CASE REPORT

Double cervical cerclage for cervical insufficiency: Case report

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Abstract

Recurrent pregnancy loss devastates parents and frustrates doctors, especially when the pregnancy progresses to the second trimester. Cervical insufficiency is the most common cause of second–trimester pregnancy loss. Abdominal cerclage is the treatment option for women with failed vaginally applied cervical cerclage. We report a 33-year-old para 0 with a history of nine second-trimester pregnancy losses. She had six failed transvaginal cerclages using McDonald's procedure. A vaginal double cervical cerclage was placed in her index pregnancy. Two mersilene tape purse-string sutures were placed in the submucosal layer of the cervix; the first 1cm below and the second at the level of the internal os. Both sutures were knotted at the 12 O'Clock position on the cervix. She carried her pregnancy to almost term and delivered a healthy baby girl weighing 2.5kg. We recommend a transvaginal double cervical cerclage with mersilene tape using a modified McDonald's technique as a viable alternative to abdominal cervical cerclage. *(Afr J Reprod Health 2024; 28 [6]: 117-125).*

Keywords: : Double cervical cerclage, 'McDonald's technique, transvaginal cerclage, mid-trimester pregnancy loss, Ghana

Résumé

Les fausses couches récurrentes sont dévastatrices pour les parents et frustrent les médecins, surtout lorsque la grossesse progresse jusqu'au deuxième trimestre. L'insuffisance cervicale est la cause la plus fréquente de fausse couche au deuxième trimestre. Le cerclage abdominal est l'option de traitement pour les femmes dont le cerclage cervical appliqué par voie vaginale a échoué. Nous rapportons une para 0 de 33 ans avec des antécédents de neuf fausses couches au deuxième trimestre. Elle a eu six cerclages transvaginaux selon la procédure McDonald's qui ont échoué. Un double cerclage vaginal vaginal a été placé lors de sa grossesse index. Deux fils de suture en bourse en ruban de mersilène ont été placés dans la couche sous-muqueuse du col de l'utérus ; le premier 1cm en dessous et le second au niveau de l'os interne. Les deux sutures ont été nouées à la position 12 heures sur le col. Elle a mené sa grossesse presque à terme et a donné naissance à une petite fille en bonne santé pesant 2,5 kg. Nous recommandons un double cerclage cervical transvaginal avec du ruban de mersilène en utilisant une technique McDonald's modifiée comme alternative viable au cerclage cervical abdominal. *(Afr J Reprod Health 2024; 28 [6]: 117-125).*

Mots-clés: Double cerclage cervical, technique de McDonald's, cerclage transvaginal, fausse couche au milieu du trimestre, Ghana

Introduction

The failure of the cervix to retain an intrauterine pregnancy to term is termed cervical insufficiency. Its true incidence is challenging to determine, especially in developing countries, because of the lack of good data and clear diagnostic criteria. However, it is estimated to complicate 1% of all pregnancies and up to about 8% of pregnancies with a history of second-trimester pregnancy loss or preterm delivery[1].

Cervical insufficiency is a cause of pre-viability pregnancy loss, recurrent pregnancy loss and preterm delivery[2]. These exert significant psychosocial and economic impacts on the affected individual and the national health system. Over 70% of perinatal mortalities are associated with prematurity, mainly from breathing and feeding

difficulties, poor temperature control and infections. Up to about 85% of survivors suffer long-term developmental impairments[3]. The impact of preterm delivery is most severe in developing countries because of inadequate facilities and the expertise required to improve the survival of preterm babies and reduce their life-long complications.

The prevention of the traumatic experiences of recurrent fetal wastage, prematurity and its complications is a significant challenge in obstetrics and gynaecology practice. The most effective management of cervical insufficiency is with cervical cerclage[4]. Some studies have suggested that it is ineffective among blacks[5]. However, recents studies in Nigeria showed success rates of 71.2 – 74.8% among patients who received a history indicated cervical cerclage, 77.2% of these deliveries were at term[1,6].

