

Cervical cerclage in the treatment of cervical incompetence in Zambian women

M. WALOCH

Summary: Over a period of 5 years from January 1989 to October 1994, 207 patients with cervical incompetence were managed with Mac Donald's cervical cerclage at Nkana/Wusikili Mine Hospitals, Kitwe, Zambia. The incidence rate of cervical incompetence in our population was 1.47%. Our results confirmed a success rate of 90.8% as compared to 52.5% in previous pregnancies. This represents 159 (76.8%) full term pregnancies, 29 (14%) premature deliveries and 19 (9.2%) abortions. Post operation total survival rate was 87.4% with fetal salvage ratio of 1.68. We confirmed that optimum time to insert cerclage was 18 weeks and below.

The possibility of having a mature baby in the group of low number previous abortions was significantly higher as compared to the group with a higher number of habitual abortions.

Better pregnancy outcome was seen in low parity group (less than 2 previous deliveries) as compared to higher parity group.

Our study confirms that cervical cerclage is a successful way in the treatment of cervical incompetence.

INTRODUCTION

In Africa there still exists a tradition of having large families especially among the low social economic communities. In this group there is a high association of habitual abortion, premature labour and early prenatal mortality. Cervical incompetence has been recognised as the leading cause of habitual abortions in mid-trimester.

Since the time that a surgical approach for the treatment of cervical incompetence

was published by Lash and Lash⁽¹⁾, Palmer⁽²⁾ and Shirodkar⁽³⁾, the Shirodkar operation has been modified by many individual doctors but, nevertheless, the principal operation has remained the same.

The effect of cervical cerclage on the survival rate of the foetus has been studied extensively in the Western World^(4, 5, 6, 7, 8, 9) and elsewhere with documented marked improvement in foetal salvage⁽¹⁰⁾.

In Africa there is scanty information on this but studies done by Egwuatu⁽¹⁴⁾ with foetal salvage improvement of 73.4% from a preoperative rate of 11.35% have been recorded as well as those done by Ruminjo and Nuwagaba⁽¹¹⁾ from Kenya which have confirmed that McDonald's cervical cerclage⁽¹³⁾ has a high success rate in a rural setting (69.5% delivered at term).

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In this study we would like to share our 5-year Zambian experience of managing patients with cervical incompetence using cervical cerclage at Nkana and Wusikili Mine Hospitals in Kitwe. Our interest was to find out the correlation of the outcome of pregnancy with the time cerclage was done, or if outcome of pregnancy depended on maternal age, number of previous abortions, etc.

PATIENTS AND METHODS

From January 1989 to October 1994 207 patients with cervical incompetence were operated-on. All except one were Zambians. Selection of patients for the operation was based on Curzen's (12) criteria: a short, soft, dilated cervix with or without bulging membranes (dilatation less than 3 cm), a history of two or more consecutive midtrimester abortions with a typical history of cervical incompetence, a live intra-uterine pregnancy, absence of clinical evidence of chorioamnionitis, absence of vaginal bleeding, patients with habitual abortions but with no true evidence or history of cervical incompetence.

Before surgery all patients had a scan done to confirm foetal viability. All had HVS (high vaginal swab) taken for bacteriological cultures and sensitivity and were treated accordingly where indicated.

Surgery was performed electively under general anaesthesia between 12-18 weeks and as an emergency after 18 weeks. Cerclage was performed in accordance with McDonald's method (13). Postoperatively patients were maintained for 48-72 hours of bed rest with bathroom privileges. Patients with advanced pregnancy of 20 weeks were given prophylactic tocolytics for a few days. The average length of stay in hospital after operation was five days. In the absence of any complaints and uterine contractions the patients were discharged and were followed-up closely antenatally.

Cerclage sutures were removed at about 35-36 weeks gestation or whenever labour became established or after premature rupture of membranes or bleeding from the cervical canal.

We analysed the incidence of cervical cerclage according to maternal age, number of previous deliveries (parity) and number of previous abortions.

Among the group of habitual abortions we assessed the critical time when abortion occurred and analysed the most suitable time for placement of the cervical cerclage.

The outcome of pregnancy was assessed in terms of abortion rates, premature deliveries (birth weight 101-2500 grams) and mature deliveries (birth weight > 2500 grams).

Finally, we compared foetal outcome with the number of previous abortions, number of previous deliveries (parity) and maternal age to find out prognostic factors contributing to the outcome. We also analysed the complications of cervical cerclage including bacteriological status based on HVS which can also be responsible for abortions and premature deliveries.

Due to the small number of data for statistic analysis correlation outcome of pregnancy we combined columns in each analysed group.

