

# A Case Series of Patients Operated for Stoppa Repair for Bilateral Inguinal Hernia<sup>1</sup>

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DOI:10.37648/ijrmst.v15i01.001

Received: 06 December 2022; Accepted: 19 January 2023; Published: 19 January 2023

## ABSTRACT

**Background:** Inguinal hernia repair is one of the most commonly performed general surgical procedures all across the world. Recent advancement in surgical techniques has paved way for the Stoppa's repair for inguinal hernia; based on the principal of providing strong posterior wall to the inguinal canal which is both physiologically dynamic and mobile.

**Aims and Objectives:** To study a case series of 10 patients operated for stoppa's repair for bilateral inguinal hernia and its advantages in technicality and patient's perspective.

**Methods:** This study was carried out in GCS medical Hospital between June 2022 and December 2022. Total of 10 patients were included in this study which were managed by Stoppa's open pre-peritoneal prolene mesh hernioplasty.

**Results:** This procedure has inherent advantages of wider operative field, potential inspection of all hernia sites, decreased operative time and post op morbidity of pain and is tensionless and sutures less in its true sense.

**Conclusion:** This advanced technique of bilateral inguinal hernia repair has excellent results in terms of early ambulation, minimal post-op pain, and minimal scar and so is an excellent option for patients of bilateral inguinal hernias.

**Keywords:** GPRVS, Myopectineal orifice, Trendelenberg position, Inguinodynia

## INTRODUCTION

Abdominal wall hernia can be defined as protrusion of a viscus through an opening/weakness in the fascio-muscular layers of anterior abdominal wall.<sup>[1]</sup> Such weakness/openings include Umbilicus, Myopectineal orifice and previous operative scars. Myopectineal orifice or specifically inguinal area out of all other above openings has highest potential

weakness which is largely contributing to the high incidence of inguinal hernia.

Incidence of inguinal hernia is clearly higher in males (25%) than females (2%).<sup>[4][5]</sup> Inguinal hernias contribute 75% of all the hernias, 2/3<sup>rd</sup> of which are indirect and 1/3<sup>rd</sup> are direct. Indirect inguinal hernia are

<sup>1</sup> How to cite the article:

Sharma V., Patel V.R., A Case Series of Patients Operated for Stoppa Repair for Bilateral Inguinal Hernia, IJRMST, Jan-Jun 2023, Vol 15, 1-9, DOI: <http://doi.org/10.37648/ijrmst.v15i01.001>

most common hernias in both men and women, Right >> left.<sup>[6]</sup>

In this article our aim is to study and evaluate the operative findings and its outcome of modified stoppa's repair in patient of bilateral inguinal hernia.

- Stoppa's Repair for bilateral inguinal Hernia is a newer approach to bilateral inguinal hernia in recent times. It is anatomically a pre-peritoneal repair where pre-peritoneal space is created and mesh hernioplasty is performed.
- It is particularly useful for repair of bilateral inguinal hernia, recurrent inguinal hernias, Sliding hernias, femoral hernias, large Inguino-scrotal hernias (Scrotal Abdomen) and some strangulated hernias.

## METHODS

This study was conducted at General Surgery Department of Gujarat Cancer Society Medical College, Ahmadabad between June 2022 and December 2022. The primary inclusion criteria in the patients was presence of bilateral inguinal hernia which were managed by Stoppa's modified open pre-peritoneal prolene mesh hernioplasty.

The patients excluded were those:

- Those not giving consent for the procedure.
- Unfit for anesthesia.
- Patients under 18 years of age

All the patients underwent a pre-operative, clinic laboratorial evaluation followed by pre-anesthesia clearance (PAC). Those clearing PAC were briefly informed regarding the procedure, its risk: benefit ratio and associated probable complication. A proper written informed consent was taken. Patients were also regarding alternative Lichtenstein approach and were allowed to choose they wanted.

## OPERATIVE STEPS

All patients underwent per-urethral catheterization on operating table, appropriate anesthesia (General/Spinal) was given. Patient was given supine with head low position. Prophylactic intravenous antibiotics (Ceftriaxone 1 gram stat) were administered in all patients at the time of induction. <sup>[2][3]</sup>

### 1. Pfannenstiel Approach:

- It involves using Pfannenstiel skin incision, followed by dissecting subcutaneous tissue, incising anterior rectus sheath transversely along the line of skin incision
- Anterior sheath is separated along with pyramidalis muscle from the underlying Rectus muscles inferiorly up to pubic symphysis and progressed into Retro-pubic space of Retzius done easily with index finger. This is advanced downward in front of the urinary bladder.



