

## The Use of Total Cervical Occlusion along with McDonald Cerclage in Patients with Recurrent Miscarriage or Preterm Deliveries

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### Abstract

**Objectives:** To study the fetal outcome with the use of McDonald cerclage and total cervical occlusion in women with recurrent mid-trimester miscarriages or preterm deliveries, as well as complications of total cervical occlusion in the women.

**Methods:** Prospective descriptive observational study on patients with two or more mid-trimester miscarriages, deliveries before 36 weeks, or patients who have experienced failure of transvaginal cerclage.

**Results:** Twenty-six women were studied. Of these, 92% delivered at term. Two women delivered at 33 and 35 weeks, respectively. There was one neonatal death. Take home baby rate was 96.2%. There was no serious maternal morbidity among the patients.

**Conclusion:** The addition of external cervical OS occlusion to McDonald cerclage could improve fetal outcome in women with recurrent mid-trimester miscarriages and preterm deliveries.

**Keywords:** Total cervical occlusion; McDonald cerclage; Recurrent mid-trimester miscarriage; Preterm delivery.

### Introduction

Recurrent miscarriage is a distressful condition and recurrent mid-trimester miscarriage in particular is disturbing to physician and patient alike, because the loss is that of a normal fetus in advancing stages of gestation. This form of miscarriage and preterm births appear to have similar etiologies, which include cervical weakness and/or ascending infection.<sup>1,2,3,4,5</sup>

Cervical weakness is often over-diagnosed as a cause of mid-trimester miscarriage. There is also no satisfactory objective test that can identify women with cervical weakness in the non-pregnant state.<sup>6</sup> Even though transvaginal ultrasound assessment

of the cervix during pregnancy has been found to be useful in predicting preterm birth in some cases of suspected cervical weakness,<sup>3</sup> treatment of cervical incompetence with cervical cerclage may not actually result in improved perinatal survival.<sup>7,8</sup> Furthermore, meta analysis of trials on McDonald cerclage have failed to show a lower rate of preterm delivery before 28 and 34 weeks in women assigned to cervical cerclage.<sup>4,6</sup>

These body of evidence point to probably more than just cervical weakness as a cause of late trimester miscarriage and preterm births.<sup>8-11</sup> Ascending infection may be an important contributory factor to mid-trimester miscarriage and preterm delivery.<sup>9-11</sup> The evidence for this is the high frequency of finding organisms in the amniotic fluid which are also present in the vagina in patients with preterm labor.<sup>11-13</sup> Infection from the vagina may be as a result of loss of the protective cervical mucus plug (the operculum), which serves as an effective mechanical barrier between the vagina and the uterus and protects the fetomaternal unit from ascending infection during pregnancy.<sup>14,15</sup>

The essence of total cervical occlusion is to preserve the cervical mucus plug and prevent ascending infection and subsequent initiation of miscarriage and preterm birth. The use of cervical occlusion along with McDonald cerclage is presented in 26 patients in this study. Both procedures are simple and technically easy to perform.

### Methods

This is a prospective observational study conducted over a period of twenty months on all patients presenting with recurrent mid-trimester miscarriage or delivery before 36 weeks to a private obstetric facility that serves as a referral center for obstetric and gynecologic cases in Kaduna Nigeria between 1<sup>st</sup> April 2008 and 31<sup>st</sup> December 2009. Patients with two previous miscarriages in mid-trimester or preterm delivery who had agreed to participate in the trial between 1<sup>st</sup> April 2008 and 31<sup>st</sup> December 2009 were included in the study. Patients had a history of two consecutive mid-trimester miscarriages or delivery before 36 weeks, and patients who have previously had a McDonald's or Shirodkar's cerclage with suboptimal results. This is defined as delivery before 36 weeks gestation despite the cerclage.

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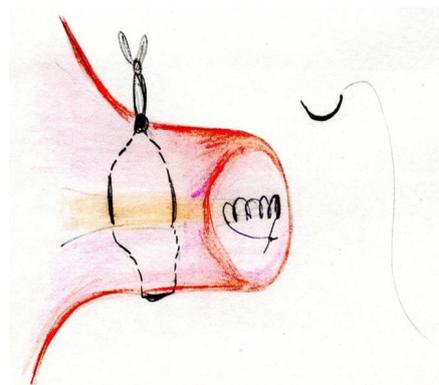
Diamond Specialist Hospital Kaduna. Nigeria.

The inclusion criteria was as follows: 1) At least two previous mid-trimester miscarriages from diagnosed or suspected cervical weakness; 2) Failed McDonalds or Shirodkar’s cerclage; 3) No medical complication in current pregnancy or previous pregnancies; 4) Singleton pregnancy with normal fetus on ultrasound scans; 5) Consent to participate in the study. While the exclusion criteria for this study included the following: 1) Vaginal discharge, ruptured or bulging membranes; 2) Medical disorder in current or previous pregnancy including HIV; 3) Bleeding in early pregnancy; and 4) Fetal anomaly.

Eligible patients had a transvaginal ultrasound scan done to confirm cervical length of less than 2.5 cm or internal OS diameter of 0.8 cm or more in the current pregnancy. A McDonald cerclage was performed with merselene tape under general anesthetic at the level of the internal cervical OS (as described by McDonalds),<sup>16</sup> and total external cervical OS occlusion was performed with nylon 2/0 or 3/0 ethicon suture on a curved needle between 13 and 16 weeks of gestation.

