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Case Report

An Uncommon Descent: Uterus-Preserving Laparoscopic Pectopexy for Stage III Uterine Prolapse in a Nulligravid Woman

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Abstract *- Background: Pelvic Organ Prolapse (POP) in nulliparous women is rare and poses unique challenges in management, particularly in preserving fertility. Laparoscopic pectopexy has emerged as a safe alternative to sacrocolpopexy, avoiding presacral dissection and its associated complications. Case Presentation: A 23-year-old nulliparous woman presented with complaints of a progressively increasing mass descending per vaginum for one year, associated with discomfort during standing and walking. Clinical examination and POP-Q assessment revealed Stage III uterine prolapse (point C +3) with anterior compartment involvement. Extensive evaluation ruled out connective tissue disorders, systemic inflammation, metabolic causes, and mechanical strain factors. The patient underwent laparoscopic pectopexy, using a polypropylene mesh fixed bilaterally to the iliopectineal (pectineal/Cooper's) ligaments with non-absorbable sutures. Results: The procedure was completed without intraoperative or postoperative complications. The patient showed excellent anatomical correction and complete resolution of symptoms. Conclusion: Laparoscopic pectopexy is a safe, effective, and fertility-preserving surgical option for managing apical prolapse in young nulliparous women.*

Keywords *- Pectopexy, Pelvic Organ Prolapse, Nulliparous, Laparoscopy, Cooper's Ligament.*

1. Introduction

Pelvic Organ Prolapse (POP) is a common pelvic floor disorder that predominantly affects multiparous and postmenopausal women. When it does occur in the young nulligravid woman, it is very unusual and poses special diagnostic and therapeutic problems. This presentation suggests the potential for congenital or intrinsic defects in the pelvic support structures if there is no other known cause (such as childbirth, obesity, chronic increase in intra-abdominal pressure or previous pelvic surgery). Treatment of such patients is not limited to anatomical correction, but also includes consideration of a patient's future fertility and uterine function.

Traditionally, the procedures of abdominal sacrohysteropexy and sacrocolpopexy have been considered as the standard reconstructive procedures for the repair of apical prolapse due to their good anatomical results. These procedures, however, call for dissection around the sacral promontory where large blood vessels, autonomic nerves and even the ureter can be endangered. Furthermore, the presacral dissection has been correlated with increased complexity and bowel dysfunction in certain patients.

Laparoscopic pectopexy, first described by Banerjee and Noé, offers an alternative uterus-preserving approach by utilizing the bilateral iliopectineal (Cooper's) ligaments for mesh fixation. By avoiding the presacral space, the procedure maintains the physiological vaginal axis while potentially reducing the risk of vascular, neurological, and bowel-related complications. Although increasing evidence supports the safety and effectiveness of laparoscopic pectopexy, published reports involving young nulligravid women remain limited, and data regarding fertility-preserving management in this population are scarce.

The present report describes a rare case of Stage III uterine prolapse in a 23-year-old nulligravid woman successfully managed with uterus-preserving laparoscopic pectopexy. The case highlights the clinical decision-making process, relevant surgical anatomy, technical considerations, and short-term outcomes, while emphasizing the role of

pectopexy as a fertility-preserving reconstructive option in carefully selected young women.

2. Case Report

A 23-year-old nulliparous woman presented with a one-year history of a mass descending per vaginum, associated with discomfort during standing and walking. The vaginal bulge had progressively increased in size, causing her mild urinary urgency. There was no history of chronic cough, constipation, heavy lifting, or previous pelvic surgery. She has irregular cycles (30–40 days) with normal flow. No dysmenorrhea. No comorbidities, allergies, or history of blood transfusion. On general physical examination, she is thin built with a BMI: 20 kg/m². Her local examination revealed her external genitalia looked normal. Uterine descent noted. No ulceration present.

