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Cervical Cerclage in Combination with Oral Progesterone and Vaginal Ring Pessary for Preventing Recurrent Previable Births in Women with Prior Failed Cervical Cerclage: An Exploratory Prospective Case Series

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Abstract

Background: Recurrent previable births due to cervical insufficiency pose significant challenges, particularly after failed cerclage procedures.

Objectives: This case study evaluates a novel triple approach combining transvaginal cerclage, oral progesterone, and vaginal ring pessary in high-risk women with prior failed cerclage.

Methods: We conducted a prospective case series involving four women with recurrent previable births and previously failed cerclage at a tertiary centre in Nigeria between January 2024 and April 2025. Participants received transvaginal cervical cerclage between 10-13 weeks, followed by vaginal ring pessary ('Donut type') insertion two weeks later, and oral progesterone (dydrogesterone 10mg three times daily) until 28 weeks. The primary outcome was delivery beyond 34 weeks of gestation. Secondary outcomes included neonatal survival, birth weight, and maternal complications.

Results: Among the four participants (mean age 30.8 years, range 26-36), three (75%) delivered beyond 34 weeks of gestation (mean 35.2 weeks among those who delivered). Three had live births at term or late preterm (34weeks 1 day, 36weeks 3 days, and 37weeks 2 days) with favourable neonatal outcomes (birth weights 2.4kg, 3.1kg, and 2.7kg; APGAR scores 6/1, 9/1 and 9/1), while one experienced a previable birth at 26 weeks 1 day resulting in neonatal death. One maternal complication (cervical laceration) occurred that was successfully repaired.

Conclusion: This combined triplex approach appears feasible and potentially effective for high-risk women with recurrent previable births following failed cerclage. It may offer a less invasive alternative to open abdominal or laparoscopic cerclage, particularly valuable in resource-limited settings. These preliminary findings warrant validation through larger prospective or randomised controlled trials.

Keywords: Adjunctive support techniques, cervical insufficiency, preterm birth prevention, ring pessary, progesterone, maternal-fetal medicine.

Introduction

Cervical insufficiency is a leading cause of recurrent previable (<24 weeks) and preterm births, contributing

significantly to fetal morbidity and mortality [1]. Management strategies traditionally include cervical cerclage, which mechanically reinforces the cervix, and more recently, the vaginal pessary, which alters the uterocervical angle to reduce pressure on the internal os [2, 3]. Cerclage can be placed electively based on obstetric history, ultrasound findings, or in emergencies, while pessaries are inserted without anaesthesia and generally well-tolerated despite potential increases in vaginal discharge [2–5]. However, while both interventions individually show promise, their effectiveness varies, and studies investigating their combined use remain limited and inconclusive [6–8].

Recent trials have reported mixed results: one found no benefit of pessary alone as it did not reduce early preterm birth [6], while others reported significant reductions in spontaneous preterm birth rates with pessary use [7, 9]. A combined approach has shown potential; for instance, Ples et al. found that women treated with both cerclage and a vaginal pessary had the highest mean gestational age at delivery (38.33 weeks) compared to those treated with cerclage or a pessary alone [8]. The present report specifically focuses on women with recurrent previable births and prior failed cervical cerclage, a subgroup rarely studied in earlier works. In such high-risk patients, where single interventions have already proven insufficient, a combined strategy may be clinically justified [1, 10–13]. The rationale for incorporating oral progesterone alongside cerclage and pessary is based on its well-documented role in reducing uterine contractility and inflammation, complementing the mechanical support provided by the other two interventions. [10–13].

We acknowledge that evidence for this triple approach remains preliminary, and its application in our centre was exploratory rather than standardised practice. However, in low- and middle-income countries, where advanced laparoscopic or laparotomic cerclage may be inaccessible or unaffordable, such a multimodal, transvaginal strategy could provide a pragmatic alternative. Therefore, this case series determined the outcomes of women with recurrent previable births and prior failed cerclage, treated with a combination of transvaginal cervical cerclage, oral progesterone, and vaginal ring pessary.

Materials and Methods

Study design and participants: This case series was conducted at Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria, between January 2024 and April 2025. We enrolled consecutive eligible women attending the high-risk antenatal clinic with: (1) history of recurrent previable births (≥ 2 losses < 24 weeks), (2) at least one failed previous transvaginal cerclage, and (3) current singleton pregnancy < 14 weeks of gestation. We excluded women with multiple gestation, fetal anomalies, active vaginal bleeding, ruptured membranes, intrauterine infection, placenta previa, or active labour. Ethical approval was obtained from the Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria (approval number: NAUTH/CS/66/VOL.14/VER.3/06/2020/081), and written informed consent was obtained from each participant before enrollment. For clarity, "failed cerclage" in this study was defined as a previable delivery (< 24 weeks) despite a prior transvaginal cerclage. Specifically, two women had a history-indicated cerclage that failed, one had an ultrasound-indicated cerclage that failed, and one had an emergency cerclage that failed. The circumstances and timing of these failures varied but all resulted in pregnancy loss before fetal viability.

