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Original Research Article

Cervical cerclage for cervical insufficiency: methods and pregnancy outcomes at a tertiary hospital in South-Western Nigeria

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ABSTRACT

Background: A 'gold standard' for the treatment of cervical insufficiency is by inserting cervical cerclage. This intervention may not be successful in all cases. Hence, there is a need to assess the methods and pregnancy outcomes of cervical cerclage, and draw conclusion from the findings. Objectives were to assess the methods and pregnancy outcome of cervical cerclage in women with cervical incompetence at the federal teaching hospital, Ido-Ekiti, Ekiti State.
Methods: This is a 5-year retrospective review of the records of women that had cervical cerclage between June 2019 and June 2024. The data were retrieved and analyzed for their socio-demographic factors, clinical characteristics, landmark past clinical events, number of past cerclage insertions, and the methods and pregnancy outcomes of index cerclage. The data obtained were analyzed using SPSS version 26.
Results: There were 27 cases of cerclage placement per 2,489 deliveries (1 in 92 births) during the period under review. The mean age was 33.6±4.8 years. Majority (74.1%) aged 31 to 40 years. Two-thirds of women (66.7%) had no prior births, 25.9% had one birth, and 7.4% had two or more births. The McDonald's technique was the most commonly used method, accounting for 92.6% of cases. Favourable outcome was recorded in 85.2% of the women.
Conclusions: This study showed that majority of the women treated with cerclage had successful pregnancy outcome, further supporting this intervention as a "gold standard" for managing cervical incompetence.

Keywords: Incidence, Cervical incompetence, Methods of cerclage, Complications, Pregnancy outcome

INTRODUCTION

Cervical incompetence is a leading cause of recurrent spontaneous second trimester miscarriages and preterm deliveries.[1,2] It complicates about 1% of all pregnancies and up to 8% of spontaneous second trimester or preterm births.[2,3] Cervical incompetence, currently being referred to as cervical insufficiency, is defined as the inability of the cervix to sustain pregnancy to term either due to structural (anatomical) or functional defects.[2,4] The usual mode of clinical presentation in cervical incompetence is in form of pre-viable pregnancy loss or preterm delivery with no baseline uterine contractions or if at all, minimal uterine activity.[1,2,5] The majority of women with cervical incompetence have identifiable risk factors preceding the mid-trimester pregnancy losses and these include previous dilatation and curettage, traumatic labour with cervical laceration, cone biopsy, cervical amputation, connective tissue disorders and congenitally short cervix as seen in those with in-utero exposure to synthetic oestrogen

knowns as diethylstilbestrol.[2,6-8] The above risk factors may be seen in women with cervical incompetence in additional to positive history of recurrent miscarriages in the second trimester of pregnancy and painless cervical dilation or premature rupture of fetal membranes prior to age of viability.[1,2,4,5] There may be no identified risk factors in certain women and a high index of suspicion may be the needed tool in making prompt diagnosis of cervical incompetence.[1,5,9] During pregnancy findings from ultrasound scanning may reveal cervical changes with progressive shortening of the cervical length from the initial normal T-shaped cervix to U-shaped cervix with bulging of fetal membranes.[10,11] The standard treatment for cervical incompetence is cervical cerclage which has various methods of insertions that include Shirodkar's, McDonald's, transabdominal (Benson et al), 'lash and lash's techniques.[12-15] Some studies have also revealed various modifications such as the triangular-3-bites technique and double cerclage insertions which are also associated with improved pregnancy outcomes.[16,17] Cerclage could be placed as prophylactic, elective or emergency depending on the indications, timing and cervical dilatation with bulging membranes.[18-20] McDonald's technique is the preferred method for cerclage placement in the West African Sub-region due to shorter duration of procedure, minimal blood loss, less risk of scar formation and less chances of cervical dystocia.[2,4] Cerclage is usually inserted after first trimester to allow for pregnancy losses from chromosomal abnormalities which usual account for the majority of the miscarriages in the first trimester.[21,22] Gestational ages of between 14-17 weeks have been quoted in a study as being appropriate for cerclage insertion.[23] Cerclage procedure has complications and varying degree of outcome, and this study was carried out to appraise the methods, complications and pregnancy outcomes of cases of cervical incompetence managed using cerclage placement at our centre, aiming at improving our practice and overall success of this intervention.

