

## Successful outcome of modified Shirodkar cerclage in a patient with a history of failed vaginal cerclage: A case report

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### ABSTRACT

Cervical insufficiency is an important cause of bad obstetrics history and is preventable. McDonald's cervical cerclage has been used in obstetrics for a long era to prevent pre-term births. However, there are cases of failed cervical cerclages and then the dilemma arises whether to opt for another vaginal cerclage or a transabdominal cerclage. Each route of cerclage has its own advantages as well as shortcomings, making decisions difficult for clinicians as well as patients. We present the case of a 22-year-old female with previously failed McDonald cervical cerclage who opted for modified Shirodkar cerclage and had a good outcome. This case highlights the benefit of modified Shirodkar cerclage in cases of previously failed cervical cerclages.

**Key words:** Cervical incompetence, McDonald cerclage, Shirodkar cerclage, Transabdominal cerclage

Cervical insufficiency is the inability of the uterine cervix to retain a pregnancy in the absence of the signs and symptoms of clinical contractions, labor, or both, typically occurring in the second trimester [1]. It causes recurrent second-trimester abortions or pre-term vaginal deliveries and accounts for roughly 1% of pregnancies [2]. It is an important cause of bad obstetric history, but is treatable with cerclage. Cervical cerclage is the primary intervention for managing cervical insufficiency. Cerclage was first introduced by Shirodkar in 1955. His initial method involved complex surgical dissection. In 1957, McDonald proposed a simpler alternative, placing the suture higher on the cervix without extensive dissection, making the procedure less invasive and more widely applicable [2]. Since then, their techniques have been modified further to make it simpler and some variations, such as transabdominal cerclage (TAC), have also come up for failed cervical cerclages. While cervical cerclages are less invasive, have lower surgical risk, shorter recovery time, and can be removed easily, TACs are invasive, have increased operative risks with longer recovery, and removal of cerclage is not easy. Each route of cerclage has its own advantages as well as shortcomings, making decisions difficult for clinicians as well as patients.

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Shirodkar cerclage and had a good outcome. This case highlights the benefit of modified Shirodkar cerclage in cases of previously failed cervical cerclages.

### CASE REPORT

A 22-year-old woman, Gravida 5 Para 1 with no living issue, had prior two fetal losses between 24 and 26 weeks, and presented to us in her fifth pregnancy. Her first conception was spontaneous and ended in miscarriage at 5 months' gestation. In her second pregnancy, she had missed an abortion at 6 weeks. The third pregnancy was complicated by a threatened abortion at 4 months, which was initially managed conservatively; however, she subsequently had a pre-term vaginal delivery 4 weeks later. During her fourth pregnancy, due to a history suggestive of cervical insufficiency, a history-indicated McDonald cerclage was placed at 16 weeks' gestation when the cervical length was 2 cm. At 29 weeks, she experienced pre-mature rupture of membranes (PROM), after which she was managed with antibiotics, corticosteroids, and close maternal-fetal surveillance. Spontaneous labor ensued 24 h post-PROM, and she delivered a female neonate vaginally, with a birth weight of 1563 g.

Her fifth pregnancy was a spontaneous conception, booked at AIIMS. Antenatal investigations, along with first-trimester aneuploid screening, were normal. Given her obstetric history, she was counseled regarding the option of TAC. However, the patient declined this intervention and opted for a transvaginal

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approach. Hence, a decision for Shirodkar cervical cerclage was taken at 16 weeks gestation.

The patient underwent an elective Shirodkar cervical cerclage at 16 weeks of gestation under general anesthesia. She was positioned in dorsal lithotomy, and aseptic precautions were maintained with skin preparation using betadine. Prophylactic antibiotic IV cefotaxime 1 gram was administered 30 min before the procedure. Bladder catheterization was performed. The cervix was visualized and stabilized using sponge-holding forceps on both anterior and posterior lips. The cervico-vesical junction was identified, and a transverse incision was made at the junction to facilitate upward bladder retraction. A similar posterior incision was made to prevent rectal injury. The lateral angles of both incisions were extended using blunt dissection to create submucosal tunnels. A 30 cm Mersilene tape with two attached needles was passed submucosally from anterior to posterior on both sides of the cervix. The suture was secured with a knot tied posteriorly. The anterior defect at the cervico-vesical junction was closed with an absorbable suture.