Cervical cerclage is commonly placed vaginally[7]. Patients and doctors can be frustrated when vaginal cervical cerclage fails to prevent fetal losses. In such cases, abdominal cervical cerclage is the last resort. However, few obstetricians, especially in sub-Saharan Africa, are familiar with the abdominal approach to cervical cerclage.
Moreover, it is invasive, with an increased risk of bleeding compared to the transvaginal procedure[7]. A vaginally placed double cervical cerclage with mersilene tape may be a cheaper, easier, safer, simpler, and equally effective alternative to abdominal cervical cerclage. We present a case of transvaginal double cervical cerclage after six failed transvaginal single cervical cerclages to document its effectiveness as a possible first-choice alternative for abdominal cervical cerclage.

Case report

A 33-year-old G10 P0 + 9 presented with a history of nine second-trimester miscarriages. She was offered McDonald's cervical cerclage in her last six pregnancies. However, she lost all pregnancies in the late second trimester due to cervical insufficiency.

She presented to the antenatal clinic of Komfo Anokye Teaching Hospital (KATH) with the index pregnancy at 11 weeks + 0 days gestation. Apart from the complaint of early morning sickness, she was well. She did not have vaginal discharge and had never been treated for pelvic infections. There was no history of gynecological procedures. Her examination findings were unremarkable. A sterile Cusco's speculum examination revealed a normal-length cervix; the os was closed.

Her remaining antenatal care was conducted as per standard protocols. She was counseled for repeat elective vaginal cervical cerclage, using double mersilene tapes at 12 – 14 weeks gestation. She was initially skeptical because of the previous unsuccessful outcomes of similar procedures but finally consented. Her baseline antenatal investigations and the high vaginal and endocervical swabs were normal. A pelvic ultrasound scan confirmed a live fetus before the procedure.

Vaginal double cervical cerclage

At 13 weeks + 2 days gestation, vaginal double cervical cerclage was done with two mersilene tapes using a modification of the McDonald's procedure.
The patient was placed in lithotomy position. Routine theatre safety protocols and antiseptic standard operative procedures (SOPs) were observed. General anaesthesia was given. A Sim's speculum was inserted into the vagina to expose the cervix. The cervix and the vagina looked healthy. The cervical length was about 3cm, and the os was closed. There was no discharge or bleeding from the cervical os.

The anterior and posterior lips of the cervix were held with two pairs of sponge-holding forceps. The cervix was drawn outwards for full exposure. The vesico – cervical junction corresponding approximately to the level of the internal os was identified. The cervix was kept in position and under slight tension. The vaginal wall was retracted by an assistant using a Sim's speculum. With the round-bodied needle of mersilene tape mounted on a needle holder, a bite was taken into the cervical tissue submucosally between 12 and 9 o'clock positions, about 1 cm below the vesico – cervical junction. Similar bites were repeated between 9 and 6 o'clock, 6 and 3 o'clock and finally 3 and 12 o'clock positions circumferentially to complete a purse-string (Figure. 1a) A knot was made at the 12 o'clock position,

Figure 1a: A bite taken into the cervical tissue submucosally between 12 and 9 o'clock positions with a round-bodied mersilene tape mounted on a needle holder, about 1 cm below the vesico–cervical junction. Similar bites were repeated between 9 and 6 o'clock, 6 and 3 o'clock and finally, 3 and 12 o'clock positions circumferentially to complete a purse-string.