Statistical analysis was with the X test or Fisher's exact probability test.

RESULTS

Over a 5-year period we collected 207 cases of cervical incompetence.

The study looked at the age distribution (Table 1), parity (Table 2) and history of previous abortions (Table 3).

Figure 1 shows the critical period for previous abortions, which is crucial in determining the optimal period for intervention.

Among the operated 207 patients we distinguished 2 major groups: first group

Table 1. — *Distribution of patients by age group.*

Maternal age	Number of patients
≤ 20	9 (4.3%)
21 - 25	44 (21.2%)
26 - 30	70 (33.8%)
31 - 35	61 (29.4%)
> 35	23 (11.1%)

Table 2. — *Distribution of patients by number of previous abortions.*

Number of previous abortions	Number of patients
0	32 (15.4%)
1 - 2	105 (50.7%)
3 - 4	54 (26%)
> 4	16 (7.7%)

Table 3. — Distribution of patients by number of previous deliveries (parity).

Number of previous deliveries (Parity)	Number of patients
0	31 (14.9%)
1-2	95 (45.9%)
3-4	59 (28.5%)
> 4	22 (10.6%)

129 (62%) on whom the cervical cerclage procedure was performed before 18 weeks gestation time, and the second group represented 78 (38%) patients who were operated during and after 19 weeks of pregnancy (Fig. 2).

As shown in Table 4 patients operated before 18 weeks had a significantly higher percentage of abortions (13.1% vs 2.5%) as compared to results obtained in the second group. In the foregoing group the percentage of premature (birth weight 1001-2500 grams) and mature (> 2500 grams) born babies remained similar.

Figure 3 summarises the obstetric histories of patients before and after cervical cerclage. Our results confirm a success rate of 90.8%. This represents 159

(76.8%) full term pregnancies (> 2500 grams) and 29 (14%) premature deliveries (1001-2500 grams).

Unfortunately, among these two groups we lost 7 babies of whom 4 were fresh stillbirths (2-premature and 2-mature), 1 macerated stillbirth and 2 early neonatal death (1-premature and 1-mature). Post-cerclage total survival rate was 87.4% with fetal salvage ratio of 1.68. Mean gestation age at delivery for total number of patients was 34.5 ± 10.9 weeks and 88% of patients delivered at ≥ 32 weeks. Nineteen abortions (9.2%) occurred between 12 and 28 weeks through there was no specificity of time in relation to occurrence of abortions.

There were 165 spontaneous vaginal deliveries and 14 (6.7%) caesarean sections.

DISCUSSION

According to several authors, cervical cerclage is procedure of choice for patients presenting with cervical incompetence in the midtrimester of pregnancy⁽¹⁰⁾.

The incidence of cervical incompetence that required surgical approach in our

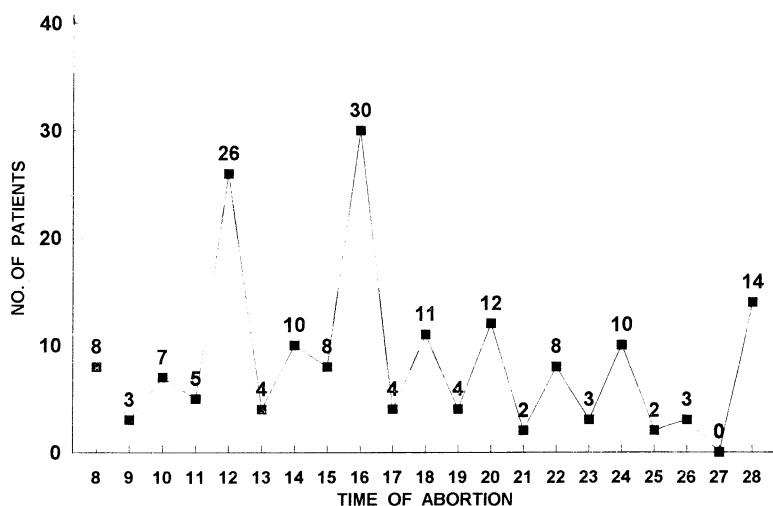


Fig. 1. — Distribution by gestation time previous abortions (total no. 174).

