVA) due to previous abortions. This is similar to a study done in other studies. [13,14,15] Repeated MVA probably resulted in a culminating cervical injury that resulted in cervical weakness. It could also be that the women have suffered multiple pregnancy losses as a result of Cervical incompetence before its diagnosis.

In this study, no patient presented with a congenital uterine anomaly. This is, in contrast, to the study done in Kenya, with 11.6% of the patients presenting with congenital uterine defects.[1] This is also observed in another study where 60% of patients had preterm delivery after cerclage insertion due to uterine anomaly.[15] Could it be that we are missing congenital uterine defects during our patient evaluation, as only a grey-scale ultrasound scan is done in the majority of our patients' evaluations?

Following cervical cerclage insertion, 44.6 %of the patients had no complication, 7.9 % had preterm contractions, 16.1 % had vulvovaginitis, 12.5% premature rupture of membrane, and 5.4 % had vaginal bleeding. This is in contrast to a study done in Enugu[11,] where vaginal bleeding is the commonest complication. Meticulous attention to technique, careful haemostasis, and strict asepsis will reduce or eliminate the identified complications of cervical cerclage insertion.

This study reinforces the general clinical observation in our environment that cervical incompetence is prevalent among the literate/higher socio-economic group, with 53.6% having a tertiary education. This is in agreement with a report by Egwuatu and coworkers that found a higher incidence of literacy and higher socioeconomic class in their study patients.[11] This is more likely because these groups are more likely to seek treatment for their condition. Easier access to medical care in the urban areas where the literacy level is higher may be contributory.[16]

In this study, the foetal outcome was good, with about 46.4 % of patients having a term delivery, but 33.9 % had a preterm birth. Reports of pregnancy outcomes after cervical cerclage vary, with some authors[17] reporting good outcomes similar to the findings of this study. However, in a meta-analysis of randomized controlled trials by Drakeley et al, there was no statistical difference in pregnancy outcome between intervention (those with cerclage) and non-intervention groups.[11] The positive outcome found in this and the other studies could be due to the study's design being observational and therefore subject to selection and information bias.

Conclusion

This research implies that cervical incompetence is a significant obstetric condition that is encountered in our environment, and that cervical cerclage may enhance pregnancy outcomes in certain patients. Nevertheless, the results should be interpreted with prudence, as only a portion of the patient records were accessible for analysis. To more accurately assess the efficacy of cervical cerclage in our context, additional prospective studies with more comprehensive datasets are advised.

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