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Case Report

Open sacrohysteropexy with polypropylene mesh for stage III uterovaginal prolapse in a young premenopausal woman with concurrent recurrent pregnancy loss: a case report

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ABSTRACT

Uterovaginal prolapse (UVP) occurring in premenopausal women demands uterus-preserving surgical strategies that offer durable anatomical correction without compromising future reproductive potential. Open sacrohysteropexy (OSH) using type-I polypropylene mesh achieves reliable apical support while retaining the uterus. When accompanied by recurrent pregnancy loss (RPL), the clinical picture warrants a concurrent systematic aetiological evaluation. A 39-year-old woman (P1L1A3) presented with a five-to-six-year history of a vaginal mass prolapsing through the introitus, lower abdominal discomfort, and dysuria. Examination demonstrated the cervix lying 2 cm beyond the hymenal ring, consistent with Pelvic Organ Prolapse Quantification (POP-Q) Stage III uterocervical descent, a Stage I anterior compartment defect (cystocele), and the absence of posterior compartment prolapse on reduction. She additionally carried an evolving diagnosis of RPL following three consecutive first-trimester pregnancy losses. Open sacrohysteropexy with polypropylene mesh was performed under general anaesthesia on 19 February 2026 and was completed without intraoperative complications. The postoperative course was uneventful, and the patient was discharged in stable condition on postoperative day six. Open sacrohysteropexy with polypropylene mesh is a safe and reproducible uterus-preserving procedure for advanced pelvic organ prolapse in young women. Its concurrent use with structured RPL investigation represents an opportunity to address both anatomical and reproductive morbidity within the same admission episode.

Keywords: Open sacrohysteropexy, Uterovaginal prolapse, Recurrent pregnancy loss

INTRODUCTION

Pelvic organ prolapse (POP) is defined as the descent of one or more of the anterior vaginal wall, posterior vaginal wall, or the apex of the vagina (cervix or vaginal vault) beyond the hymenal ring.¹ It affects an estimated 50% of parous women to a measurable degree, with a lifetime surgical intervention rate of 10–19%.² The Pelvic Organ Prolapse Quantification (POP-Q) system, developed by Bump et al. in 1996 and endorsed by the International

Urogynecological Association (IUGA) and International Continence Society (ICS), remains the internationally mandated standard for objective quantification of prolapse.³

Although peak prevalence occurs in the postmenopausal period, a clinically significant and growing proportion of women with advanced POP are premenopausal, presenting at an age where preservation of the uterus carries both biological and psychosocial importance.⁴ In this context,

uterus-preserving hysteropexy procedures have gained prominence. Sacrohysteropexy whether performed by open laparotomy or laparoscopic/robotic access suspends the uterus and cervix to the anterior longitudinal ligament overlying the sacral promontory (S1–S2) via a synthetic mesh graft, restoring Level I apical support as described in DeLancey's nomenclature.^{5,6}

Recent literature has additionally described simplified and fertility-preserving modifications of sacrohysteropexy using single-mesh or posterior-only fixation techniques. These approaches aim to minimise mesh burden and surgical dissection while maintaining adequate apical support. Proposed advantages include avoidance of extensive bladder dissection and broad ligament window creation, preservation of uterine vascularity and cervical compliance, and reduced operative morbidity and operative time. Such modifications may be particularly relevant in women desiring future fertility or uterine preservation; however, high-quality comparative evidence remains limited, and most available data arise from retrospective cohort studies and technical reports rather than randomised controlled trials.

The American Urogynecologic Society (AUGS) and IUGA joint terminology report recognize sacrohysteropexy as a distinct procedure from sacrocolpopexy, with specific anatomical and mesh-fixation requirements.⁷ Comparative randomised data and long-term cohort studies report anatomical success rates of 85–95%, with preservation of sexual function and avoidance of vault prolapse the primary drawback of hysterectomy-based approaches.⁸

The co-occurrence of recurrent pregnancy loss (RPL) defined by the European Society of Human Reproduction and Embryology (ESHRE) as two or more clinically recognised pregnancy losses prior to 24 weeks of gestation adds a further dimension to clinical management.⁹ While POP repair does not directly treat RPL, correction of

anatomical descent and restoration of normal uterine axis may reduce mechanical contributors to early pregnancy failure, including impaired endometrial vascularity and cervical incompetence secondary to chronic prolapse.¹⁰

We present this case in accordance with the SCARE 2023 guidelines for surgical case report writing.¹¹ The aim of this report is to describe the clinical presentation, surgical technique, intraoperative findings, and postoperative management of a 39-year-old premenopausal woman who underwent open sacrohysteropexy for Stage III UVP with concurrent RPL under evaluation, and to contextualise the findings within the current evidence base.