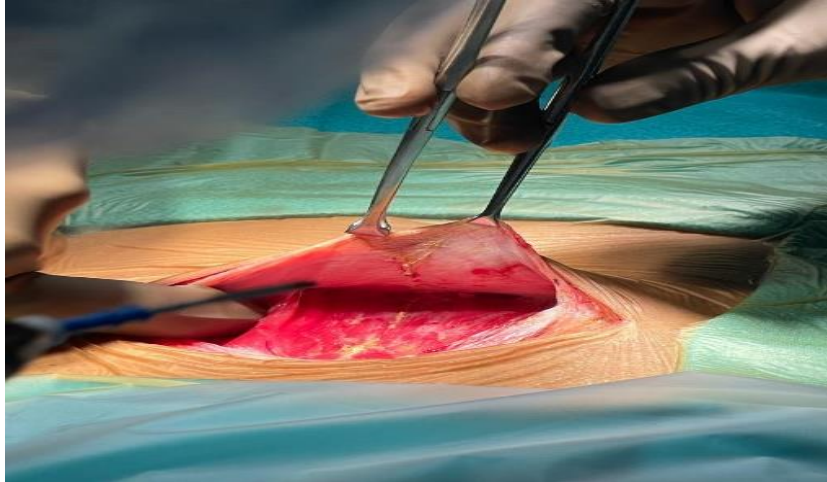
**Figure:** Classical Pfannenstiel skin incision

## 2. Vertical Midline Approach:

- Alternative to Pfannenstiel incision, Stoppa's repair can be done with lower vertical midline skin incision. Here the subcutaneous tissue and linea alba are cut along the line of skin incision, rectus abdomini muscles are separated from pre-peritoneal fat and pre-peritoneal space is reached. Superiorly dissection is

extended up to 3 cm below infra-umbilical region. Rectus muscles are retracted laterally from the midline and pre-peritoneal space is entered.

- This pre-peritoneal space is inferiorly up to space of Retzius and infero-laterally advanced behind the iliopubic ramus in the space of Bogros and laterally up to anterior superior iliac spine.<sup>[7]</sup>



**Figure:** Anterior sheath lifted off the Rectus Muscle

- Pre-peritoneal fat along with abdominal contents are retracted cephalad till the posterior wall defect in inguinal canal is visualized. At this point all other potential hernia sites viz. obturator and femoral hernia are examined. The pedicle of inguinal hernia is isolated. The hernia sac is reduced and the pre-

peritoneal cleavage is continued over the external iliac vessels and ureter on both sides.

- Vas deferens, testicular and gonadal vessels are separated out laterally from the visceral sac. The plane of dissection usually remains inferior to the arcuate line. Peritoneal tear if encountered are repaired with vicryl 3-0 sutures.



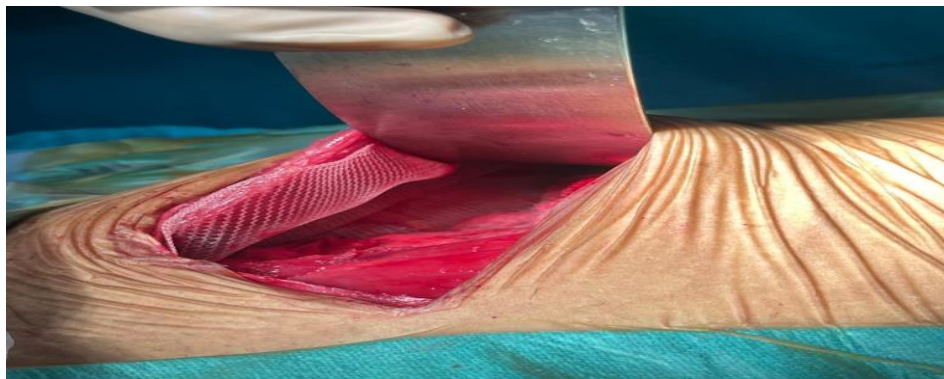
**Figure:** Isolation of vas deferens and gonadal vessels