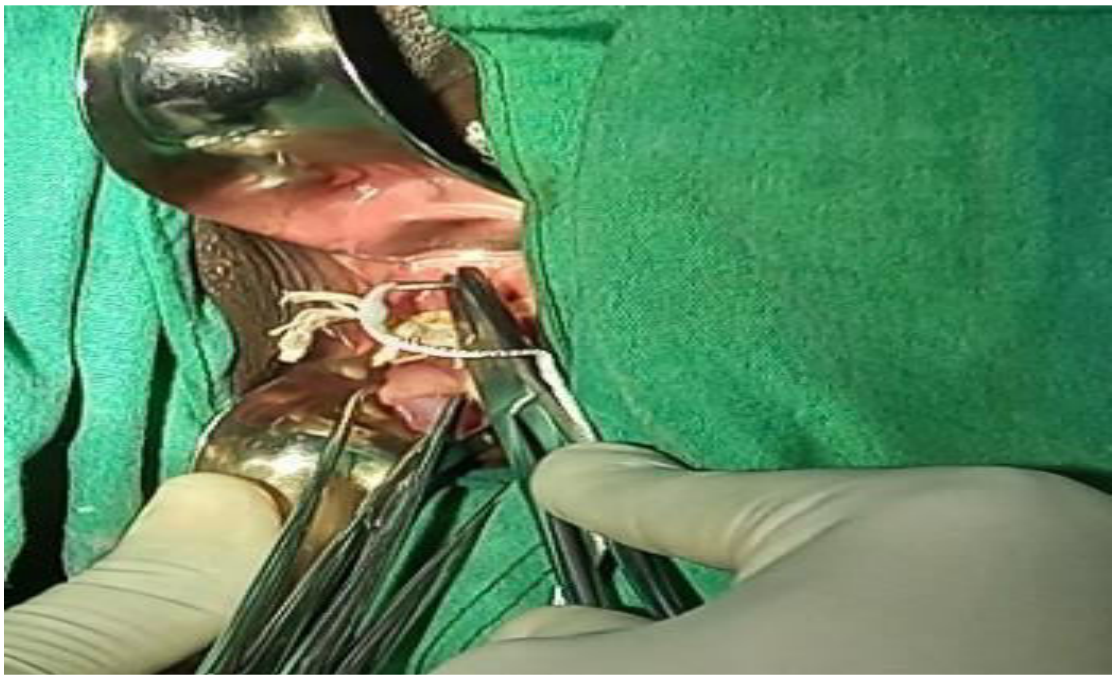

Figure 1b: A knot made at the 12 o'clock position, ensuring the cervical canal closed

Figure 1c: The procedure was repeated with a second mersilene tape at the vesico – cervical junction