CASE REPORT

A 39-year-old female self-presented as a walk-in to the outpatient department of Obstetrics and Gynaecology at M. M. Institute of Medical Sciences and Research, Mullana, Haryana, India, and was subsequently admitted as an inpatient. Patient identity has been anonymised in accordance with institutional ethics guidelines and relevant data protection provisions; written informed consent for publication was obtained prior to submission.

Table 1: Admission vital signs.

Parameter	Recorded value	Reference range
Pulse rate	90 beats/min	60-100 beats/min
Blood pressure	110/70 mmHg	<120/80 mmHg
Temperature	98.6°F (37.0°C)	97.8–99.1°F
Respiratory rate	16 breaths/min	12-20 breaths/min
SpO2 (room air)	Not formally recorded on admission	≥95%

Table 2: Complete blood count and coagulation parameters (18 February 2026).

Parameter	Result	Reference Range	Interpretation
Haemoglobin	11.9 g/dl	12.0–15.0 g/dl (female)	Mild anaemia
Total leucocyte count	$11.14 \times 10^3/\mu\text{l}$	$4.0\text{--}10.0 \times 10^3/\mu\text{l}$	Mild leukocytosis
Polymorphonuclear cells	64.4%	40–75%	Normal
Lymphocytes	29.8%	20–45%	Normal
Platelet count	$291 \times 10^3/\mu\text{l}$	$150\text{--}400 \times 10^3/\mu\text{l}$	Normal
Packed cell volume	37.5%	36–47%	Low-normal
MCV	85.6 fl	83–98 fl	Normal
MCH	27.2 pg	27.0–32.0 pg	Normal
INR	1.01	0.8–1.2	Normal (safe for surgery)
Prothrombin time (patient)	12.0 seconds	9.8–13.1 seconds	Normal

Table 3: Liver function tests, renal function tests, and thyroid function.

Test	Result	Reference range	Interpretation
Bilirubin total	0.138 mg/dl	0.2–1.0 mg/dl	Normal
Bilirubin direct	0.024 mg/dl	0.0–0.2 mg/dl	Normal
SGOT/AST	30.3 u/l	5–35 u/l	Normal
SGPT/ALT	6.7 u/l	5–35 u/l	Normal
Alkaline phosphatase	138 u/l	28–112 u/l	Mildly elevated*
Total protein	7.68 g/dl	6.0–8.0 g/dl	Normal
Serum albumin	4.56 g/dl	3.5–5.3 g/dl	Normal
Blood urea	20.5 mg/dl	18–40 mg/dl	Normal
Serum creatinine	0.53 mg/dl	0.7–1.2 mg/dl	Low-normal
Serum sodium	142 meq/l	135–145 meq/l	Normal
Serum potassium	4.6 meq/l	3.5–5.5 meq/l	Normal
TSH	2.77 μ iu/ml	0.270–4.20 μ iu/ml	Normal

Table 4: Infectious serology and urine examination.

Test	Result	Interpretation
HBsAg (CLIA)	0.19 (non-reactive)	No active hepatitis B infection
Anti-HCV (CLIA)	0.02 (non-reactive)	No hepatitis C antibodies detected
Anti-HIV 1 and 2 (CLIA)	0.12 (non-reactive)	No HIV antibodies detected
Syphilis (CLIA)	Non-reactive	No serological evidence of syphilis
Urine RBC	20–22/HPF (dipstick 2+)	Haematuria - likely mechanical (cystocele)
Urine pus cells	10–12/HPF	Pyuria - irritative; nitrites negative
Urine nitrites	Negative	Bacterial infection unlikely
Urine bacteria	Absent	No frank urinary tract infection
Leucocyte esterase	1+	Correlates with irritative haematuria

Table 5: Intraoperative findings.