**Placement of Prosthesis:** We used large 15\*12 cm sized macroporus monofilament polypropylene mesh prosthesis on each side for each patient. The dimensions of the prosthesis were measured as:

Transverse length: (Distance between ASIS and midline)

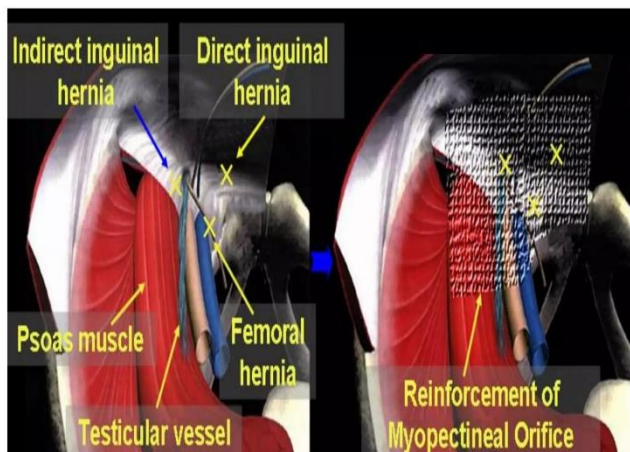
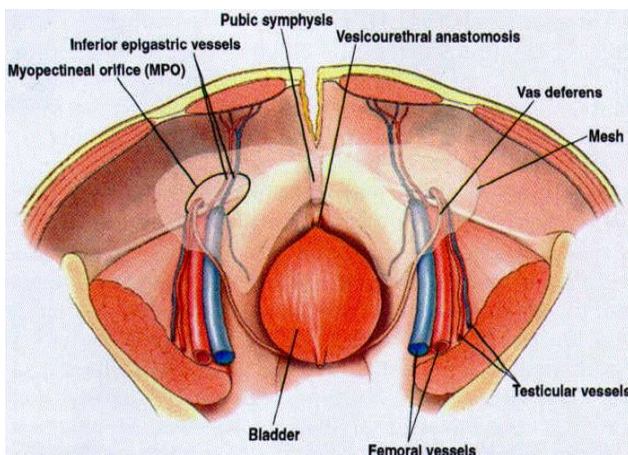
Vertical length: (Distance between umbilicus and pubic Symphysis - 3 cm)

The mesh is placed in the pre-peritoneal space, is then fixed with the cooper's ligament at the pubic ramus 3 cm medial from the edge with prolene 2-0, so as to support the lowermost aspect of the pre-peritoneal content and patient is then put to Trendelenburg position to facilitate exposure, then the mesh is spread out such that it is held in place without the need for further fixation since the intra-abdominal pressure forces the mesh to lay flat between the peritoneum and the layers. Peritoneum is reflected up to 5-6 cm over triangle of doom. Mesh covers Myopectineal orifice and all the other hernia sites.



**Figure:** Placement of mesh prosthesis

With this giant prosthetic reinforcement of the visceral sac (GPRVS), the mesh acts as an artificial endo-abdominal fascia and prevents visceral sac extension through the myopectineal orifice. [2]



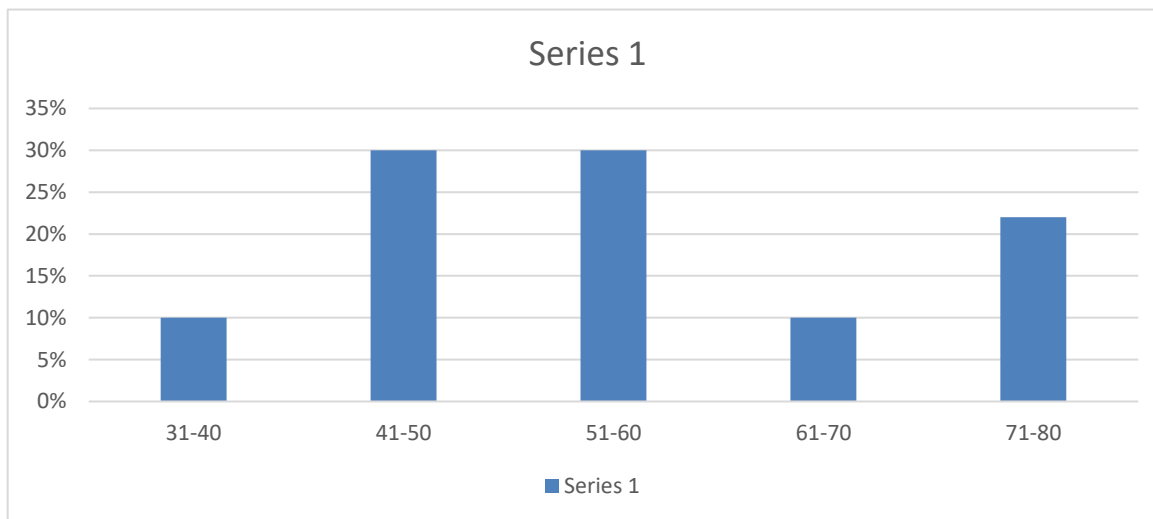
**Figure:** prosthetic mesh covering myopectineal orifice.