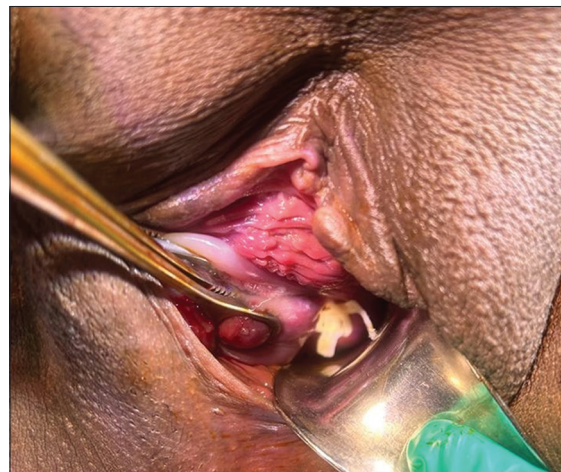
The patient tolerated the procedure well and had an uneventful post-operative recovery. She was started on a vaginal progesterone tablet and prescribed routine antenatal supplements, including iron and calcium. She was discharged on the 2<sup>nd</sup> day in stable condition. The remainder of her antenatal course was uneventful, and she was followed up regularly and was admitted at 37 weeks gestation for cerclage removal.

Under saddle block anesthesia, the patient was positioned in dorsal lithotomy. Bladder catheterization was performed, and continuous fetal monitoring was initiated using a Cardiotocograph probe. The anterior and posterior lips of the cervix were grasped with sponge- holding forceps. On examination, the knot of the previously placed Shirodkar cerclage was palpated approximately 4 cm above the external cervical os (Fig 1). The cervico-vesical fold was carefully opened, and the dissection was extended both anteriorly and posteriorly to expose the cerclage tape. The bladder was gently pushed upward to avoid injury. The ends of the Mersilene tape were identified and grasped, and the cerclage was removed with gentle traction.

Spontaneous rupture of membranes occurred 48 hours following cerclage removal. Labor was augmented, and the patient had a spontaneous vaginal delivery of a healthy male infant weighing 2465 g, with an APGAR score of 9/9. The post-partum period was uneventful. The patient was counseled and advised regarding prophylactic cerclage in future pregnancies due to her history of cervical insufficiency.

## DISCUSSION

Cerclage is categorized on the indication for its insertion [1]. History-indicated cerclage is performed electively between 11 and 14 weeks of gestation in women with a history of three or more previous preterm births (PTBs) or second-trimester losses. Ultrasound-indicated cerclage is offered to women with a history of one or more spontaneous PTBs with a short cervical length of



**Figure 1: Knot seen posteriorly**

<25 mm on transvaginal ultrasound. Rescue cerclage is performed when the cervix is already dilated and the fetal membranes are exposed through the cervical os. This is an emergency procedure that aims at prolonging pregnancy where PTB may be imminent.

The route of insertion of cerclage can be either transvaginal or abdominal [3]. The most commonly performed technique is the transvaginal McDonald cerclage, which involves placing a purse-string suture at the cervicovaginal junction without the need for bladder mobilization. This method is relatively simple and widely practiced due to its ease of performance. Another transvaginal approach is the modified Shirodkar cerclage, where the suture is placed higher on the cervix, closer to the internal os, following bladder mobilization. This technique is used in cases requiring additional cervical support, especially when a previous cerclage has failed, as it offers greater reinforcement. The TAC involves placing the suture at the cervico-isthmic junction, either through a laparotomy or laparoscopically (LAC). This approach is particularly useful in patients with failed transvaginal cerclage or anatomical conditions that make vaginal placement unfeasible. As the suture is placed higher, TAC provides more structural support to the cervix and is most effective.

