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Research Article

Our Experience of Stoppa's Repair: A Prospective Study of 50 Cases

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ABSTRACT
Background: Stoppa's repair, also known as Giant Prosthetic Reinforcement of the Visceral Sac (GPRVS), is a tension-free, sutureless preperitoneal mesh repair based on the hydrostatic principle of Pascal. It offers single-mesh coverage of all potential hernial orifices in the lower abdomen through a single midline incision.
Objectives: To study the outcomes, complications, and efficacy of Stoppa's repair in patients presenting with bilateral inguinal hernias at a tertiary care centre.
Methods: A prospective observational study was conducted from January 2024 to April 2025 at the Department of Surgery, Government Medical College and Hospital, Cuddalore District. Fifty patients with bilateral inguinal hernias were included. Operative parameters, hospital stay, and complications were recorded.
Results: The mean operative time was 72 minutes (range 40–115 min). Mean hospital stay was 5.9 days (range 4–13 days). Intraoperative bladder injury occurred in 1 patient (2%), managed with 2-0 Vicryl repair and suprapubic catheter. Postoperative wound infection was observed in 5 patients (10%), all successfully treated with antibiotics. No recurrence was noted during the follow-up period.
Conclusion: Stoppa's repair is a safe, effective, and reproducible technique for bilateral inguinal hernias. A single large mesh covers all hernial defects simultaneously, making it an ideal approach for bilateral and recurrent hernias. Our outcomes support its continued use in tertiary surgical centres.

Keywords: Stoppa's repair, GPRVS, bilateral inguinal hernia, preperitoneal mesh, hernia recurrence

1. INTRODUCTION

Inguinal hernia repair is one of the most commonly performed surgical procedures worldwide. Bilateral inguinal hernias present a therapeutic challenge, requiring simultaneous or staged repair of both groins. Conventional anterior approaches such as Lichtenstein's tension-free hernioplasty are reliable for unilateral hernias but become technically demanding and potentially morbid when applied bilaterally, especially in the context of recurrent hernias or previous anterior repairs.

René Stoppa introduced the concept of Giant Prosthetic Reinforcement of the Visceral Sac (GPRVS) in the 1980s. This technique involves placing a large prosthetic mesh in the preperitoneal space through a single midline subumbilical incision, covering all potential hernial orifices simultaneously-including direct, indirect, femoral, obturator, and perineal hernias. The repair is sutureless and relies on the hydrostatic pressure principle described by Blaise Pascal, wherein increased intra-abdominal pressure serves to hold the mesh in place rather than displace it.

The advantages of Stoppa's repair include avoidance of scarred tissue in recurrent hernia cases, complete visualisation of anatomical

landmarks such as Cooper's ligament, the iliopubic tract, and the femoral sheath, and the ability to address seven pairs of hernial orifices with a single prosthesis. Despite the advent of laparoscopic hernia repair, Stoppa's technique retains its clinical relevance, particularly in centres with limited laparoscopic resources or in complex bilateral and recurrent hernia scenarios.

This study was undertaken to evaluate our institutional experience with Stoppa's repair, with specific focus on operative parameters, postoperative complications, and recurrence rates.

2. OBJECTIVES

- To assess the outcomes of Stoppa's repair (GPRVS) in patients with bilateral inguinal hernias.
- To evaluate intraoperative and postoperative complications.
- To determine hospital stay duration and rates of wound infection and hernia recurrence.

3. MATERIALS AND METHODS

3.1 STUDY DESIGN AND SETTING

A prospective observational study was conducted from January 2024 to April 2025 in the Department of General Surgery, Government Medical College and Hospital, Cuddalore District, Tamil Nadu, India.

3.2 INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA: All adult patients (age ≥18 years) admitted with bilateral inguinal hernias, including direct, indirect, and recurrent types, who were fit for surgery under general or spinal anaesthesia.

EXCLUSION CRITERIA: Patients with unilateral inguinal hernias, those unfit for surgery, patients with active infection or ascites, and those who declined consent for the procedure.

3.3 SAMPLE SIZE

A total of 50 patients satisfying the inclusion criteria were enrolled consecutively over the study period.

3.4 SURGICAL TECHNIQUE

All patients underwent Stoppa's repair under general or spinal anaesthesia by a single experienced surgical team. The standard steps performed were:

- **STEP 1:** Skin incision-subumbilical midline or Pfannenstiel incision.
- **STEP 2:** Preperitoneal dissection to create space for mesh placement.
- **STEP 3:** Management of hernia sac (reduction or ligation as appropriate).
- **STEP 4:** Management of any associated abdominal wall defect.
- **STEP 5:** Parietalization of the spermatic cord.
- **STEP 6:** Placement of a large prosthetic mesh (polypropylene, minimum 30 × 27 cm) in the preperitoneal space.
- **STEP 7:** Layered closure of the wound.

Antibiotic prophylaxis with intravenous cefazolin 1g was administered 30 minutes before skin incision. A urinary catheter was placed intraoperatively and removed at 24 hours unless a bladder complication necessitated prolonged drainage.

3.5 DATA COLLECTION AND FOLLOW-UP

Data were recorded prospectively on a structured proforma. Parameters collected included patient demographics, type and classification of hernia, operative time, intraoperative findings and complications, duration of hospital stay, wound status at discharge, and recurrence at follow-up visits (at 1 month, 3 months, and 6 months postoperatively).