All patients in post-operative period were monitored for pain, early ambulation, subjected to daily sterile dressing and were discharged after 4-5 days. All patients were followed up in Surgical OPD had their skin stitches removed after 10-12 days. All have been in close follow up for last 2 months and this study plans to keep patients in follow up for further 10 months to look for any incidence of chronic inguinodynia or recurrence of hernia.

**RESULTS**

A total of 10 bilateral inguinal hernias were repaired. All 10 were male. The mean age of patients was 56.1 years (range, 37 to 74). Five patients were older than 56 years, including 2 older than 70 years (Figure 1). Concomitant medical problems were observed in 6 patients (60%). Hypertensive diseases were the most frequent (3 cases), followed by pulmonary diseases (1 case of asthma with chronic cough) and 1 case of epilepsy. Risk factors predicating a high risk for recurrence included hernia size (>2 cm) in 40% (4 of 10).

**Figure:** Age distribution in 10 patients who underwent Stoppa’s groin hernia repair.

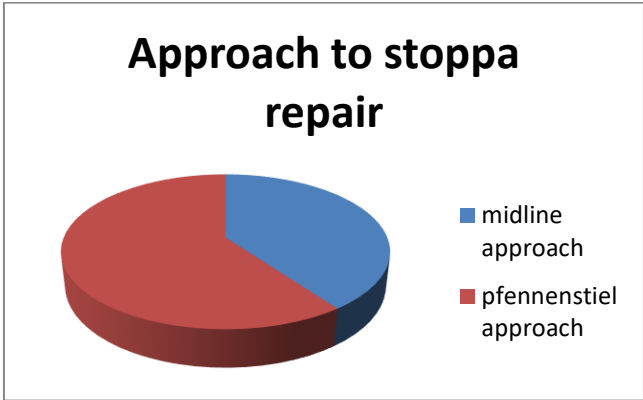


- GPRVS was completed in all 10 patients, and no patient required conversion to another technique. Bilateral GPRVS was used in 10 patients to repair 20 hernias, of which all 18 were primary direct inguinal hernia and 2 were primary indirect inguinal hernias. (Table 1)

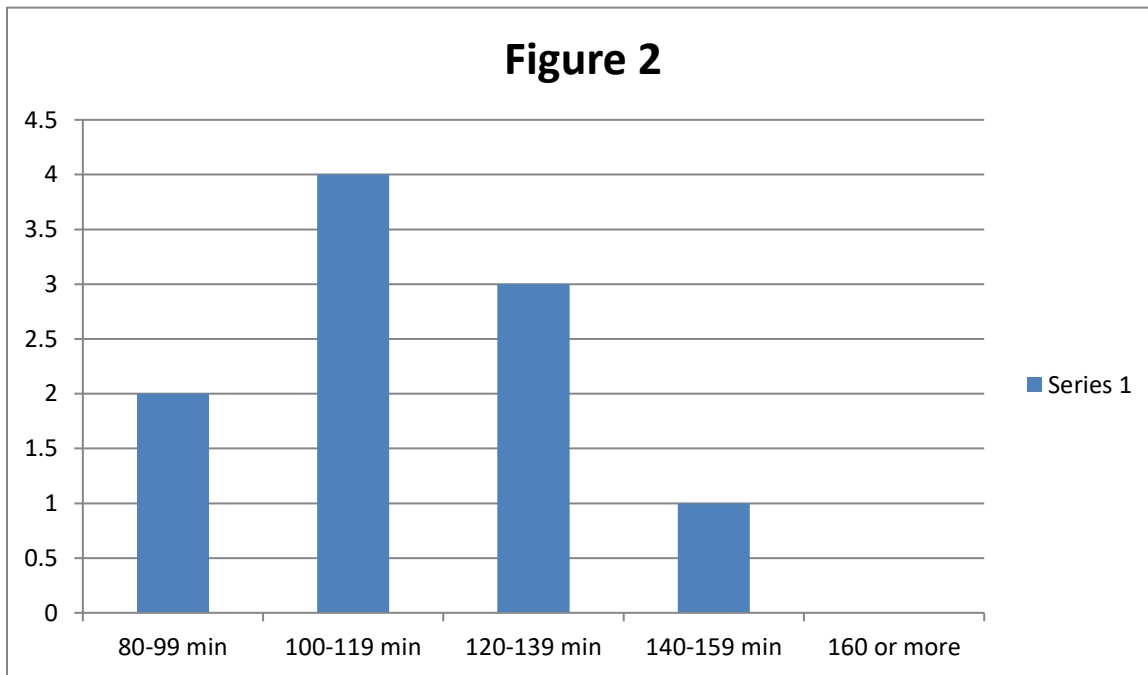
**Table 1:** Type of groin hernias in 10 patients with stoppa’s groin hernia repair.