The recent randomized-controlled MAVRIC trial showed the benefit of TAC, versus high vaginal as well as low vaginal cerclages. This multicentric randomized controlled trial showed that the incidence of PTB before 32 weeks was significantly lower in the TAC group (8%) compared to the low vaginal cerclage group (33%). However, no significant difference in outcomes was observed between high and low vaginal cerclage placements, suggesting that in women with recurrent cervical insufficiency and failed vaginal cerclage, TAC may offer a superior benefit in prolonging pregnancy [4].

In women with a previous unsuccessful transvaginal cerclage, the option of TAC should be discussed and considered [3]. One of the key advantages of TAC is that it provides cervical support in subsequent pregnancies as well. However, it is a more invasive procedure and necessitates delivery by cesarean section, which can be a limiting factor for some patients.

In our case, the patient was appropriately counseled regarding the option of TAC, especially in light of her history of failed

vaginal cerclage. However, she declined this option due to the requirement of a cesarean section for delivery. Respecting her preference and after careful evaluation, a decision was made to proceed with the placement of a modified Shirodkar cerclage, a transvaginal approach, as the comparative advantage of the Shirodkar procedure is to allow for vaginal delivery.

Comparative studies evaluating the McDonald and Shirodkar cerclage techniques have demonstrated that both are effective in managing cervical insufficiency [5-8]. The McDonald's cerclage, being simpler and less invasive, is widely used and typically associated with shorter operative time and fewer perioperative risks, making it a suitable option for routine cases. The Shirodkar cerclage, involving submucosal placement and bladder dissection, provides higher cervical support and is preferred in cases with a short or anatomically distorted cervix.

A retrospective multicenter study by Capmas *et al.* compared two cervical cerclage techniques – vaginal cervico-isthmic cerclage and classic cerclage, McDonald cerclage in women with a history of failed cervical cerclage. The study found no significant difference in the rate of pre-term deliveries before 30 weeks between the vaginal cervico-isthmic cerclage group and the McDonald cerclage group. However, women who underwent higher transcervical cerclage had fewer hospitalizations during pregnancy, shorter duration of hospitalization, and a lower incidence of threatened pre-term delivery. This highlights the potential benefits of the cervico-isthmic cerclage in managing women with a history of failed prophylactic cerclage [6]. Ultimately, the choice between the two techniques should be individualized, taking into account anatomical considerations, clinical history, and surgeon expertise.

Our case is unique because in our case, the cervical length was short, making it challenging to achieve adequate support using McDonald cerclage. The decision to place a high cervical cerclage allowed utilization of the remaining supravaginal portion of the cervix, enabling a more anatomically appropriate repair. In addition, by avoiding dissection of the posterior cul-de-sac, the invasiveness of the procedure was reduced, contributing to a smooth and uneventful post-operative recovery.

In conclusion, while TAC remains a valuable option in selected cases, the transvaginal route, particularly using a high Shirodkar technique, is significantly less invasive and can be successfully employed in women with previously failed vaginal cerclages, providing careful case selection and surgical expertise.

## CONCLUSION

The Shirodkar cerclage can be a valuable option in patients with a history of failed McDonald's cerclage. In addition to being minimally invasive compared to transabdominal approaches, the Shirodkar technique has shown potential in reducing the risk of

PTB in selected patients. In our case, its use following a previously unsuccessful McDonald's cerclage resulted in the prolongation of pregnancy and a favorable perinatal outcome, supporting its role as an effective alternative in appropriately selected women.

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## AUTHOR'S CONTRIBUTORS

Dr. Soni Bharti - Drafting the article and revising it critically for important intellectual content, Final approval of the version to be published. Dr. Puja Korde - Drafting the article and revising it critically for important intellectual content. Dr. Richa Vatsa - Concept and design of the study and interpretation of data, Final approval of the version to be published. Dr. K Aparna Sharma - Concept and design of the study and interpretation of data, Final approval of the version to be published.

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