Procedure: At enrollment, each participant underwent a detailed clinical assessment, including obstetric ultrasonography to evaluate fetal viability, amniotic fluid volume, and cervical length. Baseline antenatal investigations: complete blood count, fasting blood glucose (where indicated), urinalysis, and infection screening (HIV, hepatitis B and C, syphilis) — were also performed. Transvaginal cervical cerclage was placed under spinal anaesthesia between 10 and 13 weeks of gestation, following standardised institutional protocols. Two weeks post-cerclage, a vaginal ring pessary ('Donut type') was inserted. The rationale for the two-week interval was based on clinical judgment, allowing for initial cervical healing post-cerclage before adding mechanical support with the pessary to minimise the risk of infection and trauma.

Oral progesterone (10 mg three times daily) was commenced immediately after cerclage placement and continued until 28 weeks of gestation or until earlier delivery if it occurred. Progesterone was used for its proven benefit in reducing the risk of spontaneous preterm birth in women with cervical insufficiency [3].

The cervical pessary was temporarily removed between 24 and 26 weeks of gestation during an outpatient visit, sterilized in a solution containing 0.5% Chlorhexidine gluconate and 0.5% Cetrimide, and reinserted within one hour. This temporary removal was performed to inspect for vaginal infection and maintain pessary hygiene without compromising cervical support. Patients were closely monitored with serial cervical length measurements obtained through transvaginal ultrasound and biweekly fetal non-stress tests (biophysical profiles). Tocolytic therapy with nifedipine retard (30 mg every 24 hours)

or salbutamol (4 mg every 12 hours) was initiated if uterine contractions were observed.

The removal of the cerclage and pessary was planned electively at 36–37 weeks of gestation in the absence of complications. However, removal occurred earlier if there were symptoms such as regular painful uterine contractions, rupture of membranes, or signs of intrauterine infection. In cases of spontaneous labour onset or suspected fetal distress, intrauterine resuscitation measures were instituted (maternal oxygenation, left lateral positioning, hydration). Emergency caesarean section was performed when indicated; otherwise, vaginal delivery was encouraged.

Postpartum care included administration of uterotonics (misoprostol, oxytocin infusion), tranexamic acid, and active management of the third stage of labour to prevent postpartum haemorrhage. Cervical inspection for lacerations and appropriate repairs were performed where necessary. Neonatal outcomes, including birth weight, Apgar scores at 1 and 5 minutes, and the need for admission to the neonatal intensive care unit (NICU), were documented. Maternal postpartum recovery was assessed by monitoring vital signs, uterine involution, and lochia. The definitions adhered to standard criteria: miscarriage was defined as pregnancy loss before 24 weeks of gestation [14], previable birth as birth before 24 weeks [14], and preterm birth as delivery between 24 weeks 0 day and 36 weeks6 days of gestation [14].

Results

Patient characteristics

This case series included four Nigerian women diagnosed with cervical insufficiency and recurrent previable births, all of whom had a history of failed cervical cerclage. The average maternal age was 30.75 years (range: 26–36 years). All pregnancies were spontaneously conceived and were desired. The patients had varied obstetric histories, including multiple second-trimester losses and coexisting medical conditions, such as fibroids and gestational diabetes mellitus.

Cervical cerclage was placed between 10- and 13-weeks' gestation, followed by cervical pessary insertion two weeks later. All patients received antenatal care with close maternal-fetal monitoring. Table 1 provides a summary of the baseline characteristics of the patients.

Table 1: Baseline patient characteristics

Case No.	Age (years)	Parity	History of Previable Births	Gestational Age at Cerclage	Previous Failed Cerclage	Antenatal Booking (Weeks)	BMI (kg/m²)	Relevant Comorbidities
1	29	$G8P4^{+3}$ (Alive 3)	3 consecutive second-trimester losses	12 weeks	Yes	8 weeks	26.9 (75 kg/167 cm)	None
2	36	$G8P2^{+5}$ (Alive 2)	5 previable births (3 consecutive losses)	10 weeks 3 days	Yes	8 weeks	32.9 (95 kg/170 cm)	None
3	32	$G4P1^{+2}$ (Alive 1)	2 previable births	13 weeks 3 days (emergency cerclage)	Yes	5 weeks	37.5 (102 kg/165 cm)	Gestational Diabetes Mellitus
4	26	$G3P0^{+2}$ (Alive 0)	2 previable births	12 weeks 3 days	Yes	6 weeks	26.9 (75 kg/167 cm)	None

Procedural details

Cervical cerclage was performed transvaginally under spinal anaesthesia according to institutional protocols. Vaginal ring pessary insertion was performed two weeks after cerclage placement based on clinical judgment, aiming to provide additional mechanical support during cervical healing (Figure 1).