2.1. POP-Q Findings

Aa +2	Ba -3	C +3
Ap +1	Bp -3	D -8
GH 3.5cm	PB 3cm	TVL 9cm

Fig. 1 Preoperative image showing Stage III uterine prolapse

POP-Q findings (Table.1) were consistent with Stage III uterine prolapse with anterior compartment involvement. (Figure 1). All her blood routine parameters were within normal limits: haemoglobin: 13.1 g/dL, ESR: 22, CRP: 0.6, TSH:1.04. Renal function and Serum electrolytes were within normal limits. Ultrasound pelvis showed mild uterine prolapse with a normal endometrial cavity—bilateral polycystic ovaries with minimal free fluid. Considering the unusual presentation of Stage III uterovaginal prolapse in this young, nulligravida woman, a systematic evaluation was carried out to determine possible predisposing factors. The possibility of a connective tissue disease was considered, but the patient did not have any of the clinical features suggestive of syndromic connective tissue disease, and the echocardiogram showed no evidence of aortic root dilatation. The exclusion of systemic inflammatory conditions was done due to normal haematological parameters and inflammatory markers. Other causes, such as metabolic and endocrine, were excluded, and thyroid function, renal function and serum electrolytes were normal. Mechanical risk factors for pelvic organ prolapse, such as multiparity, obesity, chronic cough and other increased intra-abdominal pressure, were not observed. So, a secondary cause was not identified, and it was inferred that there was a latent or congenital weakness of the pelvic support structures.

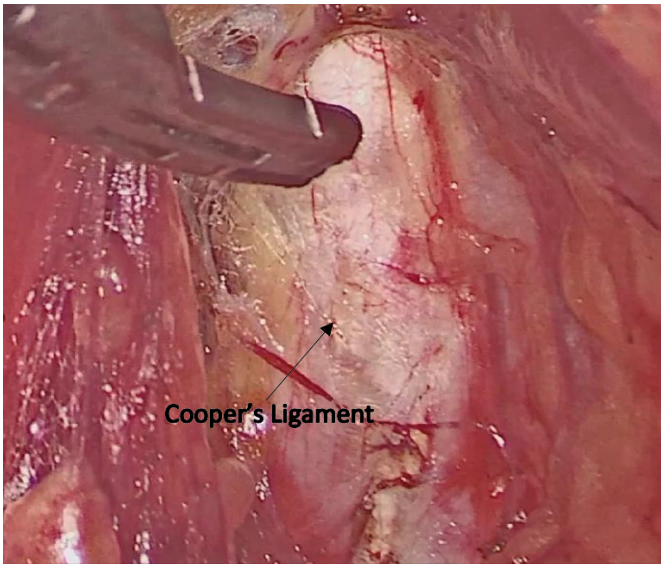

Fig. 2 Characteristic white glistening appearance of the Cooper's ligament (Lighthouse Sign)

Patient counselled, consented and underwent laparoscopic pectopexy. The retroperitoneum was carefully dissected on either side of the iliopectineal (Cooper's) ligaments, leaving all the surrounding vascular structures intact (Figure 2). Special care was taken to avoid damage to the external iliac vein, external iliac artery, obturator vessels and corona mortis as presented in our case (Figure 3) and was successfully protected with a bipolar energy source and obturator nerve. Careful dissection was performed to achieve good exposure of the pectineal ligaments without compromise to the surrounding neurovascular structures. A macroporous polypropylene mesh was used. Non-absorbable sutures were used to bilaterally anchor the mesh to the pectineal ligaments and attach it to the anterior part of the uterus to provide apical support (Figure 4), and the round ligament was plicated on either side for additional support (Figure 5&6). The mesh was completely peritonealised. The procedure was completed without complications. The patient had an uneventful intraoperative and postoperative course with good symptomatic relief. Complete anatomical correction with a good physiological vaginal axis was achieved. (Figure 7)

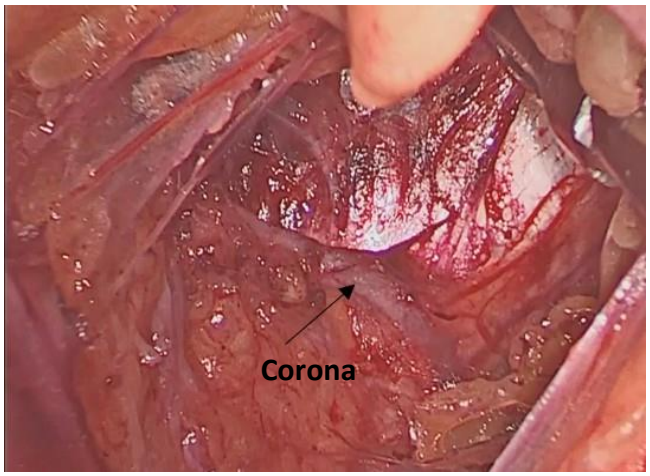

Fig. 3 Identification of Corona Mortis during retroperitoneal dissection (corona mortis- 'Crown of death')

The patient was reviewed at 6 weeks, 3 months, 6 months, and annually thereafter. Follow-up assessment included evaluation of prolapse symptoms, pelvic examination for anatomical support, assessment of urinary and bowel symptoms and detection of any mesh-related complications. As she was nulligravida, she was advised about future fertility and pregnancy. Long-term follow-up should include monitoring for menstrual regularity, planning for conception and obstetric outcomes.