METHODS

This is a retrospective study that involved the review of the cases of cerclage placement in pregnant women with cervical incompetence from June 2019 to June 2024. The hospital folders of these women were retrieved from the medical record department of the federal teaching hospital, Ido-Ekiti. The delivery register was also reviewed to arrive at the total number of births during the same period. A total of 31 patients with cervical incompetence were managed with cervical cerclage during the period under review. One patient's folder was missing, one woman relocated to another city (her management was completed at another hospital), two women had delivery in another hospital during COVID-19 lockdown (no access to the pregnancy outcomes) while 27 patients completed their care in our facility. Therefore, 27 folders were retrieved with detailed information needed to meet the objectives of the study extracted using a standardized proforma designed by the principal researcher and the research assistants. A total of 2,489 deliveries were recorded during same period. The socio-demographic factors, clinical characteristics of the patients, the landmark event prior to index cerclage, the number of times cerclage had been inserted, methods of cerclage insertion used, associated complications and pregnancy outcome were retrieved from the case files of those 27 women and data were analyzed using statistical package for the social sciences (SPSS) version 26.

RESULTS

There were 27 patients with cervical incompetence managed with cerclage placement during this period and there were 2,489 deliveries, giving a prevalence of cervical incompetence of 1.1% (1 per 92 deliveries). The majority (20/74.1%) of the 27 participants were between 31 and 40 years old, with a mean age of 33.6 years and a standard deviation of ±4.8 years. A smaller proportion (6/22.2%) aged 21 to 30 years, while only one patient (1/3.7%) was aged 41 to 50. In terms of parity, two-thirds of women (18/66.7%) had no prior births, 25.9% (7) had one birth, and 7.4% had two or more births. Regarding education, more than half of the women (14/51.9%) had tertiary education, 29.6% (8) had secondary education, 11.1% (3) had primary education, and 7.4% (2) had no formal education. The majority of women were married (96.3%), employed (70.4%), and identified as Christians (92.6%). Most of the patients were of Yoruba ethnicity (88.9%), with smaller proportions identifying as Igbo (7.4%) and Hausa (3.7%) (Table 1).

Over half of the patients (15/55.6%) reported having three or more prior abortions, while 37.0% (10) had two abortions and 7.4% (2) had one abortion. Most of the women (19/70.4%) had no prior live births, while 29.6% (8) had at least one live birth. Few patients had a prior cervical laceration (1/3.7%) or a congenitally short cervix (2/7.4%). Past cerclage insertions were noted in 11 (40.7%) of participants, with most having had one prior cerclage 16 (59.3%). The outcomes of past cerclage insertions were favorable in 72.7% (8) of cases, while 27.3% (3) experienced previously failed cerclage (Table 2).

The McDonald's technique was the most commonly used method for cerclage placement, accounting for 92.6% (25) of cases. Of these, 88.9% (24) were elective procedures, while 3.7% (1) were rescue (emergency) procedure. The Shirodkar's technique and the double transvaginal technique were each used in 3.7% (1) of cases. Regarding complications, 40.7% (11) of women experienced an infected cerclage or abnormal vaginal discharge. Preterm births occurred in 14.8% (4) of cases, with 11.1% (3) resulting in live births and 3.7% (1) in stillbirth. Significant bleeding occurred in 3.7% (1) of cases, while 29.6% (8) reported no complications (Table 3).

Figure 1 shows the outcomes of current cerclage placement among the 27 cases. The majority had favourable outcomes, with successful pregnancy outcomes

being the most common result. A smaller proportion experienced complications, such as preterm births, infections, or stillbirths. Using the dichotomy of good versus poor outcome, 85.2% (23) of the cases had good outcome following cerclage intervention. The data highlighted that, despite some complications, cerclage placement generally resulted in positive outcomes for most women.

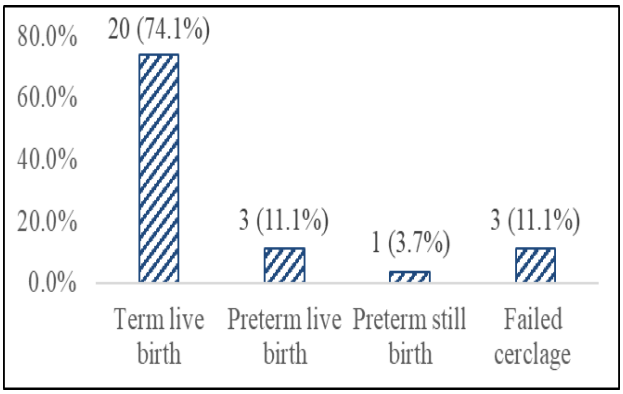

Figure 1: Outcome of current cerclage placement, (n=27).

Table 1: Socio-demographic characteristics of clients managed with cerclage placement, (n=27).

Variables	N	Percentage (%)
Age (in years)		
21-30	6	22.2
31-40	20	74.1
41-50	1	3.7
Mean age±SD	33.6±4.8	
Parity		
0	18	66.7
1	7	25.9
≥2	2	7.4
Level of education		
None	2	7.4
Primary	3	11.1
Secondary	8	29.6
Tertiary	14	51.9
Marital status		
Married	26	96.3
Unmarried	1	3.7
Employment status		
Employed	19	70.4
Unemployed	5	18.5
Housewife	3	11.1
Religion		
Christianity	25	92.6
Islam	2	7.4
Tribe		
Yoruba	24	88.9
Igbo	2	7.4
Hausa	1	3.7

Table 2: Landmark clinical events prior to cerclage placement, (n=27).

