

# Abdominal Sacrocolpopexy for Post-hysterectomy vault Prolapse with Prolene Mesh in Women Attending in BMIMS, Pawapuri

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## Abstract

**Introduction:** Vault prolapse is a common health problem; however, severe morbidity is rare. However, it can have a marked effect on quality of life. Many surgical procedures have been described using the abdominal or vaginal approach. The procedure choice often depends on the individual surgeon's choice and experience. The abdominal sacral colpopexy employs the interposition of a synthetic mesh or tissue graft between the vagina and sacrum. The surgical mesh consists of a flat, net-like structure that is surgically implanted to support weaknesses of soft tissue, hence its application in treating pelvic prolapses.

**Aims and Objectives:** The aims and objectives are to evaluate abdominal sacrocolpopexy (ASC) with prolene mesh as an operative technique performed at our institution in symptomatic vault prolapse in post-hysterectomy patients.

**Materials and Methods:** A total of 12 patients underwent ASC due to symptomatic vault prolapse after a hysterectomy between July 2021 and March 2023 at the obstetrics and gynecology department of BMIMS, Pawapuri, was retrospectively reviewed using the hospital information management system.

**Results:** Twelve women had vault repair by ASC procedure. In three women along with sacrocolpopexy for vault prolapse, posterior colpoperineorrhaphy was done for rectocele. No major complication occurred during sacrocolpopexy in any patients. In none of these patients were blood transfusions necessary considering the small amount of blood loss.

**Conclusion:** ASC has proven to be superior to other techniques. The choice of surgical approach depends on the preference and experience of the gynecologist. The procedure and experience of a gynecologist are important in repairing vault prolapse after total abdominal hysterectomy or vaginal hysterectomy to reduce recurrence.

**Key words:** Abdominal sacrocolpopexy, Prolene mesh, Vault prolapse

## INTRODUCTION

Vault prolapse is a common health problem; however, severe morbidity is rare. However, it can have a marked effect on quality of life. One of the common often hidden gynecological morbidities is vaginal prolapse which includes vault prolapse after hysterectomy. Vaginal prolapse post-hysterectomy includes vault prolapse, cystocele, enterocele, and rectocele mainly. Prolapse of the vaginal vault and

other adjacent structures occurs through the vaginal wall to a variable degree. Many surgical procedures have been described using the abdominal or vaginal approach. The procedure choice often depends on the individual surgeon's choice and experience. The Ideal procedure should have a low risk of morbidity and mortality but should also have long-term durability.

A detailed history, clinical evaluation, and physical examination are required to plan appropriate management. The maintenance of normal anatomy is dependent on pelvic floor support which is itself dependent on the functional and structural integrity of the striated muscle of the pelvic floor and the surrounding connective tissues.

The etiology of prolapse is multifactorial, advancing age, parity, and collagen weakness are all quoted as significant

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predisposing factors. Concomitant surgery for pelvic organ prolapse (POP) repairs is common with approximately 50% of patients having more than one procedure during POP repair.<sup>[1,2]</sup> Approximately 50% of parous women will have some degree of prolapse and only 10–20% of these seek medical help.<sup>[3]</sup>

The abdominal sacral colpopexy employs the interposition of a synthetic mesh or tissue graft between the vagina and sacrum. The surgical mesh consists of a flat, net-like structure [Figure 1a] that is surgically implanted to support weaknesses of soft tissue, hence its application in treating pelvic prolapses. The mesh creates tension around bodily structures and is thus useful in managing dysfunctions caused by weaknesses of muscle and soft tissue.<sup>[4]</sup> Several materials have been used to create the mesh structure for surgical implantation. However, the most common is synthetic PP. Prolene mesh is a rigid, strong, and crystalline non-absorbable, thermoplastic produced using the propene monomer (C<sub>3</sub>H<sub>6</sub>) n. It is a linear hydrocarbon resin. It is non-toxic and thus considered appropriate for use in humans. Prolene mesh is uniquely useful due to its high electrical and chemical resistance at raised temperatures.

## MATERIALS AND METHODS

A total of 12 patients underwent abdominal sacrocolpopexy (ASC) due to symptomatic vault prolapse after a hysterectomy between July 2021 and March 2023 at the obstetrics and gynecology department of BMIMS, Pawapuri, was retrospectively reviewed using the hospital information management system.

The patient came with a chief complaint of something coming out of the vagina after a few months to a year post-hysterectomy either by total abdominal hysterectomy or vaginal hysterectomy. Preoperative investigations including ultrasound were done as per the hospital protocol. Proper

counseling regarding the procedure and follow-up protocol was elaborated to the patient and her relatives.

The risk of mesh erosion and recurrence of prolapse was explained. Informed written consent was obtained from all patients.

### Inclusion Criteria

Women over 30 years of age with major vault prolapse after hysterectomy were included in the study.

### Exclusion Criteria

Women over 30 years of age with minor vault prolapse. Women with serious illnesses or not fit for anesthesia were excluded from the study.