At the 12-month follow-up, the patient remained asymptomatic with no sensation of vaginal bulge. Pelvic examination demonstrated satisfactory apical support with no evidence of recurrent prolapse. There were no mesh-related complications, urinary symptoms, bowel dysfunction, or dyspareunia, and the patient expressed satisfaction with the surgical outcome.

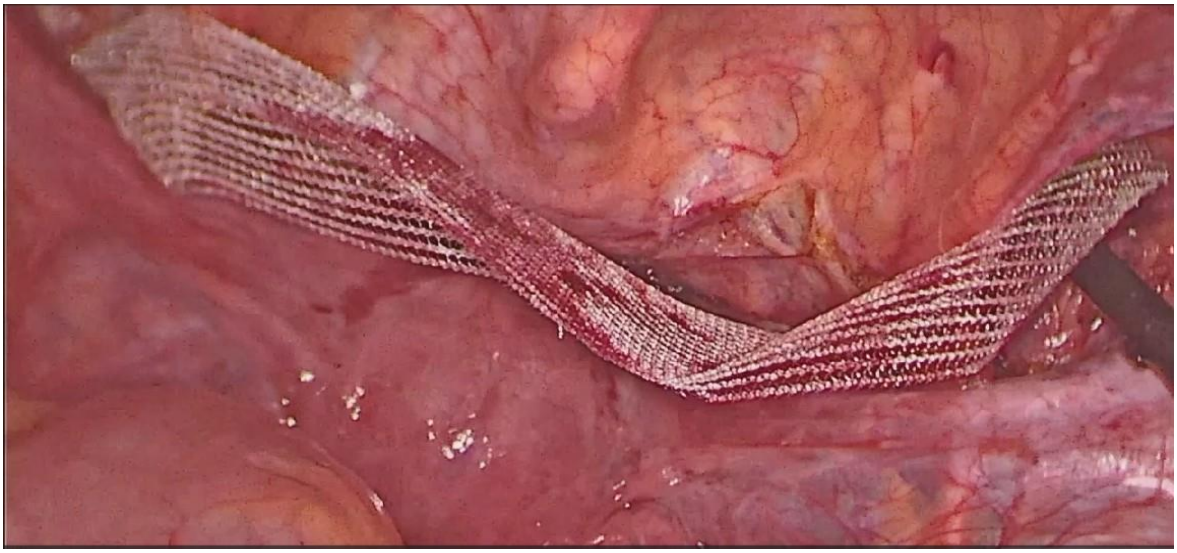

Fig. 4 Image showing lightweight macroporous mesh

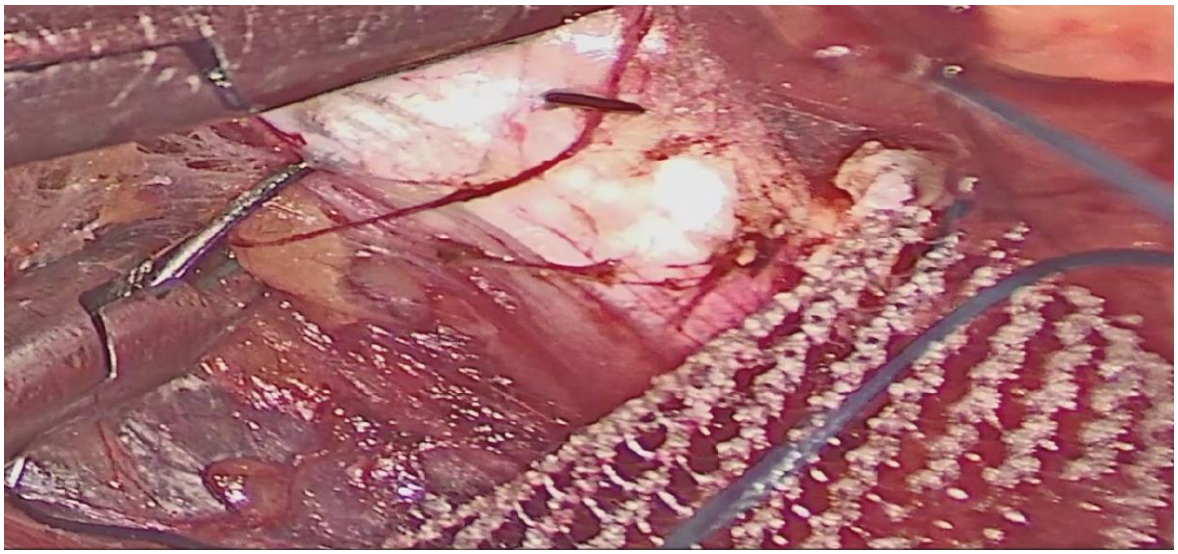

Fig. 5 Image showing non-absorbable sutures taken on the right cooper's/ iliopectineal ligament