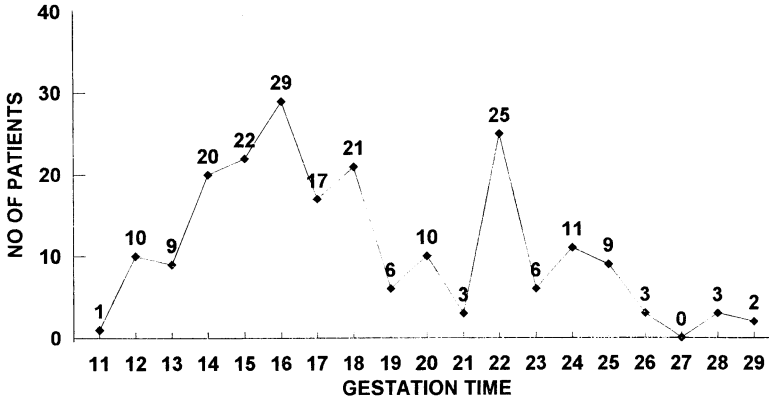


Fig. 2. — Gestation time at cervical cerclage insertion.

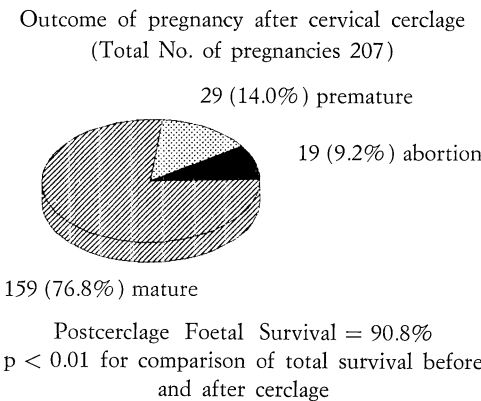
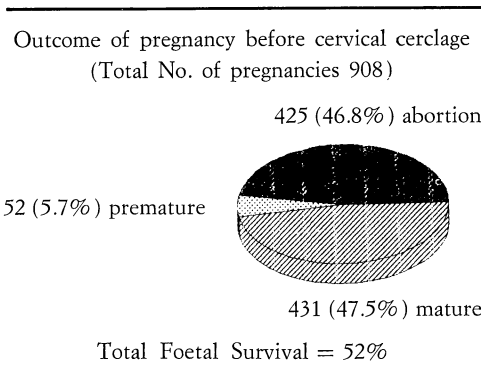


Fig. 3.

population was 1.47% (207/14027 total number of deliveries). This was higher than data from Nigeria (¹⁴) and Denmark (¹⁵).

In our study we achieved a success rate of 90.8% after cervical cerclage as compared to 52.5% before surgery. There was an improvement in foetal salvage from 52% to 87.4% following cervical cerclage that can be favourably compared with other reports (¹⁴, 16, 17, 18, 19, 20, 21, 22). The overall foetal salvage rate for the study group was 1.68. This was similar to that achieved by Egwuatu in Nigeria (¹⁴).

We analysed our results with the aim of finding out some contributing factors for the failure of cervical cerclage. We sought a correlation of these results between time of insertion of cervical cerclage, maternal age, number of previous abortions and number of previous deliveries, etc.

Obviously it is possible to explain all contributory factors, however, some aspects came out quite clearly in our study. First of all, it was important to find out what the most suitable time was to insert a cervical cerclage. We observed relatively higher incidence of abortions (13.1% vs 2.5%) when cervical cerclage was in-

Table 4. — *Comparison of pregnancy outcome according to time of insertion of sutures (≤ 18 weeks and ≥ 19 weeks gestational age).*

Time of operation	Abortion	Premature	Mature
≤ 18 wks	17 (13.1%)	19 (14.7%)	93 (72%)
≥ 19 wks	2 (2.5%)*	10 (12.8%)	66 (84.6%)

* $p < 0.05$

served at ≤ 18 weeks gestation time. Successful outcome in this group was 86.8% as compared to 97.4% in the group where operations were performed after 19 weeks of pregnancy.

This means that in our study the best time for insertion of the cervical cerclage was after 18 weeks gestation time. Support for this time period has come from many authors ^(6, 23, 24) and especially from McDonald, who in 1957 found that his cerclage was most effective if performed between the 20th and 24th weeks.

This result is however in contrast with that published by Charles & Edwards ⁽²⁵⁾ who reported a better outcome when cerclage was inserted before 18 weeks gestation.

However, we can explain our results by a number of factors. In the abortion group we performed more emergency operations on patients with open cervixes and bulging membranes. Moreover, it was observed that in the group operated on ≤ 18 weeks there were more unexpected complications such as chorioamnionitis and draining in 60% which occurred 2 to 4 weeks after surgery. This confirmed the association between infection within

the uterus and uterine contractions that have been earlier reported ^(25, 26, 27, 28).

Two cases were complicated by early post-operation bleeding and abortion. Five patients aborted without any known reasons. A total of 17 out of 129 patients operated-on developed complications.