Structure	Intraoperative Finding
Uterus	Normal size; no fibroids; no surface adhesions
Cervix	Anterior lip elongated; posterior lip of normal morphology
Uterosacral ligaments (bilateral)	Measured at 6 cm in length bilaterally; attenuated
Bilateral ovaries	Normal morphology and surface appearance
Bilateral fallopian tubes	Patent, normal morphology
Posterior compartment (rectum)	Intact; no rectocele confirmed on intraoperative assessment
Mesh material	Type I macroporous monofilament polypropylene mesh
Mesh fixation	Posterior aspect of the cervix and uterus to the anterior longitudinal ligament at the sacral promontory

Table 6: Inpatient postoperative pharmacological management.

Medication (Generic Name)	Dose and route	Frequency	Duration	Indication
Cefoperazone/Sulbactam (Zonamax)	1.5 g IV	12-hourly	3 days	Broad-spectrum antibiotic prophylaxis/cover
Clindamycin	600 mg IV	8-hourly	3 days	Anaerobic cover
Tranexamic acid (Tranexa)	1 g IV	8-hourly	1 day	Antifibrinolytic, haemostasis
Pantoprazole (Pantop)	40 mg IV	Once daily	3 days	Gastric mucosal protection
Diclofenac sodium	75 mg IV	Thrice daily	3 days	Analgesia (NSAID)
Ondansetron (Emeset)	8 mg IV	As required	3 days	Antiemetic

The patient reported a five-to-six-year history of a sensation of something protruding from the vagina,

progressively worsening over this period. She additionally described lower abdominal pain and dysuria. She

explicitly denied stress urinary incontinence, urge incontinence, obstructive voiding symptoms, and bowel dysfunction (no constipation, faecal urgency, or incomplete evacuation). There was no history of prior pessary use or previous pelvic floor physiotherapy.

The patient's last menstrual period (LMP) was approximately 15 days prior to presentation (precise date not recalled). Her cycles were regular with a periodicity of 28–30 days, lasting 3–4 days, and associated with average flow volume. She denied clot passage, dysmenorrhoea, intermenstrual bleeding, and post-coital bleeding.

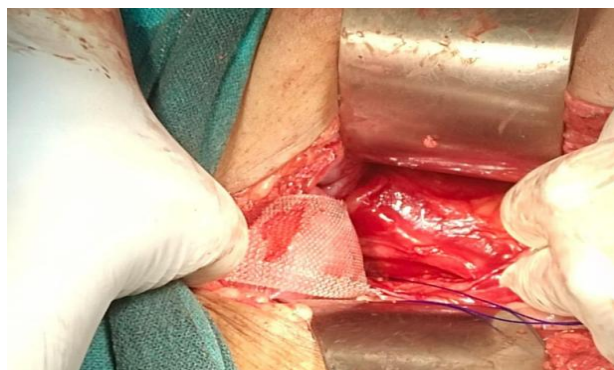


Figure 1: Intraoperative photograph during open sacrohysteropexy demonstrating polypropylene mesh positioned on the posterior aspect of the uterus and cervix prior to fixation to the anterior longitudinal ligament over the sacral promontory. The central uterine surface, bilateral retractors, and fixation sutures are visible within the operative field.



Figure 2: Intraoperative photograph during open sacrohysteropexy demonstrating polypropylene mesh positioned on the posterior aspect of the uterus and cervix prior to fixation to the anterior longitudinal ligament over the sacral promontory. The central uterine surface, bilateral retractors, and fixation sutures are visible within the operative field.

The patient had been married for 25 years (P1L1A3). Her single living child a female was delivered five years prior by spontaneous vaginal delivery in a hospital setting, complicated by a prolonged second stage of labour; no instrumental delivery was required, and no perineal trauma was recorded beyond the expected. She subsequently sustained three consecutive first-trimester spontaneous abortions, each occurring at approximately six weeks of gestation (gestational age 1.5 months), without surgical intervention or reports of fetal cardiac activity. No teratological, chromosomal, or immunological evaluation had been completed at the time of presentation. These losses satisfied the ESHRE definition of RPL and were under active investigation.

There was no significant medical history; specifically, the patient denied a history of diabetes mellitus, epilepsy, chronic kidney disease, or bronchial asthma. Surgical history was unremarkable. She reported no prior blood transfusions. Family history was non-contributory. No drug allergies or adverse medication reactions were identified. Personal history revealed normal sleep, appetite, and bowel habits. Tobacco, alcohol, and recreational drug use were denied.