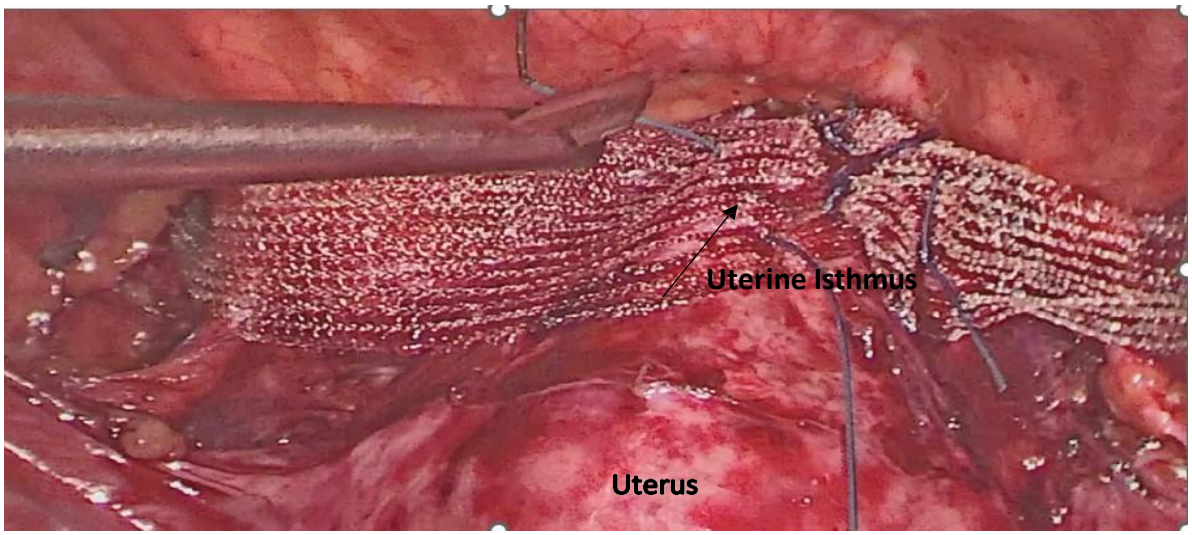

Fig. 6 Intraoperative image showing mesh fixation during pectopexy

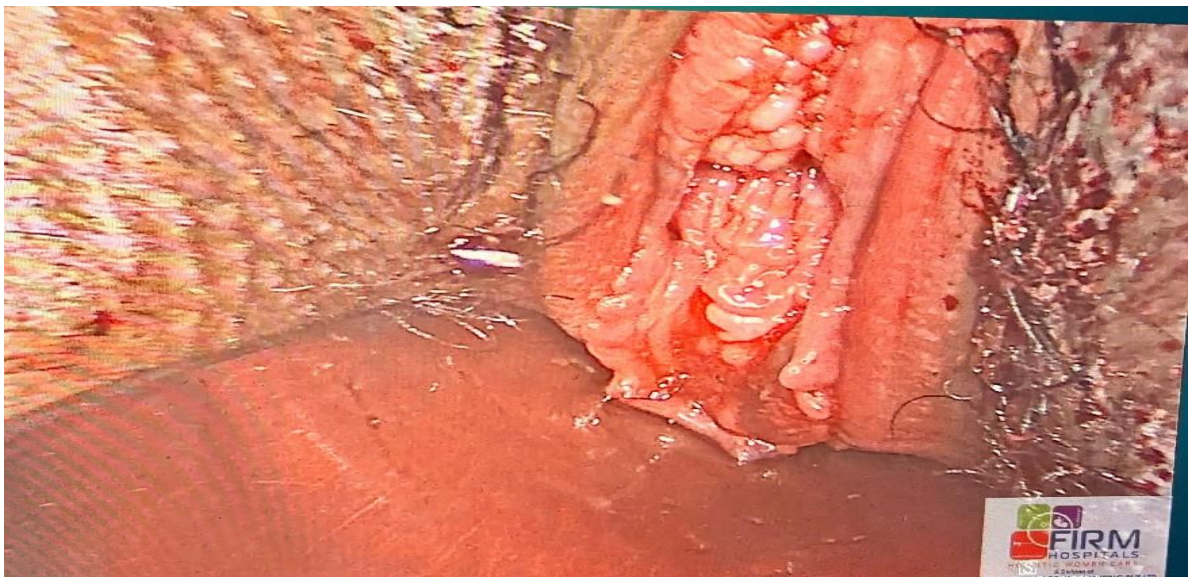

Fig. 7 Immediate Postoperative Image

3. Discussion

Advanced pelvic organ prolapse in a young nulligravid woman is an uncommon clinical entity and represents a unique reconstructive challenge. In multiparous or postmenopausal women, any treatment for prolapse must take into account not only permanent anatomic correction but also the maintenance of fertility, uterine integrity and future reproductive potential. Despite a thorough clinical evaluation, there was no evidence of any conventional risk factors for Prolapse (Multiparity, Obesity, Chronic cough, Constipation, Connective tissue disorders, and previous pelvic surgery). This is an unusual presentation that may indicate a congenital or intrinsic weakness of the pelvic supporting structures, but the exact cause is still unclear.

This presentation was also rare, which helped in surgical planning. With the patient's request for preservation of the uterus and her young age, a reconstructive procedure that would restore apical support with a minimum of operative morbidity was deemed most appropriate. Laparoscopic pectopexy was chosen over a traditional sacrohysteropexy as it is not associated with presacral dissection, avoids alteration of the physiological vaginal axis, and minimizes potential for injury to the major blood vessels, autonomic nerves, and adjacent pelvic structures. The technical benefits are especially applicable to young women, where long-term function of the pelvic floor and reproductive potential are significant factors.

Laparoscopic pectopexy, originally described by Banerjee and Noé, has become a successful option for the management of apical pelvic organ prolapse without uterus removal. This technique preserves the anatomical axis of the vagina and avoids dissection around the sacral promontory,