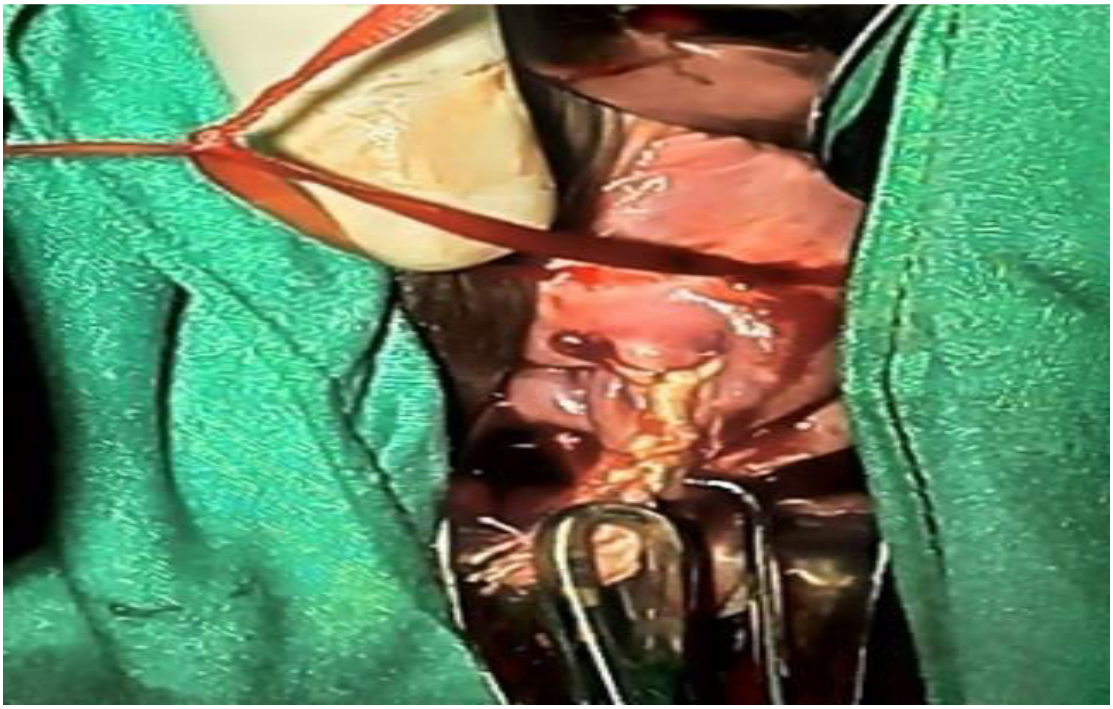

Figure 1d: The procedure was repeated with a second mersilene tape at the vesico – cervical junction

ensuring the cervical canal closed (Figure. 1b). The procedure was repeated with a second mersilene tape at the vesico – cervical junction (Figures 1c – 1g). The sutures left after making the knots were cut, leaving two loose snugs of about 3cm for easy identification (Figure 1h). After removing the

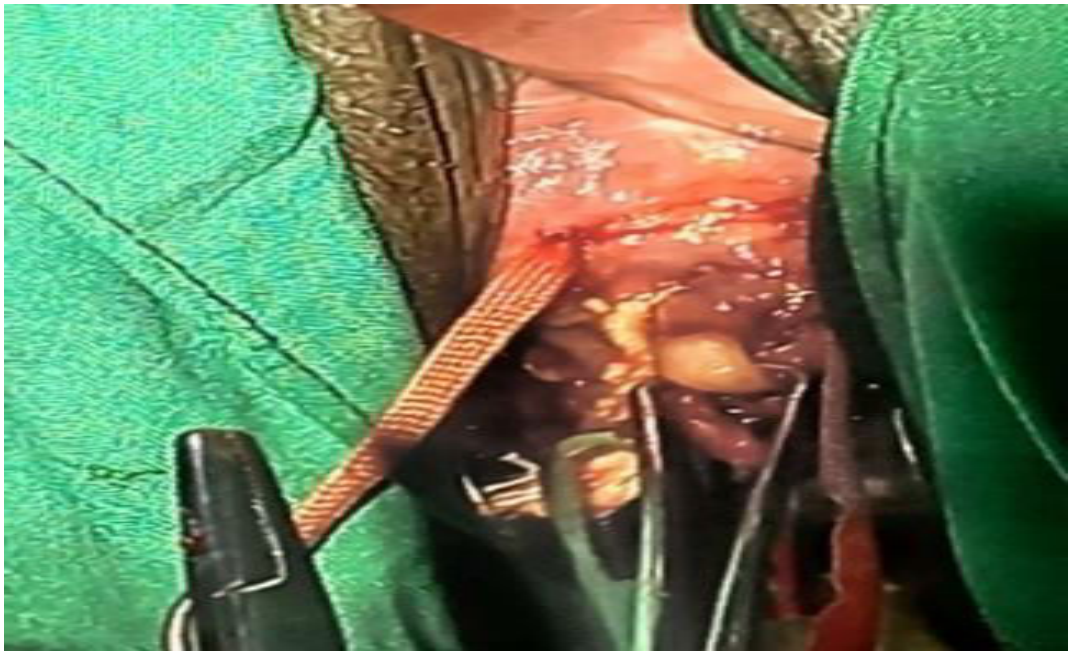

Figure 1e: The procedure was repeated with a second mersilene tape at the vesico – cervical junction

