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Round Ligament Pulley—A Novel Technique of Sling Surgery

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Abstract

Background: Uterovaginal (UV) prolapse is a common gynecological disorder often affecting women in their reproductive years. While traditional surgical treatments such as vaginal hysterectomy and Manchester repair are effective, they are not suitable for women wishing to preserve their fertility. This article introduces a novel, conservative surgical technique—Round Ligament Pulley Sling Surgery—aimed at treating UV prolapse while preserving reproductive potential.
Methods: This case series was conducted over a period of 10 years (2004–2024) and involved 200 women with Stage II or III uterovaginal prolapse. The surgical technique utilized the patient's own round ligament as a supportive sling to reposition the uterus. Patients were selected based on their desire for fertility preservation and absence of cervical elongation. Outcomes assessed included procedural success, complications, future fertility, and delivery outcomes.
Results: All procedures were successful, with no intra- or post-operative complications. Minimal blood loss and a short operative time were noted. During one-year follow-up, 56 women conceived, and 49 delivered vaginally. No adverse reproductive or functional outcomes were reported.
Conclusion: The Round Ligament Pulley technique is a safe, simple, and effective fertility-preserving surgical option for uterovaginal prolapse. It demonstrates excellent clinical outcomes and allows for vaginal delivery post-surgery.

Keywords: Uterovaginal prolapse, Sling surgery, Round ligament, Fertility preservation, Conservative gynecologic surgery

INTRODUCTION

UV prolapse is one of the very common gynecological disorders presenting in
outdoor. The primary cause of pelvic organs prolapse (POP) is weak cardinal/ uterosacral ligaments. There are various stages of uterine prolapse: Stage I: The cervix of uterus has begun to descend but is still in the vagina, Stage II: The cervix of the uterus has descended to the vaginal opening, Stage III: The cervix of the uterus has begun to breach through the vaginal opening, Stage IV: The cervix of the uterus has fully descended through the vaginal opening.

Options of treatment of pelvic organ prolapse; are either conservative or surgical. Conservative treatment includes physiotherapy and pessary insertion which usually fails and has very low compliance. Surgical treatment options include vaginal hysterectomy with anterior and posterior colpoperineorrhaphy, Manchester's repair is the option when the uterus needs to be conserved but long term impacts on future fertility are not that good.

But these operative techniques are not ideal for a young lady who wants to retain her reproductive functions and at the same time to be free of symptoms.
In the evolution of conservative operations for prolapse, many sling operations were described that soon became very popular because of their simplicity and effectiveness. Initially body connective tissue was used but later native fascia was replaced by synthetic sling like Mersilene which gives lifelong support.

Conventional sling surgery often involves a more invasive approach, leading to longer recovery times compared to less invasive techniques. Patients may experience significant postoperative pain due to the more extensive surgical incisions and tissue manipulation required. The risk of injury to the bladder and urethra is higher during conventional sling surgery

due to the proximity of these structures to the surgical site. There is a possibility of the recurrence of incontinence or prolapse over time, necessitating repeat surgery. Moreover, chances of vaginal delivery are lesser after conventional sling surgery.

MATERIALS AND METHODS

This study was done for 10 years from 2004 to 2024. It is a case series of 200 women. The outcome measures were success of the procedure, operative and post operative complications, future fertility and its subsequent outcome. Inclusion criteria were women with second and third degree uterovaginal prolapse who wished to conserve fertility and who were not suitable for Manchester repair i.e, with no cervical lengthening. Exclusion criteria were women of age more than 40 years and whose family was complete.

Abdomen was opened through midline incision of nearly 2 cm given approx. 3-4 cms above the pubic symphysis. For every 1 cm descent of uterus, incision was given 1 cm above the pubic symphysis. Abdomen opened in layers. Uterus, bilateral adnexa and round ligament was identified. Round ligament was held with babcock forceps, 2 cms from the corneal end. It was pulled up and stitched to the upper edge of ipsilateral rectus sheath with 2-0 round body prolene. Same was done on opposite side. Abdomen closed in layers. After surgery, per vaginal examination is done to confirm that cervical os is at the level of ischial spine. In this way, round ligament acts as a pulley for pulling up the uterus and thus treating prolapse. Post operatively cough and constipation was prevented. All the patients were followed up for a period of 1 year.

RESULTS

Uterine prolapse was found to be more among women with high parity. The technique is easy and there were no intra-operative or post-operative complications in all cases. Blood loss was negligible. Post-operative recovery were uneventful in all patients.

On discharge, speculum examination of all patients was performed and cervix was found at or above the level of ischial spines.

On later follow up, up to 1 year, 56 patients got pregnant and 49 patients delivered vaginally except 7 patients who had absolute obstetric indications for Caesarean section.

Table 1: Age in years

<20 years	9
21-25 years	38
26-30 years	43
31-35 years	58
36-40 years	52

Table 2: Parity

Nulliparous	22
Para 1	37
Multiparous	141

Table 3: Post-operative complications

Characteristics	**7 days**	**1 month**	**6 month**	**1 year**
Pain	8	Nil	Nil	Nil
Menstrual irregularity	Nil	Nil	Nil	Nil
Sexual Problems	Nil	Nil	Nil	Nil
Bowel and bladder problems	Nil	Nil	Nil	Nil

Table 4: Future fertility and Mode of Delivery

56 patients got pregnant	
Normal Delivery	**Caesarean section**
49	7

DISCUSSION

In these cases, we used a new technique for treatment of UV prolapse in women desiring child bearing. Round ligament is pulled up and stitched to the upper edge of ipsilateral rectus sheath with 2-0 round body prolene on both sides. In this technique, Round ligament acts as a pulley to pull up the uterus and cervix at or above the level of ischial spine, thus correcting prolapse.

It is less time consuming and takes only 10-15 minutes. It is an easy operation with minimal blood loss and no risk of bladder injury.

Moreover, it does not hamper fertility and preserves the reproductive function for women whose family is not complete. There is no need of Caesarean section after this surgery for the delivery of baby and patient can deliver vaginally.

This is a one of a kind variant of Sling surgery and is not yet studied by anyone else. It is a safe alternative to conventional sling surgeries after which if the women conceives, Caesarean section is done to deliver.

CONCLUSION

Round ligament pulley is an effective and simple procedure with less time consumption and less blood loss with a very high success rate. This technique preserves future fertility and vaginal delivery is possible. It is worth to be performed for conservative surgical management of uterine prolapse in women during reproductive life or older patients who wants to preserve their uterus.

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