[1] which avoids the risk of presacral bleeding, injury to autonomic nerves, injury to the ureter and postoperative bowel dysfunction, which is not the case with sacrohysteropexy. All these anatomical and functional benefits have led to the increasingly wide acceptance of pectopexy, especially in women where uterine preservation is desired.

A sound understanding of the surgical anatomy remains essential for the safe performance of pectopexy. The Cooper's ligament provides a strong and reliable point of fixation; however, important neurovascular structures, including the external iliac vessels, obturator nerve, obturator vessels, and vascular variants such as the corona mortis, lie in close proximity to the operative field. In our patient, the corona mortis was clearly identified during retroperitoneal dissection and safely secured using bipolar energy before mesh fixation. Careful identification of these anatomical landmarks facilitated safe dissection and prevented intraoperative vascular injury, highlighting the importance of meticulous retroperitoneal dissection during laparoscopic pectopexy.

The pectineal ligament is adjacent to the external iliac vessels, obturator vessels, obturator nerve and variants of the vessels like corona mortis. Knowing these relationships will prevent vascular and neurological injury during retroperitoneal dissection. [2]

The use of lightweight macroporous polypropylene mesh in our patient was logical to provide long-term support at the apex in the hope of integration with the tissue. Macroporous meshes (pore size >75 μm) allow for a greater level of fibroblast ingrowth, collagen deposition and neovascularisation, improving long-term incorporation and lowering the chances of mesh encapsulation and chronic infection. (Figure-8), The mesh was completely peritonealised with the aim of reducing the exposure of the mesh and improving the long-term surgical results.