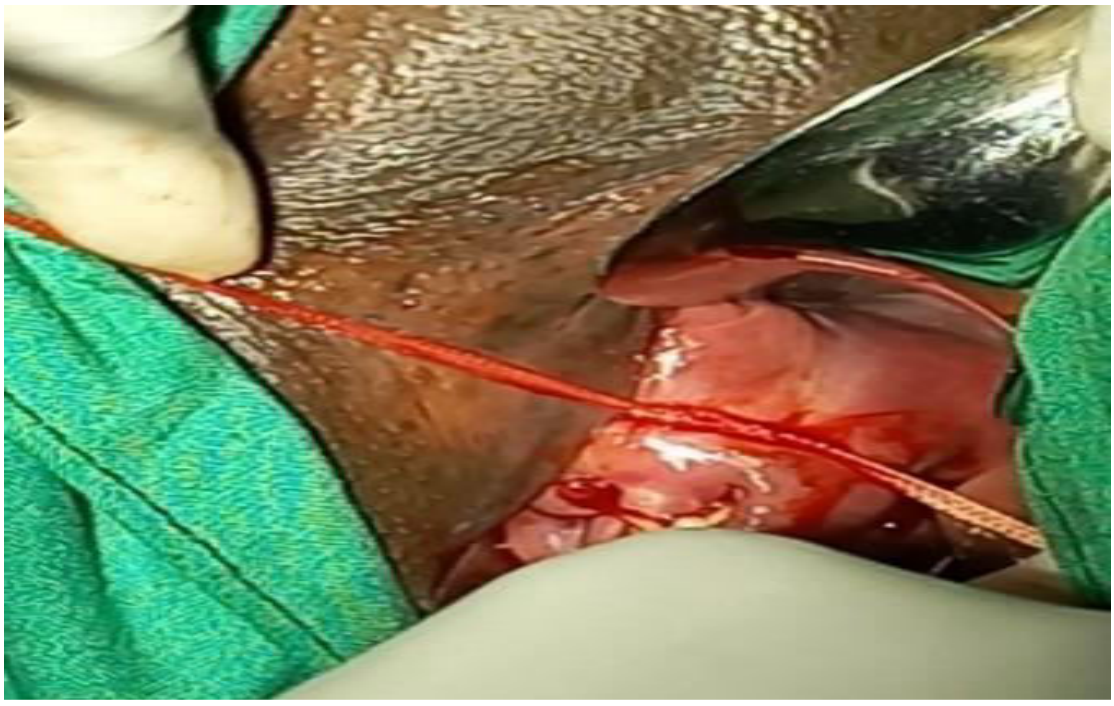

Figure 1f: The procedure was repeated with a second mersilene tape at the vesico – cervical junction