On general examination, the patient was calm, conscious, and well-oriented to time, place, and person. There was no pallor, jaundice, cyanosis, clubbing, pedal oedema, or peripheral lymphadenopathy. Vital signs on admission were within acceptable limits for elective gynaecological surgery (Table 1). Respiratory examination revealed bilateral air entry with no added sounds. Cardiovascular examination demonstrated normal heart sounds (S1, S2) with no murmur. Abdominal examination revealed a soft, non-tender abdomen.

Speculum examination (per speculum, P/S) revealed the cervix to be lying 2 cm distal to the hymenal ring. In accordance with the POP-Q classification system, this finding is consistent with Stage III uterocervical descent. A Stage I anterior compartment defect (cystocele) was additionally identified; on digital reduction of the prolapse, the posterior compartment was found to be structurally intact, with no rectocele demonstrated. Per vaginal (P/V) examination confirmed a cervix of normal macroscopic appearance, with no discharge or active bleeding. The uterus was anteverted, normal in size (consistent with a non-gravid uterus), firm in consistency, and freely mobile. Bilateral fornices were free and non-tender, with no adnexal masses palpable. The findings were consistent with POP-Q Stage III uterovaginal prolapse with Stage I anterior compartment involvement and no posterior compartment defect.

A standard preoperative assessment was performed. Investigations are summarised below (Tables 2–4). It is assumed these were completed as part of the RPL workup but results are not available for inclusion in this report.

Haematuria with pyuria in the absence of bacteriuria and with negative nitrites is consistent with a mechanical irritative aetiology attributable to the cystocele, rather than an infective urinary tract pathology. No preoperative urine culture sensitivity result was available for inclusion; it is assumed empirical antibiotic prophylaxis was guided by local institutional protocols.

Following multidisciplinary review and gynaecological unit discussion, open sacrohysteropexy was selected as the procedure of choice on the basis of the following considerations: (i) advanced Stage III uterocervical descent with anterior compartment involvement; (ii) patient age of 39 years with an intact uterus and ongoing fertility evaluation in the context of RPL; (iii) patient preference for uterine preservation after structured counselling covering all surgical alternatives; and (iv) the absence of posterior compartment defect, reducing procedural complexity. Surgical alternatives discussed included laparoscopic sacrohysteropexy, sacrospinous hysteropexy, and vaginal hysterectomy with sacrospinous vault fixation; the patient was counselled that open access was selected given institutional expertise and the degree of descent. Risks of mesh-related complications, including erosion, mesh contraction, and de novo dyspareunia, were explicitly discussed. Written, informed consent was obtained prior to theatre. Institutional anaesthetic review confirmed fitness for general anaesthesia.

The abdomen was accessed via a midline vertical sub umbilical incision consistent with standard open pelvic surgery. The pelvis was explored systematically. Intraoperative findings were recorded as follows (Table 5).

Sacrohysteropexy was completed without intraoperative complications. No visceral, vascular, or neurological injuries were recorded. The mesh was secured to the posterior cervicouterine junction and posterior aspect of the uterus and subsequently fixed to the anterior longitudinal ligament at the sacral promontory using non-absorbable sutures.

The operative approach represented a modified uterus-preserving sacrohysteropexy technique with limited mesh utilisation and selective fixation strategy. Compared with conventional anterior-plus-posterior mesh configurations, the present modification was intended to reduce tissue dissection and preserve native pelvic vascular and cervical support structures. In particular, minimisation of bladder dissection and avoidance of extensive broad ligament dissection were considered advantageous in a patient undergoing concurrent fertility evaluation.

Peritonealisation was performed over the mesh where anatomically feasible. The abdomen was closed in layers.

Intraoperative photographic documentation

Figure 1 depicts the intraoperative field during open sacrohysteropexy. The polypropylene mesh is positioned

posterior to the cervicouterine junction prior to sacral promontory fixation. Metallic Deaver retractors provide bilateral exposure of the pelvis. The glistening red uterine surface is visible centrally, with non-absorbable fixation sutures (violet, lower-right) prepared for sacral promontory anchorage. No inadvertent organ injury or haemorrhage is visible in the operative field.

Postoperative course and management

Immediate postoperative period

The patient was transferred to the postoperative recovery unit in a stable haemodynamic state. She was managed with intravenous antibiotics, analgesics, haemostatic agents, and antiemetic cover as per the institutional perioperative protocol (Table 6). Oral intake was reintroduced progressively. Mobilisation was encouraged from postoperative day one. A urinary catheter was maintained for 24–48 hours postoperatively; no voiding dysfunction was documented on trial of void.