The most notable aspect of the present case is the rarity of advanced uterine prolapse in a 23-year-old nulligravid woman without identifiable risk factors. Fertility preservation was an important consideration in surgical planning. Laparoscopic pectopexy allowed uterine conservation while providing durable apical support and restoration of normal pelvic anatomy. At 12 months of follow-up, the patient remained asymptomatic with no evidence of prolapse recurrence and expressed satisfaction with the surgical outcome.

The literature reviewed has been supportive of the safety and effectiveness of laparoscopic pectopexy. Studies by Biler et al. [3,4] proved that pectopexy had a shorter operative time, but had the same anatomical outcome as sacrocolpopexy with lower perioperative complication rates. In the same way, Noé et al. [5] found that pectopexy had comparable support at the apex with fewer bowel symptoms after surgery. Further excellent anatomical restoration, high patient satisfaction and low recurrence rates were reported in more recent studies by Winget et al. [6] and Salman et al. [7], which further supported the use of pectopexy as a beneficial reconstructive procedure in selected patients. The most significant finding of the present case is the absence of any risk factor for advanced uterine prolapse in a 23-year-old, nulligravid woman. Surgical planning was a key factor in fertility preservation. Laparoscopic pectopexy was performed, which enabled uterine conservation and restoration of normal pelvic anatomy with an effective apical support. The patient was asymptomatic at a 12-month follow-up and was very satisfied with the surgery.

Overall, the literature available suggests that laparoscopic pectopexy has anatomical results similar to sacrocolpopexy and several potential benefits, such as no presacral dissection, lower risk for major vascular injuries, maintaining the physiological vaginal axis and reduced incidence of bowel dysfunction. The positive results experienced in our patient also confirm the use of pectopexy as an effective and safe uterus-preserving surgical procedure in well-selected young women suffering from uterine prolapse.

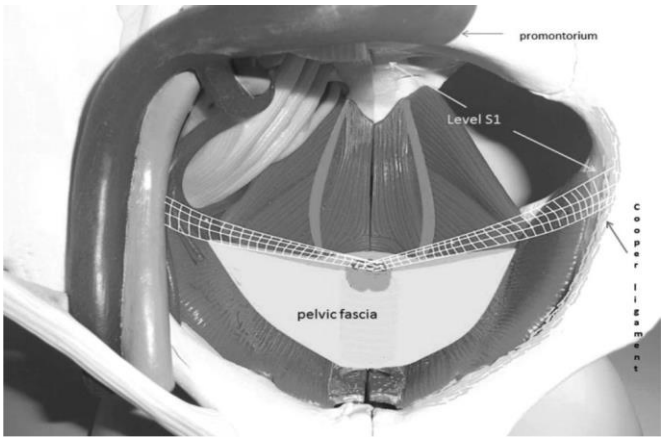

Fig. 8 Demonstration of mesh anchored over the cooper's ligament

4. Strengths and Limitations

The present report describes a rare case of Stage III uterine prolapse in a young nulligravid woman successfully managed with uterus-preserving laparoscopic pectopexy. The strengths of this report include a comprehensive preoperative evaluation, a detailed description of the surgical technique, careful identification of key anatomical landmarks, and favorable anatomical and functional outcomes at 12-month follow-up. However, this report is limited by its single-case design and relatively short follow-up period. Long-term data regarding recurrence, fertility, pregnancy, and obstetric outcomes are not yet available. Larger prospective studies with extended follow-up are

needed to establish further the long-term safety, durability, and reproductive outcomes of laparoscopic pectopexy in young women.

5. Conclusion

Laparoscopic pectopexy represents a safe and effective uterus-preserving procedure for the management of apical pelvic organ prolapse in carefully selected young women. The technique avoids the dissection of the presacral tissue, thus reducing the risk of major vascular and neurological complications, and offers excellent anatomical restoration and symptom relief. In this very unusual case, a nulligravida woman had a uterine prolapse of Stage III, which was treated with a pectopexy, and the favourable results both anatomically and functionally highlight the reconstructive role of pectopexy as a fertility-sparing technique. Larger studies with long-term follow-up are needed to establish its efficacy and durability further.

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