Post insertion, patients were monitored with serial ultrasound evaluations and cervical assessments. Tocolytic therapy with nifedipine retard (30 mg once daily) or oral salbutamol (4 mg twice daily) was administered when signs of preterm labour appeared. Oral progesterone (dydrogesterone 10 mg three times daily) was continued until 28 weeks' gestation. The pessary and cerclage were electively removed at the onset of labour or at 36–37 weeks, unless preterm labour or membrane rupture necessitated earlier removal.

Detailed individual case summaries

Case one:

The pregnancy remained uneventful until 34 weeks, when the patient developed signs of preterm labour. Following pessary and cerclage removal, spontaneous vaginal delivery occurred after intrauterine resuscitation for fetal distress. A female neonate weighing 2.4 kg was delivered (APGAR 6 at 1 min, 9 at 5 min). A cervical laceration was sustained during delivery and repaired successfully. The neonate was admitted to the NICU for observation, and both mother and baby were discharged in stable condition.

Case two:

This patient developed preterm premature rupture of membranes (PPROM) at 26 weeks and the cerclage and ring pessary were removed. She later had a spontanous vaginal delivery of a male neonate weighing 0.6 kg. Unfortunately, the neonate died within 24 hours. The mother recovered well and was discharged 48 hours postpartum following counselling.

Case three:

In this case, complicated by gestational diabetes mellitus, an elective Caesarean section was performed at 36 weeks and 3 days. The decision for caesarean delivery was based on poor glycaemic control despite dietary and pharmacological measures, with associated concerns about macrosomia and maternal risks, rather than any direct complication from the cerclage or ring pessary. A male neonate weighing 3.1 kg (APGAR 9/10) was delivered without complications and the pessary and cerclage were removed at the end of the surgery. Both mother and neonate were discharged in good health after 48 hours.

Case four:

This patient was a 26-year-old ($G3P0^{+2}$, Alive 0) with two prior previable births and one failed history-indicated cerclage. She underwent cerclage placement at 12 weeks and 3 days in the current pregnancy. She had no co-morbidities, with a BMI of 26.9 (75 kg/167 cm). The pregnancy was carried to term, had spontaneous onset of labour at 37 weeks plus 1 day and she delivered at 37 weeks plus 2 days of gestation via spontaneous vaginal delivery. The neonate weighed 2.7 kg and was discharged in good health alongside the mother.

Pregnancy and neonatal outcomes

The clinical courses and outcomes are summarised in Table 2.

Table 2: Pregnancy and Neonatal Outcomes

Case	Gestational Age at Delivery	Presentation	Delivery Mode	Neonatal Outcome	Maternal Outcome
1	34weeks 1 day	Cephalic, fetal distress	Spontaneous vaginal	Female, 2.4 kg, APGAR 6/1; 10/5	Cervical laceration repaired, discharged in stable condition
2	26weeks 1 day	PPROM, previable (preterm) delivery	Spontaneous vaginal	Male, 0.6 kg, died in 24 hours	Discharged 48 hours postpartum
3	36weeks 3 days	Diabetes in pregnancy	Elective caesarean section	Male, 3.1 kg, APGAR 9/1	Stable, discharged after 48 hours
4	37weeks 2 days	Cephalic	Spontaneous vaginal	Female, 2.7 kg, APGAR 9/1	Discharged 48 hours postpartum

Figure 1: Ring pessary ('Donut type') inserted transvaginally during the intervention.

Discussion

In this article, we provided a comprehensive overview and analysis of the obstetric course and clinical outcomes for four cases with prior recurrent previable births caused by cervical insufficiency and with history of failed transvaginal cerclage, treated with a novel combined technique of transvaginal cervical cerclage, oral progesterone, and vaginal ring pessary placement. All the cases had previous histories of unsuccessful transvaginal cervical cerclage procedures. Of the four cases, three resulted in favourable obstetric outcomes without complications, with each lasting at least 34 weeks of gestation. Cervical cerclage has been a fundamental approach to managing cervical insufficiency for over six decades [15, 16]. The combination technique appears to be a promising alternative to more invasive procedures, such as transabdominal cerclage, in resource-limited settings.

It is important to acknowledge the inherent limitations of this report. First, the small number of cases restricts the generalisability of the findings. Case series, by nature, provide lower levels of evidence and are susceptible to overestimating treatment effects. Second, there is a potential for selection bias; patients included may not be representative of the wider population with cervical insufficiency, and the choice to employ combined therapy may have been influenced by clinical judgment in more severe cases. Third, the absence of a comparator group, such as those managed with cerclage alone, limits the ability to attribute the observed outcomes to the combined intervention directly. Without a control arm, it is difficult to ascertain whether similar improvements could have occurred with standard care. Additionally, the possibility that spontaneous improvement might have occurred without the adjunctive interventions cannot be excluded.