Condition at discharge (25 February 2026 — Postoperative Day 6)

The patient was discharged in stable condition. Discharge clinical parameters were: Pulse 78 BPM, Blood Pressure 110/68 mmHg, Respiratory Rate 18 cycles per minute, SpO₂ 98–100% on room air, Temperature 98.4°F. Cardiovascular and respiratory examination was unremarkable. The abdomen was soft. The abdominal wound was dry with no signs of surgical site infection. Breast examination was normal. Bowel and bladder function were re-established prior to discharge.

Discharge prescription

Oral pharmacotherapy prescribed at discharge included: Amoxicillin/Clavulanate (Augmentin) 500 mg thrice daily for 4 days; Clindamycin 600 mg twice daily for 4 days; Diclofenac sodium 50 mg orally as required for breakthrough pain; Chymoral Forte (chymotrypsin/trypsin combination) one tablet thrice daily for 14 days as a proteolytic anti-inflammatory; and Pantoprazole 40 mg once daily for 4 days for gastric protection.

Postoperative instructions and follow-up plan

The patient received the following structured postoperative instructions in accordance with the requirements of SCARE 2023:

Pelvic rest (abstinence from sexual intercourse) for a minimum of four weeks from the date of surgery.

Strict avoidance of activities increasing intra-abdominal pressure: squatting, heavy lifting, prolonged straining, and coughing without support.

Iron-rich and high-fibre diet; maintenance of adequate oral hydration to prevent constipation.

Maintenance of personal hygiene; abdominal wound care as directed.

Alternate suture removal planned at postoperative day 10 (28 February 2026); complete suture removal at postoperative day 12.

Outpatient review in Unit III Gynaecology Clinic after one week (OPD: Wednesdays and Saturdays).

Gynaecology OPD review on day 2 of the next menstrual cycle, with plan to initiate combined oral contraceptive pill (OCP) in the subsequent cycle as per the treating unit's RPL-associated endometrial preparation protocol.

Emergency contact instructions: the patient was provided with emergency contact and instructed to present urgently in the event of abdominal pain, fever, or excessive per-vaginal bleeding.

No outpatient follow-up data are available beyond the planned review schedule, as the follow-up period fell outside the timeframe of this report.

DISCUSSION

This case illustrates several clinically important themes: the epidemiology and staging of POP in young women; the evidence base for sacrohysteropexy and the rationale for uterine preservation; specific intraoperative findings and their clinical significance; and the intersection of POP with RPL.

Advanced POP in a premenopausal woman aged 39 years is uncommon but not exceptional. Risk factors operative in this patient included a single prior vaginal delivery complicated by a prolonged second stage of labour, a well-established independent risk factor for levator ani muscle avulsion and progressive apical descent.¹² The POP-Q system classifies this presentation as Stage III, defined by prolapse greater than 1 cm beyond the hymenal ring but not to the total vaginal length.³ The degree of cervical externalisation (2 cm beyond the introitus on speculum examination) is consistent with this classification. Notably, the absence of posterior compartment defect on reduction is important for surgical planning, as it avoided the need for posterior mesh application or posterior colporrhaphy.

Sacrohysteropexy is the procedure with the most robust evidence base for uterine-preserving POP repair. The IUGA/AUGS joint terminology report formally classifies sacrohysteropexy as a distinct abdominal or laparoscopic procedure in which a mesh graft attached to the uterus at the cervicouterine isthmus, in this case on the posterior aspect of the cervix and uterus, and suspended to the sacral promontory.⁷ The TULIP randomised controlled trial and

subsequent meta-analyses have confirmed non-inferiority to hysterectomy-based sacrocolpopexy with respect to anatomical cure, reoperation rate, and patient-reported outcome measures.⁸

The choice of the open rather than laparoscopic approach in this instance reflects local institutional practice and expertise, and is consistent with the evidence demonstrating equivalent anatomical outcomes for open versus minimally invasive sacrohysteropexy, with the trade-off of a longer recovery and greater incision-related morbidity.¹³ Polypropylene mesh of type I (macroporous monofilament) was used, consistent with current international guidelines that recommend lightweight, macroporous mesh for abdominal sacrocolpopexy and its hysteropexy equivalent.¹⁴

In the present case, open sacrohysteropexy with polypropylene mesh fixation was performed successfully without intraoperative or immediate postoperative complications. The procedure provided adequate apical support while preserving the uterus, which was an important consideration in this premenopausal patient. However, long-term follow-up is required to assess durability of repair, recurrence, mesh-related complications, and future reproductive outcomes.