The cervical occlusion was placed transversely along the external cervical OS below the McDonalds suture to occlude external cervical OS using the anterior and posterior lips of the cervix with the nylon suture, (Fig. 1). The external cervical OS is totally occluded in continuous nylon suture starting from one end to the other. The suture was tied and left long enough to facilitate removal. Routine postoperative care using salbutamol and prophylactic antibiotics were given.

The patients were discharged as appropriate and routine antenatal care continued. At 37 weeks of gestation or with the onset of labor if earlier, both sutures were removed and the patients were allowed to deliver as appropriate. The maternal outcome in terms of infection, hemorrhage, trauma difficulty with removal or increased operative delivery and fetal outcome in terms of fetal weight and perinatal survival were observed and data is analyzed using simple frequency tables.



**Figure 1:** Diagram to show method of double cerclage. McDonald’s and total cervical occlusion.

**Results**

Twenty-six patients who fulfilled the criteria were followed up to the time of delivery. The age range of the patients was 23 to 36 years with a mean age of 26.8 years. The patients have had fetal wastage

of between two to eight with an average of four mid-trimester losses in the group. The profiles of the patients are presented in Tables 1 and 2.

Failed cervical cerclage in a previous pregnancy was observed in 6 out of 26 patients (23.8%). There were three patients who had more than one failed cervical cerclage, including one with three-failed cervical suture with subsequent fetal loss. However, there were no intra or postoperative complications in terms of hemorrhage, infection, or ruptured membranes. Though, one patient who was delivered by cesarean section presented with incompletely removed nylon suture two weeks after discharge.

In terms of the mode of delivery; 22 patients had normal vaginal delivery, while two patients had vacuum delivery and two had cesarean sections. The indications for the cesarean section were two previous cesarean sections in one patient, and poor progress in labor for the other patient. With regards to fetal outcome; 25 of the total 26 patients (96.2%) took their babies home. Overall, 24 (92.3%) patients delivered at term, while two patients delivered at 33 and 35 weeks respectively; one following spontaneous rupture of membranes at 33 weeks and the other with preterm labor at 35 weeks. The fetus delivered at thirty three weeks died after 48 hours from respiratory distress. This loss, 1 in 26 patients (3.8%) was the only fetal wastage observed. In this study, there was no extreme low birth weight as all the babies weighed greater than 1.5 kg. The baby delivered at 33 weeks weighed 1.9 kg. Over 80% of the patients had normal birth weight for the area of study.

**Table 1:** Age of Patients with Recurrent Miscarriage.

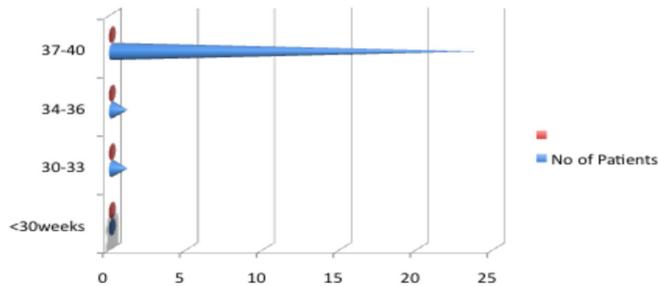
Age of Patients (years)	No of Patients (%)	Percentage
21-25	4	15.4
26-30	15	57.7
31-35	4	15.4
36-40	3	11.5
Total	26	100

**Table 2:** Number of Miscarriages Experienced by the Patients.

Number of miscarriages	No. of Miscarriages in Patients	Percentage
2-3	5	19.2
4-5	13	50.0
6-7	6	23.1
8+	2	7.7
Total	26	100.0



**Figure 2:** Fetal Outcome at Delivery.



**Figure 3:** Gestational age at time of delivery following use of McDonald with Cervical Occlusion.

## Discussion

The use of early total cervical occlusion (ETCO) was introduced in 1980 but has not been popularized until of recent, when ten countries participated in a randomized controlled trial to evaluate its effectiveness.<sup>17,18</sup> In this study, which is a prospective observational study of 26 patients who had both McDonald cerclage and early total cervical occlusion; there was only one delivery at 33 weeks and eventual fetal loss. The success rate of 96.2% is superior to 89% observed from performing a trans-abdominal cerclage.<sup>19,20</sup> This is especially important if the simplicity of the procedure and the ability of the patients to achieve normal delivery are taken into consideration. The observed cesarean section rate of 7.7% is in keeping with normal rate for the unit of 10%.

Furthermore, 23.8% of the patients reported here had failed transvaginal cerclage in their previous pregnancies, but subsequently delivered at term following the addition of total cervical occlusion to McDonald cerclage. There was no significant postoperative morbidity observed in this study, which is similar to the findings observed in studies involving larger numbers of patients.<sup>18</sup> Also, cervical scarring was not observed in any of the patients. If other studies continue to support these results, then the role of retaining the cervical mucus plug in preventing mid-trimester pregnancy loss and preterm delivery will be not only be substantiated, but two simple vaginal procedures could be used to improve pregnancy outcome.

## Conclusion

The addition of total cervical occlusion to transvaginal cerclage has improved fetal outcome in patients with recurrent pregnancy without increasing maternal morbidity or cesarean section rate.

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