Despite these limitations, this study has several strengths. First, it addresses a significant clinical challenge, managing women with recurrent previable births after failed cerclage, for which limited evidence exists. Second, the prospective design with a standardised intervention protocol enhances internal validity. Third, it provides preliminary data on a potentially less invasive alternative to transabdominal cerclage for high-risk women.

Furthermore, our findings contribute to the limited literature on the adjunctive use of pessary and progesterone alongside cerclage in women with previously failed cervical cerclage. Previous studies, such as the randomised controlled trial by Moshfeghi et al., did not demonstrate a significant benefit of adjunctive pessary following cerclage placement [17]. Similarly, a retrospective analysis by Shor et al. across three tertiary medical centres showed that combining cerclage, pessary, and progesterone

produced perinatal outcomes comparable to those of other therapies, even though women receiving the combined treatment had shorter cervical lengths at recruitment [18]. These studies highlight the ongoing uncertainty about the incremental benefit of adjunctive pessary use in this context. Cerclage was performed at 10 weeks and 3 days in one case, despite the absence of aneuploidy screening.

Beyond transvaginal methods, laparoscopic cervico-isthmic cerclage, using a port-site closure device to facilitate precise suture placement, provides a minimally invasive alternative for patients with recurrent failure of transvaginal cerclage [19]. Although this approach is promising, its availability may be limited in low-resource settings, thereby justifying the continued importance of simpler combination strategies such as the one explored here.

The mechanical and biological mechanisms through which pessaries may help prolong pregnancy including cervical support, redistribution of intra-abdominal pressure, uterine repositioning, reduction of mechanical load and uterine contractions, and modulation of the local cervical environment, have been postulated [20-23]. Nonetheless, these theoretical benefits require further validation through rigorous studies. One of the patients in our series experienced preterm birth following PPROM, consistent with previous meta-analyses suggesting that while cerclage decreases preterm birth and fetal loss rates, it does not appear to decrease the risk of chorioamnionitis or membrane rupture [24-26], although the evidence remains of low quality due to a lack of randomised trials [26].

Future directions should therefore focus on more robust study designs. A multicenter prospective cohort study, or preferably, a randomised controlled trial comparing the combination of transvaginal cerclage, progesterone, and pessary against cerclage alone, would be critical to validate the efficacy and safety of this approach. Such studies should include larger samples, more extended follow-up periods, and a comprehensive assessment of both maternal and neonatal outcomes. These studies would also allow for a more precise evaluation of potential confounding factors and spontaneous outcomes, thereby addressing the current gaps in evidence. Given the possible impact on global maternal-fetal health, particularly in low- and middle-income countries (LMICS), international collaboration would strengthen future research

Conclusions

The combined approach of transvaginal cervical cerclage, oral progesterone, and vaginal ring pessary placement described in this article may offer a practical management option for cervical insufficiency in pregnant women with a history of recurrent previable births and failed prior cerclages, particularly in low- and middle-income settings where access to advanced surgical options is limited. While the outcomes observed in this small case series are encouraging, they should be interpreted with caution given the study's inherent limitations. Further prospective, multicenter cohort studies or randomised controlled trials are necessary to validate the efficacy and safety of this combined intervention and to determine its role relative to standard treatment approaches.

Informed Consent Statement: Written informed consent has been obtained from the patient(s) to publish this paper.

Data availability statement:

Data sharing is not applicable to this article as no datasets were generated or analysed during this study.

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Conflict of interests:

The authors declare that there is no conflict of interest in this work.

Ethical consideration

Consent was obtained from the index patients to allow the reporting and displaying of pictures where necessary.

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Author Contributions

GUE and ICU conceived, supervised the study and performed the surgery; OKN, CGO, and EUN analyzed data; GUE, CU, ECE, AVE, CCO, CCO2, DUN, HCN and CCE wrote the manuscript; GUE, TKN, CCA, ICU, OZI, EOU, JII, GOU, COE, SCE, CCM, CBO and ACE made manuscript revisions. All authors reviewed the results and approved the final version of the manuscript.

Ethics approval and consent to participate

Ethical approval was obtained from the Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria (approval number: NAUTH/CS/66/VOL.14/VER.3/06/2020/081), and written informed consent was obtained from each participant before enrollment.

Consent for publication

Written informed consent was obtained from the index patient to publish this case report and any image which accompanied it.

Abbreviations

The following abbreviations are used in this manuscript:

NAUTH	Nnamdi Azikiwe University Teaching Hospital
HIV	Human Immunodeficiency Virus
PPROM	Preterm prelabour rupture of membranes
LMICS	Low- and middle-income countries (LMICS)

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