|                                                           | Type of | Number |
|-----------------------------------------------------------|---------|--------|
| <b>inguinal hernias</b>                                   |         |        |
| Bilateral indirect inguinal hernia                        |         | 0      |
| Bilateral direct inguinal hernia                          |         | 8      |
| Bilateral inguinal hernia (right: direct, left: indirect) |         | 1      |
| Bilateral inguinal hernia (right: indirect, left: direct) |         | 1      |
| Femoral hernia                                            |         | 0      |
| Obturator hernia                                          |         | 0      |

General anesthesia was used in 2 cases and spinal anesthesia in 8 cases. 4 cases were operated via the vertical midline approach and 6 patients were operated via Pfannenstiel approach.



- The mean operative time was 115.2 minutes [range 80-155] (Figure 2), being 124.75 min in those via vertical midline approach and 111.75 min in those via Pfannenstiel approach and there was no complication related to anesthesia.



**Figure:** Mean operative time in 10 patients with Stoppa's inguinal hernia repair.

**Post-op Stay:**

- Average post op stay of the patient was 6.79 days ranging from 5 days to 17 days (Figure 3).

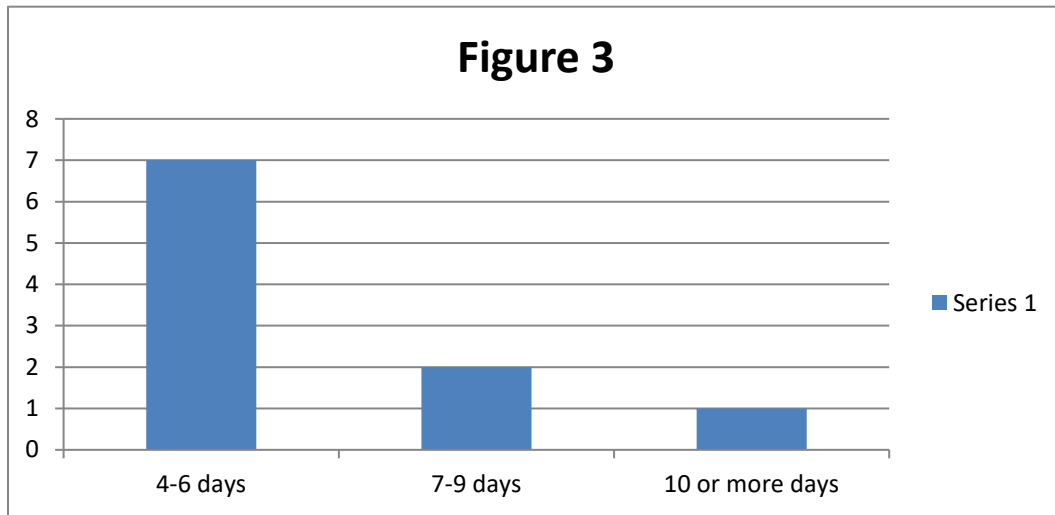


Figure: Distribution of Average post-op Stay.

**Post-op Pain Scale:**

- Post operatively, 8 patients had no post-op pain after post op day 2; two patients had lower abdominal pain relieved after bowel movement. On post-op day 4 no patient had significant clinical pain.