The finding of anterior cervical lip elongation with a normal posterior lip, and bilateral uterosacral ligament attenuation measured at 6 cm, are both recognised intraoperative correlates of chronic, advanced uterovaginal prolapse. Cervical elongation is a distinct pathological entity from prolapse per se; it represents hypertrophic elongation of the supravaginal portion of the cervix secondary to chronic dependent oedema and mechanical traction.¹⁵ It may contribute to apparent cervical incompetence and, theoretically, to early pregnancy loss a potentially relevant factor in the context of this patient's RPL. Uterosacral ligament attenuation or elongation reflects the failure of native apical support, and was further supported by the intraoperative measurement of 6 cm bilateral ligament length (normal < 2–3 cm in unsupported tissue).¹⁶

A haemoglobin of 11.9 g/dl represents mild anaemia, likely nutritional (iron-deficiency) in the context of regular menstruation and probable dietary insufficiency; this is a well-described preoperative finding in women presenting for major gynaecological surgery in resource-limited settings. The mild leukocytosis (TLC $11.14 \times 10^3/\mu\text{l}$) in the absence of clinical or microbiological evidence of infection may reflect a stress response, physiological variation, or subclinical irritative urinary change secondary to the cystocele. The isolated mild elevation in alkaline phosphatase (138 U/l; reference 28–112 U/l) in the setting of normal transaminases and bilirubin is clinically non-specific and does not indicate hepatobiliary pathology; common causes include physiological variation, bone isoenzyme activity, or artefactual

laboratory variation, and it did not alter anaesthetic or surgical fitness.

The co-occurrence of Stage III POP and RPL in a 39-year-old woman raises important pathophysiological questions. RPL is a multifactorial condition; ESHRE guidelines recommend systematic evaluation for antiphospholipid syndrome, parental chromosomal abnormalities, uterine structural anomalies, inherited thrombophilia, and endocrine disorders (including thyroid dysfunction and diabetes).⁹ In this patient, TSH was within normal limits, and viral serology was non-reactive, ruling out common infective and endocrine contributors.

Whether surgical correction of prolapse directly benefits RPL outcomes remains speculative and is not supported by prospective evidence. However, restoration of normal uterine axis and relief of cervical traction including elongation may remove one theoretical mechanical contributor to early pregnancy failure. The planned initiation of OCPs in the subsequent menstrual cycle is consistent with temporary suppression of ovulation during pelvic healing, allowing mesh integration prior to any future conception attempt, and is appropriately concordant with ESHRE guidance that recommends a minimum recovery interval before attempting pregnancy following pelvic reconstructive surgery.⁹

CONCLUSION

This case report describes the successful management of a 39-year-old premenopausal woman with POP-Q Stage III uterovaginal prolapse and concurrent RPL under evaluation, who underwent open sacrohysteropexy with polypropylene mesh fixation to the sacral promontory. The procedure was performed without intraoperative or immediate postoperative complications, and the patient was discharged in stable condition on postoperative day six.

Key learning points from this case are threefold. First, open sacrohysteropexy with type-I polypropylene mesh is a safe, reproducible, and anatomically effective procedure for advanced POP in premenopausal women in whom uterine preservation is a clinical priority. Second, the intraoperative finding of cervical elongation and uterosacral ligament attenuation provides important anatomical context for understanding the patients prolapse and its potential contribution to RPL, underscoring the importance of systematic intraoperative documentation. Third, in young women with POP and concurrent RPL, a coordinated multidisciplinary approach incorporating urogynaecology, reproductive medicine, and clinical genetics is essential to optimize both anatomical and reproductive outcomes.

Open sacrohysteropexy with polypropylene mesh provided satisfactory short-term anatomical correction and uterine preservation in this patient. Further follow-up is required to evaluate long-term anatomical and

reproductive outcomes. However, robust comparative evidence for such modifications remains limited.

Further prospective studies examining the impact of uterus-preserving POP repair on RPL outcomes are warranted to inform evidence-based counselling in this patient population.

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