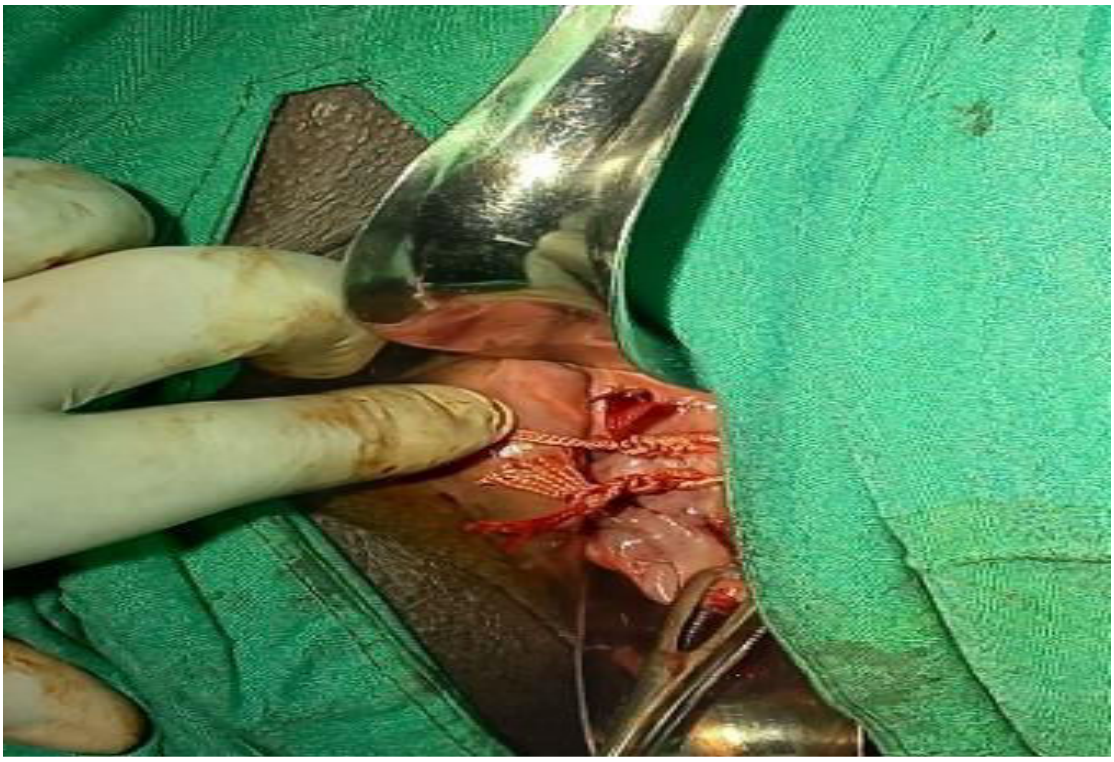

Figure 1g: The procedure was repeated with a second mersilene tape at the vesico – cervical junction

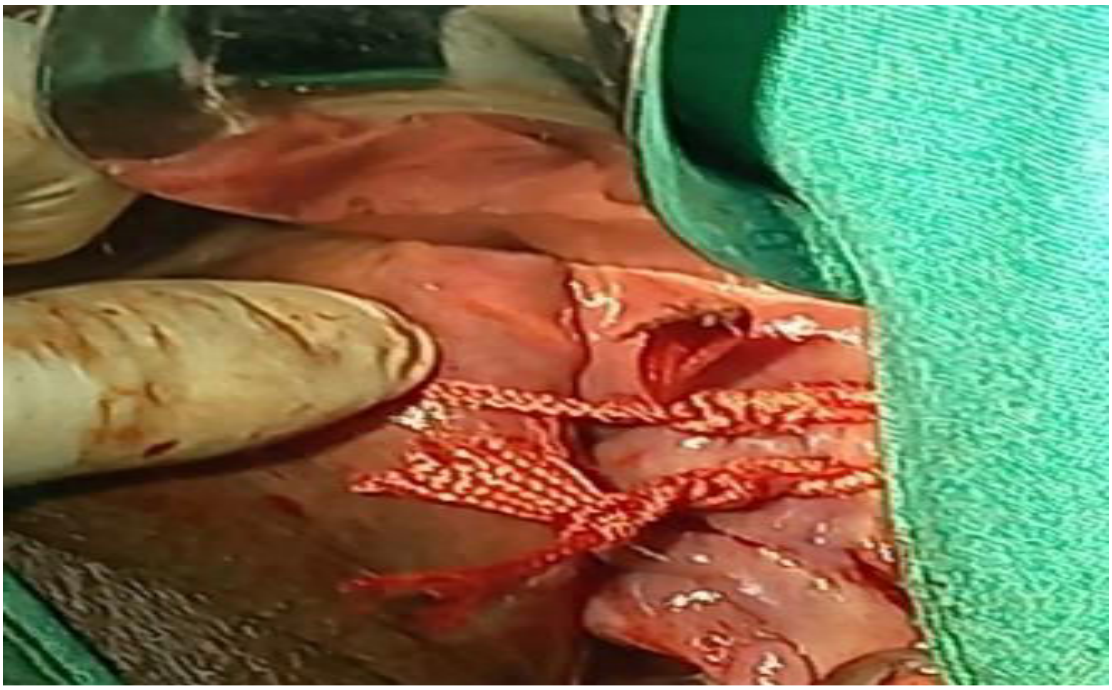

Figure 1h: The sutures left after making the knots were cut, leaving two loose snugs of about 3cm for easy identification

sponge holding forceps, the cervix was inspected for bleeding or loss of liquor which did not occur. The vagina was cleaned and Sim's speculum was removed. The bladder was catheterized to exclude bladder injury. A vulva pad was applied.

The patient was transferred from the theatre to the recovery ward bed, placed in the recovery position, and made warm. Her immediate post-op SPO_2 was checked and oxygen supplementation was given via nasal prongs depending on the requirements.