Technique-Knitted polypropylene mesh of 6 × 11 cm size and prolene suture No. 1 are government supplies in our hospital [Figure 1a]. Under anesthesia, the abdomen was opened as an infra umbilical longitudinal incision or suprapubic transverse incision depending on the previous abdominal scar. A vaginal pack was already given which pushed the vault into the pelvic cavity. The vault was caught by allis forceps at two angles and the peritoneum on that was dissected. PP mesh was cut in 2 × 11 cm.

One end of which was cut in mid-position so a Y-shaped mesh was formed. The bifurcated end of the mesh was fixed to an anterior and posterior vaginal wall of the vault with the help of prolene suture No. 0 [Figure 1b]. Now, we dissected the peritoneum at the sacral promontory and cleaned it with a peanut swab. A white glistening anterior longitudinal ligament was visualized. Of 2–3 stay sutures were taken on the anterior longitudinal ligament by prolene sutures No. 1. Now, long artery forceps were enhanced just below the peritoneum up to the posterior vaginal wall of the vault. From where the long end of the fixed mesh was caught by long artery forceps and dragged retroperitoneally up to the sacral promontory. Mesh was fixed to the anterior longitudinal ligament through stay

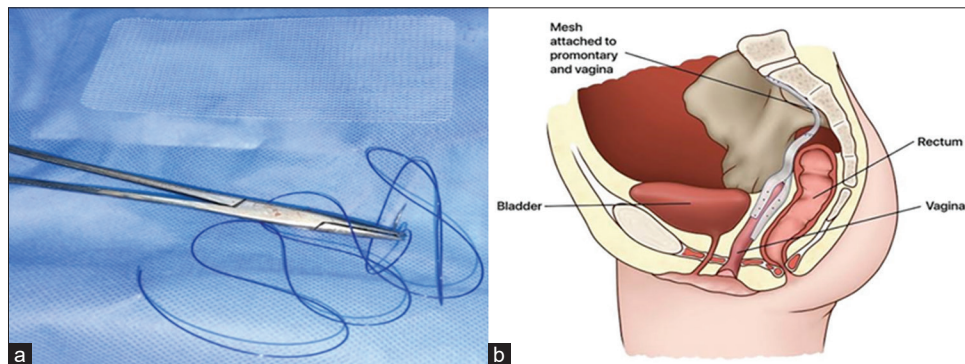


Figure 1: (a) Polypropylene (Prolene) synthetic mesh and suture No-1 used to treat pelvic organ prolapse; (b) Image demonstrating placement of polypropylene mesh in abdominal sacro-colpopexy to treat vaginal vault prolapse

suture. The extra mesh was cut out. The whole mesh was covered by the peritoneum by stitching the margin of the peritoneum by catgut No 0 at the sacral promontory and also at the vault. Now, the abdomen was closed in layers.

**Aims and Objectives**

The aims and objectives of the study are to evaluate ASC with prolene mesh as an operative technique performed at our institution in symptomatic vault prolapse in post-hysterectomy patients.

Our study also aims to reduce vault, prolapse-related morbidity among women.

**RESULTS**

Twelve women had vault repair by ASC procedure. Of 12 women, five had major vault prolapse alone and the other seven had major vault prolapse associated with either cystocele, rectocele, or both. In three women along with sacrocolpopexy for vault prolapse, posterior colporrhaphy (PCR) was done for rectocele. In one patient along with sacrocolpopexy, bilateral adnexal cyst removal was done in the same setting. Of the 12 women with vault prolapse, four had vault prolapse with cystocele and rectocele. Both anterior colporrhaphy and PCR were done in four patients and ASC was for vault prolapse. No major complication occurred during sacrocolpopexy in any patients. In none of these patients were blood transfusions necessary considering the small amount of blood loss. All the patients had bladder catheterization for 4–12 days (mean 6 days). Neither relapse of the treated prolapse nor infection or rejection of mesh occurred.

**DISCUSSION**

The synthetic prolene mesh implant has been the most commonly used for POP including vault prolapse surgery due to its easy availability and affordability. In our institute, prolene mesh is available free of cost as the Bihar government supplies.

ASC was first described by Lane, who used a mersilene vascular graft to bridge the gap between the vault and sacral promontory.<sup>[5]</sup> It is considered a gold standard procedure for the management of VVP.<sup>[6]</sup> A recent Cochrane review of 14 randomized controlled trials including 1004 women, concluded that abdominal sacral colpopexy was better than vaginal sacrospinous colpopexy (VSC) in terms of a lower rate of recurrent vault prolapse (relative risk [RR] 0.23, 95% confidence interval [CI] 0.07–0.77), less dyspareunia (RR 0.39, 95% CI 0.18–0.86), and a lower reoperation rate.<sup>[7]</sup> Because of deviation of the normal vaginal axis, VSC is associated risk of cystocele and SUI and it is not advisable

for women with short vagina and dyspareunia.<sup>[3]</sup> The primary aims of surgical treatment are the restoration of normal vaginal anatomy, improvement in clinical symptoms, and the restoration/maintenance of normal bladder, bowel, and sexual functions.<sup>[8]</sup> Coolen *et al.* in their systematic review and meta-analysis of nine randomized control trials of 846 women observed that the anatomic success rate of sacrocolpopexy (abdominal, laparoscopic [LSC], and robotic) is the best (62–90%) but the satisfaction rate of LSC was higher. Hence, LSC is preferable to ASC.<sup>[9]</sup>

