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Original Article

# Mesh repair of vaginal wall prolapse

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ABSTRACT

*Background:* Over the last decade, mesh augmented surgical repair is being increasingly used in pelvic organ prolapse. Perigee and Apogee are comprehensive, single-use needle suspension kits that provide a standardized delivery method for mesh or graft-augmented repairs. This study has been carried out to study the safety and efficacy of the Perigee and Apogee mesh repair systems.

*Methods:* 10 cases of posterior vaginal wall prolapse with or without Apical prolapse underwent Apogee mesh repair surgery and 10 cases of anterior vaginal wall prolapse underwent Perigee mesh repair surgery. Depending on the findings either Apogee or Perigee or both were used. Patients were followed up for complications of the surgery if any, and for the relief of the symptoms related to prolapse and associated symptoms of bowel/bladder dysfunction. Objective cure rate was prolapse $<$ stage 1 as per the POPQ system. Data collected was statistically analyzed.

*Results:* The objective and subjective cure rates were 100%. Postoperative complications were minor. No patient developed de novo urinary urge symptoms, stress urinary incontinence or UTI postoperatively. There were no operative complications like bladder injuries, hematoma and rectal injuries. The mean blood loss was 180 ml and the mean duration of surgery during the Apogee and Perigee mesh repair was 51.5 $\pm$ 2.99 min and 60.9 $\pm$ 4.65 min respectively.

*Conclusion:* In the present study there was a significant improvement in the degree of prolapse after the mesh repair surgeries and the results were consistent even at 12 months follow up.



## Introduction

Pelvic organ prolapse (POP) is a bulge or protrusion of pelvic organs and their associated vaginal segments into or through the vagina.[1] It occurs when the upper vagina bulges into or outside the vagina and is a common and distressing condition which occurs when there is a weakness in the supporting structures of the pelvic floor allowing the pelvic viscera to descend.

Pelvic floor repair involving anterior and/or posterior colporrhaphy has been the established treatment for pelvic organ prolapse over the last century, but carries a high rate of recurrence.[2]

Graft materials have been employed in repairing defects or hernias throughout the body. Their purpose is to either completely replace the weak tissue by spanning across that tissue or to provide a scaffold for fibroblast infiltration. The patient's own connective tissue may grow into the graft, and

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if the graft is degradable, replace the graft as a supportive structure.

Graft materials include autologous tissues like cadaveric allografts and fascia, dermis and other connective tissues, xenografts from animal sources, and various synthetic materials. Julian first reported on the use of synthetic mesh for cystocele repair in 1996.[3]

Over the last decade, mesh augmented surgical repair is being increasingly used, mainly for secondary procedures.

Recently a number of prolapse repair mesh devices have been designed by different companies and extensively marketed as a minimally invasive approach for pelvic floor repair.

Each of these prolapse repair mesh devices utilizes woven monofilament low-weight macroporous polypropylene meshes with extension arms to permanently reinforce the pubocervical and the rectovaginal fascia. Insertion techniques are very similar and involve the use of especially shaped insertion needles to anchor the mesh arms. The needle passage lies close to vessels, nerves and organs of the pelvis and pelvic side wall, with slight differences between devices as to which structures are closest to the needle tracks.

Perigee and Apogee are comprehensive, single-use needle suspension kits that provide a standardized delivery method for mesh or graft-augmented repairs. Perigee uses the transobturator technique for the treatment of anterior prolapse; Apogee uses a posterior vaginal and perianal approach for the treatment of vault and posterior prolapse. These kits represent the "next generation" in vaginal prolapse repair because they allow for safe, consistent, comprehensive treatment and offer tension-free mesh or graft augmentation options to accommodate individual patient pathologies. They allow pelvic organ prolapse to be repaired in a minimally invasive manner with a short procedure time and a rapid postoperative recovery.

This study has been carried out to study the safety and efficacy of the Perigee and Apogee mesh repair systems in the anterior and posterior vaginal wall prolapse respectively.

## Materials and methods

10 cases of posterior vaginal wall prolapse with or without Apical prolapse underwent Apogee mesh repair surgery and 10 cases of anterior vaginal wall prolapse underwent Perigee mesh repair surgery. Depending on the findings either Apogee or Perigee or both were used.

The study population comprised of patients with anterior vaginal wall prolapse or posterior vaginal wall prolapse with or without Apical prolapse or both (including Post hysterectomy status) reporting to Gynaecology OPD meeting the inclusion and exclusion criteria.

The study was carried out from 01 September 2010 to 30 August 2012. (Period of observation till 30 December 2012). The patients underwent surgery for their respective defects and were followed up after that for their prolapse assessment. The last patient underwent surgery in January 2012. The average follow up was 14 months (range 12–16 months).

All patients with complaints of mass descending per vaginum were examined in the OPD to confirm the findings of prolapse. Prolapse assessment was done as per the POPQ (Pelvic Organ Prolapse Quantification) system.

In 1996, the International Continence Society defined a system of Pelvic Organ Prolapse Quantification (POPQ).[4] Demonstrating high intra and inter-examiner reliability, the POPQ system is a major advance in studying prolapse. It allows researchers to report findings in a standardized, easily reproducible fashion. This system contains a series of site-specific measurements of a patient's pelvic organ support. Prolapse in each segment is measured relative to the hymen, which is a fixed anatomic landmark that can be identified consistently. Six points are located with reference to the plane of the hymen: two on the anterior vaginal wall (points Aa and Ba), two in the apical vagina (points C and D), and two on the posterior vaginal wall (points Ap and Bp). All POPQ points, except total vaginal length (TVL), are measured during patient Valsalva and should reflect maximum protrusion. Depending on the findings the prolapse is staged as follows:

| | |
|---|---|
| Stage 0 | No prolapse is demonstrated. Points Aa, Ap, Ba, Bp are all at −3 cm, and point C is between total vaginal length (TVL) and (TVL −2 cm). |
| Stage I | The most distal portion of the prolapse is>1 cm above the level of the hymen. |
| Stage II | The most distal portion of the prolapse is<1 cm proximal or distal to the plane of the hymen. |
| Stage III | The most distal portion of the prolapse is<1 cm below the plane of the hymen but no further than 2 cm less than the total vaginal length. |
| Stage IV | Complete to nearly complete eversion of the vagina. The most distal portion of the prolapse protrudes to > + (TVL −2) cm. |

Inclusion criteria for Perigee or Apogee were patients with symptomatic anterior or posterior vaginal wall prolapse respectively with stage 3 or more as per the POPQ systems.

Exclusion criteria for Apogee and Perigee were patients with pelvic organ prolapse less than stage II (POPQ) or patients with history of prior graft-augmented repair and patients with systemic or local conditions that would preclude surgery or affect healing such as coagulation disorders, infections, compromised immune response, vaginal bleeding, uncontrolled diabetes, restricted leg motion (inability to conform to the lithotomy position), history of pelvic cancer in previous six months, history of radiation to the pelvic area.

Baseline investigation was done. Clearance from anaesthesiologist was obtained and suitable patients were selected for surgery using Apogee and Perigee vaginal mesh repair systems. All selected patients consented for the surgery.

Depending on the findings of the case either Apogee mesh system (Figs. 1 and 2) or Perigee mesh system (Figs. 3 and 4) or both repair systems were used. Concomitant procedures were performed as per requirement in each case.

Antibiotics (Injection Cefotaxime, Flagyl, Amikacin) were given for 07 days in total. Patients were discharged on postoperative day 7.

Data was collected preoperatively, postoperatively before discharge on day 7, at 1 month, 3 months, 6 months, and 12