Appropriate documentation of the procedure and formal handing over to the theatre recievery staff was done. Her SPO_2, Blood Pressure (BP), Continuous Electrocardiogram (ECG), and Temperature were monitored every 15 minutes up to 2 hours after she fully recovered from anaesthesia. The post-operative recovery was uneventful. She was discharged home only after she became alert, well-oriented in place, time and person and able to walk without support. She passed urine and it was clear. There was no bleeding from the vagina. She did not complain of significant pain.

She was counselled on coital abstinence throughout the pregnancy. She was discharged on oral paracetamol 1g 8 hourly for two days and Augmentin 1g (875mg amoxicillin + 125mg clavulanic acid) 12 hourly for five days, with a scheduled appointment in two weeks.

She reported for review as scheduled. She had no complaints. Her general and obstetric examinations were normal. She was asked to continue her routine haematinics and antenatal care. The rest of the antenatal period remained uneventful. She received antenatal corticosteroids at 30 weeks gestation. Her haemoglobin concentration at 36 weeks' gestation was 11.0g/dl. A third-trimester obstetric scan at 36 'weeks' gestation was normal, with an estimated fetal weight of 2.30kg.

Removal of the cerclages was scheduled for 37 completed weeks' gestation. However, at 36 weeks + 6 days' gestation the patient had a premature rupture of membranes followed almost immediately by intermittent lower abdominal pains. She reported to the labour ward, where the cervical cerclages were removed. Labour progressed normally, resulting in the vaginal delivery of a 2.5kg female with Apgar scores 8/10 in the first minute and 9/10 after 5 minutes. The puerperium was normal. Her postnatal care was conducted as per standard procedures. She was counselled on the need for early booking in subsequent pregnancies and a possible repeat of vaginal double cervical cerclages.

Discussion

The commonest cause of spontaneous second-trimester miscarriage is cervical insufficiency. It is defined as the inability of the uterine cervix to retain a pregnancy without uterine contractions[4,8,9]. It is attributable to weaknesses in the intrinsic structure and processes driving premature effacement and dilatation of the cervix[10]. Acquired risk factors for cervical insufficiency are obstetric trauma from prolonged second stage of labour, precipitate delivery, operative vaginal delivery, and cervical laceration. Others are cervical conization, loop electrosurgical excision procedures and traumatic dilatation of the cervix for termination of pregnancy[4]. In utero exposure to diethylstilbestrol and congenital Mullerian anomalies such as bicornuate or septate uterus and uterine didelphys have also been associated with cervical insufficiency[4,7,9]. We found no obvious risk factors in our case.

Diagnosing cervical insufficiency is notoriously tricky and lacks definitive tests and objectivity[3,9,11]. Therefore, the diagnosis is usually made clinically and in retrospect, typically when the woman has a history of recurrent second-trimester miscarriages and/or early preterm deliveries. It is, however, not necessary to wait for recurrent second-trimester miscarriages or preterm deliveries to occur before a diagnosis is made. One second-trimester miscarriage with the classical features (painless cervical dilation with subsequent expulsion of the fetus without uterine contractions and in the absence of other evident pathologies, e.g., bleeding, infection, ruptured membranes) and the presence of risk factors is enough for a diagnosis[3,9]. The diagnosis of cervical insufficiency can be confirmed outside pregnancy by the demonstration of cervical funnelling on hysterosalpingography at hysteroscopy or the passage, without resistance, of

the number 9 Hegar dilator through the internal cervical os. However, the clinical usefulness of these tests is doubtful[3,12].

The treatment for cervical insufficiency is cervical cerclage. Two transvaginal cervical cerclage methods were first described in 1955 and 1957 by Vithal Nagesh Shirodkar and Ian McDonald. Based on clinical indication, cervical cerclage can be classified as an elective (with previous history or investigation findings), selective (with evidence obtained by ultrasound examination that shows shortening of the cervix), or an emergency (when the cervix is dilated with the membranes seen or bulging via the cervical os). In women identified as being at high risk by virtue of their past obstetric history, an elective procedure is performed around 12–14 weeks gestation after excluding gross fetal anomalies with an ultrasound scan. The wait allows enough time for pregnancies that abort spontaneously due to chromosomal abnormalities[7,8,13].