Table No. 1: Distribution of Hernia Types in Study Population (n = 50)

Type of Hernia	No. of Patients	Percentage (%)
Recurrent hernia	18	36.0
Bilateral indirect inguinal hernia	19	38.0
Bilateral direct inguinal hernia	8	16.0
Mixed (direct + indirect)	5	10.0
Total	**50**	**100.0**

4. RESULTS

4.1 PATIENT DEMOGRAPHICS

Fifty patients were enrolled between January 2024 and April 2025. All patients were male. The age range was 30 to 78 years, with a mean age of 52.4 ± 11.2 years. All patients presented with bilateral inguinal hernias; hernia type distribution is shown in Table 1. The most common presentation was bilateral indirect inguinal hernia (38%), followed by recurrent hernia (36%).

4.2 OPERATIVE FINDINGS

The mean operative time was 72 minutes (range 40-115 minutes). All operations were completed without conversion. A large polypropylene mesh (minimum 30 × 27 cm) was used in all patients. Parietalization of the spermatic cord was achieved satisfactorily in all cases. Intraoperative bladder injury occurred in 1 patient (2%), which was identified immediately; repair was performed using 2-0 Vicryl sutures and a suprapubic catheter was placed, with uneventful recovery thereafter.

4.3 POSTOPERATIVE OUTCOMES

The mean hospital stay was 5.9 days (range 4-13 days). Wound infection was observed in 5 patients (10%) in the postoperative period. None of these were deep or mesh infections; all were superficial surgical site infections managed successfully with wound care and antibiotics. No other major complications (e.g., haematoma, seroma requiring drainage, mesh rejection) were recorded. No mortality was observed.

Table No. 2: Summary of Postoperative Outcomes (n = 50)

Parameter	Finding
Mean operative time	72 min (range 40–115 min)
Mean hospital stay	5.9 days (range 4–13 days)
Intraoperative bladder injury	1 (2.0%)
Wound infection	5 (10.0%)
Mesh-related complications	None
Mortality	None
Recurrence (follow-up period)	None

4.4 FOLLOW-UP

Patients were followed up at 1 month, 3 months, and 6 months postoperatively. No recurrence of hernia was detected during the follow-up period in any of the 50 patients.

5. DISCUSSION

Stoppa's repair represents an elegant application of anatomical and biomechanical principles to hernia surgery. The technique takes advantage of the vast preperitoneal space and the natural tendency of intra-abdominal pressure to hold a large prosthesis firmly against the posterior abdominal wall. By covering the entire myopectineal orifice of Fruchaud with a single large mesh, all potential hernial orifices are reinforced simultaneously, making it particularly suited to bilateral and recurrent hernias.

In our series of 50 patients, the mean operative time of 72 minutes compares favourably with published series. Amid *et al*. reported mean operative times of 65-85 minutes for bilateral cases. The principal intraoperative complication in our study was bladder injury in 1 patient (2%), consistent with the reported incidence of 1–3% in most series. Bladder injury during Stoppa's repair is attributed to dense adhesions in the space of Retzius, particularly in cases with previous lower abdominal surgeries or catheterisation history. In our case, immediate intraoperative recognition and primary repair with catheter drainage resulted in complete recovery.

Wound infection was observed in 5 patients (10%). This rate is somewhat higher than the 3-6% reported in some earlier series but is comparable to reports from centres in similar resource settings. All infections were superficial and resolved with conservative management. No deep or mesh infections were encountered. The absence of mesh infection is of particular significance, as deep mesh infection would necessitate prosthesis removal and represent a major setback to the repair.

The mean hospital stay of 5.9 days reflects the resource setting of a government tertiary care hospital, where a period of supervised postoperative observation is routine. In high-income settings, day-case and 23-hour protocols have been reported for Stoppa's repair, though such workflows require robust outpatient infrastructure.

Recurrence is the most important long-term outcome in hernia surgery. The zero-recurrence rate in our series, while observed over a medium-term follow-up, is consistent with the established efficacy of GPRVS. The large surface area of preperitoneal mesh coverage, combined with its tension-free nature, is believed to account for the low recurrence rates reported with this technique (0-3% in large series). Longer-term follow-up is planned to confirm durability.

A significant advantage of Stoppa's approach over bilateral Lichtenstein repair is the avoidance of bilateral groin dissection and the risk of injury to the ilioinguinal and iliohypogastric nerves, which are associated with chronic groin pain in 10-12% of patients undergoing anterior mesh repair. Furthermore, in the recurrent hernia subset-which constituted 36% of our cohort-the posterior preperitoneal route avoids the scarred anterior tissue planes entirely, reducing operative risk and the likelihood of damage to the vas deferens and testicular vessels.

6. CONCLUSION

Stoppa's repair (GPRVS) is a safe, effective, and reproducible procedure for bilateral inguinal hernias, including those that are recurrent. A single large mesh placed in the preperitoneal space provides comprehensive coverage of all lower abdominal hernial orifices through a single midline incision. In our prospective series of 50 patients, the procedure was associated with an acceptable complication profile and no recurrence during the follow-up period. Wound infection, the most common postoperative complication, was superficial and amenable to conservative management. Stoppa's repair continues to be a valuable addition to the hernia surgeon's armamentarium, particularly in resource-limited settings and for complex bilateral or recurrent cases.

7. ETHICAL CONSIDERATIONS

The study was conducted in accordance with the principles of the Declaration of Helsinki. Institutional ethical clearance was obtained prior to commencement of the study. Written informed consent was obtained from all patients. Patient confidentiality was maintained throughout.

8. CONFLICTS OF INTEREST

The authors declare no conflicts of interest. No funding was received for this study.

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