Erosion of mesh can be one of the most severe late complications of sacrocolpopexy. There was a warning issued by the FDA about mesh in 2011 because of the seriousness of the problem with alloplastic materials such as pain, discomfort, and sometimes erosions of the vaginal wall and intestinal obstruction secondary to the formation of adhesion.<sup>[10]</sup> However, none of our patients had such complications till the year follow-up period. The reason might be the reperitonealization of the mesh during the surgery. Prolonged follow-up is needed to understand the long-term patient burden of this surgical method and the mesh used.

The most common complaint of patients with vault prolapse was incomplete emptying of the urinary bladder [Table 1]. In our study, 78% patient of vaginal prolapse were in the 30–50 year age group [Table 2]. More number of cases in the lower age group which could be due to hysterectomies performed relatively more in the earlier age group in our area. Four or more vaginal deliveries have 12 times more risk of genital prolapse.<sup>[11]</sup> In our study, 86% of patients had three or more vaginal deliveries [Table 3]. Coexistent pelvic floor defects which may be a cystocele, rectocele, or enterocele are present in 72% of patients with vault prolapse.<sup>[12]</sup> In our study, 64% of VP cases are associated

**Table 1: Clinical spectrum and symptomatology in vault prolapse patient**

Symptom of patient	Frequency	Percentage
UTI	4	33
SUI	2	17
Bowel disturbance	1	8
Incomplete emptying of UB	5	42
Total	12	100

**Table 2: Distribution of age**

Age in years	Frequency	Percentage
30–39	3	25
40–49	6	50
50–59	2	16.6
>60	1	8.4
Total	12	100

with cystocele, rectocele, or enterocele [Table 4]. Serious complications such as bowel injury, sacral myelitis, and severe bleeding have an estimated incidence of 2% (range 0–8%). The most common complication in the form of mild hemorrhage occurred in two patients who responded to compression during surgery in our study [Table 6].

ASC has proven to be superior to other techniques in terms of restoration of the normal vaginal axis and maintenance of vaginal capacity.<sup>[13,14]</sup> Contrary to previous reports, the point of sacral attachment does not affect the vaginal axis and attachment to the sacral promontory allows effective restoration of vaginal support, while maintaining both vaginal capacity and coital function.<sup>[15,16]</sup> A consistent cure rate of more than 90% has been reported,<sup>[17]</sup> with some studies reporting up to 95%.<sup>[18]</sup> It is further associated with a lower rate of recurrent prolapse and dyspareunia<sup>[19]</sup> which makes it a popular choice among surgeons, especially in fit patients. In the present study, 12 (100%) patients who underwent sacro-colpopexy for vault prolapse had no recurrence of vaginal vault prolapse 6–12 months after the procedures [Table 5].

**Table 3: Distribution of parity**

Parity	Frequency	Percentage
0	0	0
1–2	1	8.3
3 or more	11	91.7
Total	12	100

**Table 4: Types of prolapse after hysterectomy**

Total no. of cases	Frequency	Percentage
Major vault prolapses	5	41.7
Major vault prolapses with cystocele, rectocele, or enterocele	7	58.3
Total	12	100

**Table 5: Surgical management**

Surgical procedure	Vault prolapse only	Vault prolapse with cystocele/rectocele
Sacrocolpopexy	5	7
ACR		0
PCR		3
ACR + PCR		4

ACR: Anterior colporrhaphy, PCR: Posterior colpoperineorrhaphy

**Table 6: Complications during procedures**

Intraoperative complication	No of cases	Percentage
Hemorrhage	1	8
Nerve injury	0	0
Hematoma	0	0
Total	1	8

Prevention is always considered better than cure. McCall culdoplasty and its modification have been recognized as a preventive measure during a hysterectomy to prevent post-hysterectomy vault prolapse.<sup>[8,20]</sup> This involves the plication of both the uterosacral ligaments using continuous sutures, to obliterate the peritoneum of the pouch of Douglas as high as possible.

Sacrocolpopexy can also be done by LSC or robotic (RAS) routes with the application of the same principle as ASC. In theory, the LSC approach to the repair of the vault prolapse should follow the same principle as in the open technique, with laparoscopy only being the mode of surgical access. However, a highly skilled and experienced LSC surgeon is crucial. This approach has a steep learning curve and takes many years of practice to acquire the necessary skills.

## CONCLUSION

ASC with prolene mesh is confirmed as the most valid technique with no complications in the treatment of vault prolapse. Anatomical durability and sexual function are preserved so this was the most preferred option for surgical reconstruction of apical prolapse. The mesh is growing in popularity, but long-term efficacy and complications have to be studied.

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