Among the 78 patients operated-on ≥ 19 weeks early draining was reported in two cases after surgery and abortion. Totally, two out of 78 operated-on developed complications contributing to a better outcome in this group. Only two out of 78 patients operated-on developed complications. Secondly, it was interesting to compare the outcome of pregnancies (abortions, premature and mature deliveries) after insertion of the cervical cerclage within the maternal age group (Table 5) with a number of previous abortions (Table 6) and a number of previous deliveries - parity (Table 7). We tried to analyse the likely prognosis in each group.

In the *group of post-operation abortions* a significant difference in the number of abortions related to parity. In the low parity group (0-2) the number abortions was higher compared to the multiparity group at the level $p = 0.07$. In our opi-

Table 5. — *Correlation outcome of pregnancy with maternal age.*

Age	Abortion	Premature	Mature
≤ 25	4 (21%)	8 (42%)	41 (24%)
26 - 30	8 (27.5%)	12 (41.5%)	50 (31%)
> 30	7 (26%)	9 (31%)	68 (43%)
Total	19	29	159

Table 6. — *Correlation outcome of pregnancy with number of previous abortions.*

No. of previous abortions	Abortion	Premature	Mature
0 - 2	8 (42%)	17 (59%)	112 (70.5%)*
> 2	11 (58%)	12 (41%)	47 (29.5%)
Total	19	29	159

* $p < 0.05$

nion the main contributing factors were early postoperative complications such as bleeding, uterine contractions, chorioamnionitis and ruptured membranes that occurred in the low parity group.

On the other hand, and surprisingly, there was no significant difference observed between the number of previous abortions and the number of abortions after surgery. This does not support our hypothesis that the possibility for abortion after cervical cerclage is correlated to the number of previous abortions. It might be due to the small amount of data used and needs further study. Indeed, the group of patients with habitual abortions received special attention – mainly for hospitalization and monitoring of uterine activity, etc.

Also, we found that maternal age did not contribute to postoperative outcome.

In the *group of premature deliveries* in the low parity group (0-2) the number of premature deliveries was significantly higher. We suspect that the difference might be due to the predisposition to premature delivery previously recorded in this group, but the percentage of premature deliveries

in the low parity group was smaller (27%) compared to the multiparous group (43%). This suggests that a previous predisposition to prematurity did not necessarily affect the current outcome.

In the low parity group the main reason for premature deliveries was uterine contractions. Additional complications like rupture of membranes, two cases of intra-uterine death, two HIV infections, one case of cholera infection, one case of triplets – contributed to premature deliveries. On the other hand, no significant differences were observed in relation to maternal age and number of previous abortions.

In the *group with mature deliveries* it should be emphasized that the possibility of having a baby in the group with previous abortions (0-2) was significantly higher – 70.5% as compared to 29.5% – than in the group with 3 or more previous abortions ($p < 0.05$).

Another important clinical observation was that the likelihood of having a mature baby was higher in the low parity group (0-2) than in multiparity. No significant differences were observed in relation to maternal age.

Table 7. — *Correlation outcome of pregnancy with number of previous deliveries (parity).*

Parity	Abortion	Premature	Mature
0 - 2	14 (74%)*	22 (76%)*	90 (57%)
> 2	5 (26%)	7 (24%)	69 (43%)
Total	19	29	159

* $p = 0.07$

As mentioned above, the most frequent complication in the group of abortions and premature deliveries was contractions of the uterus and rupture of membranes. Similar problems have been reported previously^(14, 25, 26). The association between infection of the genital tract and prematurity has been explained very clearly by Novy *et al.*⁽²⁶⁾. According to the authors, microbial factors play an important role in a large percentage of unexplained pre-term births. The role of ascending infections and prematurity has been raised previously in the literature by many other Authors. In our study the majority of abortions and premature deliveries were due to chorioamnionitis and ruptured membranes. HVS showed a presence of bacterial infection mostly due to *E. coli*, *Neiss. gonorrh.*, *Staph. aur.*, *Staph. epiderm.*, mixed with *Candida alb.*

It is my belief that our experience will help in the future to prevent abortions and prematurity in case of cervical incompetence through the use of cervical cerclage.

However, as quoted by Regan⁽²⁹⁾, this form of treatment does not improve pregnancy outcome significantly. So, the question is "to tie or not to tie?"

It is probable that many contributory factors are responsible for our success – for example, reduced physical activity, close antenatal cooperation, psychological aspects of the operation, help and cooperation of the husband.

We hope that our experience will prove of benefit and provide a fundamental basis for future development in the management of similar cases on the African Continent.

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Address reprint requests to:
M. WALOCH
Nkana Hospital
P.O. Box 21900 Kitwe (Zambia)