Clinical event	N	Percentage (%)
Priority abortions		
1	2	7.4
2	10	37.0
≥3	15	55.6
Prior live births		
Yes	8	29.6
No	19	70.4
If yes (n=8)		
Preterm	6	75.0
Term	2	25.0
Prior cervical laceration (traumatic birth)	1	3.7
Congenitally short cervix	2	7.4
Past cerclage insertions		
Yes	11	40.7
No	16	59.3
Number of the past cerclage insertions, (n=11)		
1 time	8	72.7
2 times	3	27.3
Outcome of past cerclage, (n=11)		
Favourable	8	72.7
Previously failed cerclage	3	27.3

Table 3: Current cervical Cerclage placement methods and complications, (n=27).

Clinical event	N	Percentage (%)
Methods of cerclage placement		
McDonald's technique	n=25	92.6
Elective	24	88.9
Rescue	1	3.7
Shirondkar's technique	1	3.7
Double transvaginal technique	1	3.7
Associated complications		
Significant bleeding during cerclage placement	1	3.7
Infected cerclage/ abnormal vaginal discharge	11	40.7
PROM with abortions <28 weeks	3	11.1
Preterm births	4	14.8
Live births	3	11.1
Stillbirth	1	3.7
Nil complication recorded	8	29.6

Table 4: Associations between women's characteristics and their pregnancy outcomes.

Variables	Outcome, N (%)		Chi-square	P value
	Good	Poor		
Age (in years)				
21-30	6 (100.0)	0 (0.0)	8.775	0.012
31-40	18 (90.0)	2 (10.0)		
41-50	0 (0.0)	1 (100.0)		
Parity				
0	15 (83.3)	3 (16.7)	0.398	0.819
1	6 (85.7)	1 (14.3)		
≥2	2 (100.0)	0 (0.0)		
Level of education				
None	1 (50.0)	1 (50.0)	3.464	0.325
Primary	2 (66.7)	1 (33.3)		
Secondary	7 (87.5)	1 (12.5)		
Tertiary	13 (92.9)	1 (7.1)		
Marital status				
Married	22 (84.6)	4 (15.4)	0.181	0.670
Unmarried	1 (100.0)	0 (0.0)		
Employment status				
Employed	19 (100.0)	0 (0.0)	12.209	0.002
Unemployed	2 (40.0)	3 (60.0)		
Housewife	2 (66.7)	1 (33.3)		
Religion				
Christianity	22 (88.0)	3 (12.0)	2.119	0.145
Islam	1 (50.0)	1 (50.0)		
Tribe				
Yoruba	17 (70.8)	7 (29.2)	0.822	0.663
Igbo	1 (50.0)	1 (50.0)		
Hausa	1 (100.0)	0 (0.0)		
Priority abortions				
1	2 (100.0)	0 (0.0)	0.851	0.653
2	9 (90.0)	1 (10.0)		
≥3	12 (80.0)	15 (20.0)		

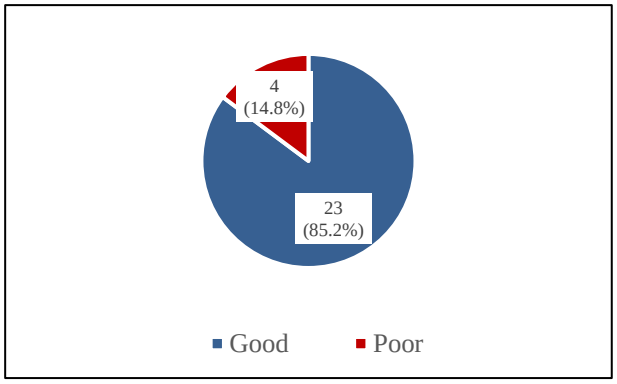

Figure 2: Pregnancy outcome, (n=27).