The cervical cerclage could be placed through vaginal or abdominal routes. The transabdominal cervical cerclage is reserved for women with a history of failed vaginally placed cervical cerclage or evidence of a very short or scarred cervix. Transvaginal cervical cerclage is commonly placed using a modification of the Shirodkar or McDonald techniques[8]. The Shirodkar technique is more invasive and involves a circular incision around the level of the internal cervical os, dissection of the bladder, and placement of circular suture (usually mersilene tape or nylon) in the region of the internal os or lower uterine segment. The incision wound is then sutured. The suture removal requires another operation[7,12]. The McDonald's procedure is much simpler, typically involving the placement of a single purse-string suture at the level of the internal os vaginally[7,12].

Our case had had many failed single cerclages with McDonald's technique, and a transabdominal procedure was indicated[11,14,15]. A transabdominal cerclage will require the expertise and laparoscopy or laparotomy, which are more invasive and expensive than a vaginal approach. A double vaginally placed cervical cerclage was therefore considered. Earlier studies on the efficacy of double-cervical cerclage showed no benefit over the single vaginally placed or abdominal cervical cerclage[16]. It is, therefore, not a first line treatment option for refractory cervical insufficiency[4].

Our case had an elective vaginally placed double cervical cerclage at 13 weeks + 2 days after ultrasound confirmation of a live fetus without gross anomalies. A modification of the McDonald's procedure was preferred because it is simpler to perform, is associated with less maternal morbidity, and has similar success rates compared to the Shirodkar procedure[7,8,13]. It is the preferred method at the authors' centre. A vaginal double cervical cerclage using mersilene tape and a modified McDonald's technique was performed instead of the recommended abdominal cervical cerclage because the expertise and the technology for the latter were not available at the author's centre. Moreover, some recent studies found some evidence that in patients with a history of transvaginal cervical cerclage failure, the addition of a transvaginal cerclage to the abdominally placed cerclage offers better cervical support, resulting in longer duration and better perinatal outcomes.. The women who were treated with the double cervical cerclage had longer mean gestational age at the time of birth (36 ± 1.83) compared to those who had a single vaginal cerclage (35.6 ± 1.14).[17,18]. The sample size for this study was, however, very small. With the transvaginal double cervical cerclage, our patient, who had never taken any of her previous nine pregnancies beyond 26 weeks gestation, could deliver only a day short of term.

The content of this report is limited in its generalizability. It represents the characteristics and experiences of this individual that may not be the same as those of the general population. Her account of events may be biased and inaccurate, reflecting her perceptions and individual experiences. A study involving a large proportion of the population of Kumasi or Ghana will provide robust and reliable data that would inform practice, especially in developing countries countries where the expertise and technology for abdominal cervical cerclage are inadequate.

Conclusion

For women with a history of failure after McDonal's cervical cerclage, a vaginal double cervical cerclage would be a cheaper, easier, safer, and equally effective alternative to a transabdominal cervical cerclage. Randomized control trials are required in sub-Saharan Africa to provide more robust evidence.

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Authors' contributions

Conception of the case report
Francis J.M.K. Damalie, Charles M. Senaya, Edward T. Dassah, Roderick Larsen-Reindorf
Placement of double cervical cerclage
Francis J.M.K. Damalie, Charles M. Senaya, Roderick Larsen-Reindorf
Antenatal Management
Francis J.M.K. Damalie, Emmanuel Ameyaw, Thomas O. Konney, Gerald O. Asubonteng
Labour management, postnatal and neonatal care
Emmanuel Ameyaw, Thomas O. Konney, Gerald O. Asubonteng
Manuscript writing
Francis J.M.K. Damalie, Charles M. Senaya, Edward T. Dassah, Roderick Larsen-Reindorf
All authors read and approved the final manuscript.

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