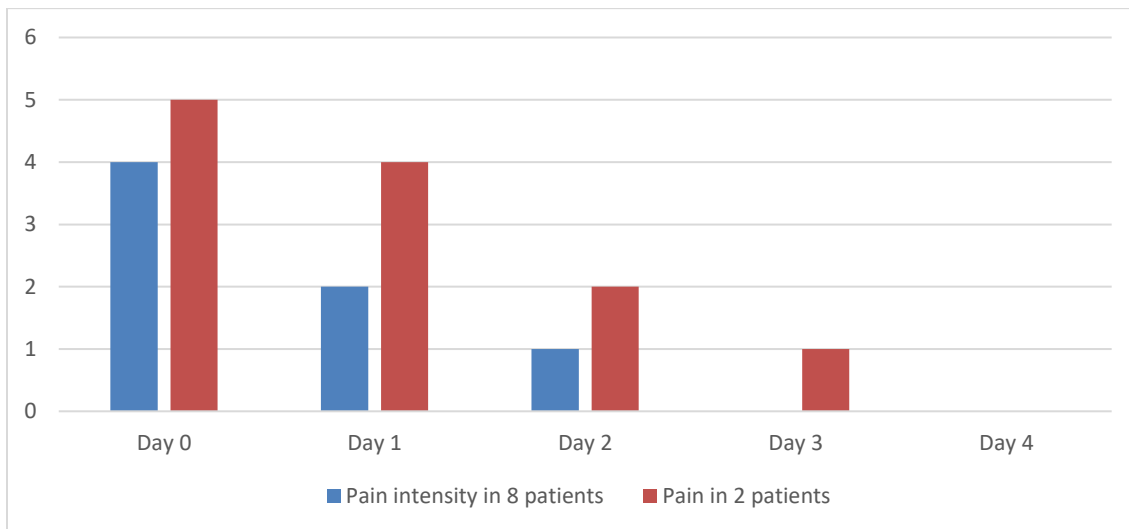


Figure: Pain scale distribution in post-op period.

- Of all patients undergoing stoppa's repair, none of the patient developed hematoma, one patient developed seroma formation, and one patient developed surgical site infection. Incidence of post-op Urinary Retention could not be evaluated as all patients were catheterized pre-operatively.
  
- On 3 months follow up, mesh migration or mesh infection was not seen in any of them. None of them developed chronic inguinodynia and there was no incidence of recurrence of hernia.[8]

| Post-op Complication               | Number |
|------------------------------------|--------|
| Hematoma                           | 0      |
| Seroma Formation                   | 1      |
| Surgical Site infection            | 1      |
| Chronic Inguinodynia over 2 months | 0      |
| Mesh Migration                     | 0      |
| Mesh Infection                     | 0      |
| Recurrence(min 6 months follow-up) | 0      |

**Table 2:** Incidence of post-operative complication in patients undergoing stoppa's repair.

## DISCUSSION:

Inguinal hernia and its management have continued to remain the throne to the surgeons. Hernia repair and its failure keep troubling the patient and humiliating the surgeon.

Advantages of pre-peritoneal prolene mesh hernioplasty:

- Permits inspection of all potential abdominal hernia sites.
- Tensionless and suture less repair in its true sense.

- This space is a virgin space typically intact during repair of recurrent hernias which greatly facilitates the procedure.
- Reduces the risk of nerve injury, neuralgia, orchitis, testicular atrophy and chronic pain as observed in the pain scale distribution

Modifications in approach to stoppa's repair and its advantages:

### 1. Pfannenstiel over Midline approach:

- Cosmetically better scar.
- Better exposure of myopectineal orifice.
- Lesser Operative time period.



**2. Midline over Pfannenstiel approach:**

- Incision can be extended for wider pre-peritoneal space.
- Lesser post-op pain as abdominal wall muscles are not cut.

**Learning Curve:**

Some studies states that Stoppa's repair is technically difficult and not for everyone, however in our experience it is simple with a short learning curve, approximately after assisting 5-7 surgeries. Comparing this to the laparoscopic pre-peritoneal repair where the learning curve is steep with estimated 40-50 cases. We believe that GPRVS can be practiced safely after a short and effective learning curve.

**Financial support and sponsorship:** Nil

**Conflict of Interest:** None

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