DISCUSSION

Cervical cerclage is a globally recognized intervention for women with diagnosis of incompetent cervix (insufficient cervix) that results in wastages of pregnancies in their second trimester. Cervical incompetence is also a major factor to be considered in preterm delivery in which there is little or no baseline uterine activity.[2,5] In this study, prevalence of cervical incompetence was found to be 1.1%, giving 1 per 92 deliveries. This is similar to the reported incidence of 1-5% in previous studies.[3,5] The mean age of the women that had cerclage placement in this study was 33.6 years±4.8 (SD) which is expectedly within reproductive age of women. This finding is similar to those of other studies in Nigeria and in Pakistan where the mean age of women that had cerclage were 32.4 years and 31.4 years respectively.[5,23] Two-third (66.7%) of the women were nulliparous (no prior birth), 25.9% had one birth, 7.4 being multparous with 2 or more births. Similarly, Wekere et al reported that 53.1% were nulliparous in their study conducted in the Southern part of Nigeria.[23] The majority of the women were married (96.3%), employed (70.4%), and identified as Christians (92.6%). Most of the patients were of Yoruba ethnicity (88.9%), with smaller proportions identifying as Igbo (7.4%) and Hausa (3.7%). This underscores the fact that the study was conducted in the Yoruba language speaking part of Nigeria. All the patients had prior miscarriages. Three or more prior

abortions were reported in 55.6% of the women, 37.0% had two abortions and 7.4% had no abortion. Abortions, especially the voluntary terminations, have been implicated in the risk factors for cervical incompetence.[2,8] Other associated risk factors documented in our studies included traumatic birth with cervical laceration (3.7%), congenitally short cervix (7.4%) and 70.4% had no documented preceding precipitating factors for cervical incompetence. Some other studies have reported gynaecological procedures such as cone biopsy and cervical amputation as well as in utero exposure to diethylstybestrol as the implicating factors.[2,6-8]

Cervical purse-stringing technique described by McDonald et al in 1965 with many modifications in modern day practice was used for the majority (92.6%) of the women that had cerclage insertions.[13] Shirodkar technique was deployed in a woman (3.7%) with a previously failed transvaginal cerclage and ultrasound documented short cervix.[12] These findings are line with reports from other studies which stated that McDonald technique should be the first line in cervical cerclage placement in the Sub-Sahran Africa due to its simplicity, shorter duration, reduced incidence of surgical bleeding and less risk of cervical scarring.[23,24] Similarly, Wekere et al reported that all the patients in their study had MacDonald method of cerclage insertions.[23] One woman was managed using double cerclage which was similar to the findings of Damalie et al in Ghana and Hortu et al in Turkey where double cerclage insertions were deployed when transvaginal options failed.[17,24] Benson et al described transabdominal placement of cerclage in those with failed transvaginal cerclage, but none of the patients managed in our facility had transabdominal cerclage.[14] This option of placement of cerclage involves abdominal entry via laparotomy or laparoscopy and subsequent placement of cerclage at the cervico-ishmic junction.[14,25] Only one woman (3.7%) in this study had rescue (emergency) cerclage as against findings in the study conducted at the South-south Nigeria by Wekere et al in which both elective and emergency cerclage were performed.[23]

Some complications of this cervical intervention have been described including cervical amputation, fistula formation, uterine rupture, vaginal infection, premature rupture of membranes and urinary bladder calculi.[26-28] In our study, abnormal vaginal discharge was seen in the majority of the women (40.7%) which may be due to the braided cerclage (mersilene tape). Also, in our study, these women were not screened for pelvic inflammatory disease prior to pregnancy and endocervical swab for microscopy, culture and sensitivity was not done for them at presentation. Therefore, cerclage alone could not be nailed as the only cause of the abnormal vaginal discharge in this category of women.

Most of the women (85.2%) in this study had favourable outcomes defined herein as live births following cerclage insertion whether late preterm or term. Reported success of cervical cerclage ranges between 76.8-90%.[29,30] Considering the patients' characteristics and their pregnancy outcomes, maternal age was associated with good pregnancy outcome significantly with p=0.012 (Table 4). All women aged 21-30 years had good outcome, 90% of women between ages 31-40 years also had favourable results while one woman in the age range of 41-50years had poor outcome. Employment status also showed a significant association with pregnancy outcomes with p=0.002. All employed patients in this study had good outcome while 60% of unemployed patients had poor outcome. These findings suggest that age and employment status play a critical role in determining pregnancy outcomes among women who underwent cervical cerclage placement in our study.

Limitations

This study is a retrospective review of cases of cervical cerclage placement in our environment; findings cannot be generalized to other parts of Nigeria or the world due to varying socio-demographic characteristics and limited health resources in different populations. Hence, 'multi-centre and multi-national' randomized controlled trials are advised to scientifically support some of the findings from our study.

CONCLUSION

Cervical cerclage remains the "gold standard" intervention for women with second trimester miscarriage due to cervical incompetence and success rate could be very high as seen in this study in which 85.2% of the women had favourable pregnancy outcome. In view of the abnormal vaginal discharge recorded in the majority (40.7%) of these women, active screening for both pre- and post-cerclage vaginal infections will go a long way to still improve on the pregnancy outcome beyond the current level.

Recommendations

We therefore recommend that McDonald' s cerclage placement should remain a standard treatment in our environment while double transvaginal cerclage may be considered as an alternative to transabdominal cerclage after a failed transvaginal cerclage and not necessarily after 2 or more failed attempts.

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