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The Forgotten Stoppa Procedure: An Alternative Approach for Incarcerated Groin Hernia Following Prior Anterior Repair Unsuitable for Laparoscopic Surgery – Case Series

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Abstract

Incarcerated and recurrent inguinal hernias present complex surgical challenges, particularly in patients with a history of multiple anterior repairs or contraindications to laparoscopic approaches. Although minimally invasive techniques such as Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP) repair have become standard practice, not all patients are ideal candidates due to altered anatomy, dense adhesions, or comorbidities that preclude general anesthesia. In such cases, the Stoppa procedure—a classical open posterior approach with wide preperitoneal mesh placement—offers a safe and effective alternative. This case series describes two elderly male patients with incarcerated recurrent inguinal hernias following multiple prior anterior mesh repairs. Both presented in emergency settings with significant comorbidities, making laparoscopic surgery unfeasible. Surgical repair was performed using a lower midline incision and extensive preperitoneal dissection, followed by the placement of a large polypropylene mesh without extensive fixation. In both cases, the incarcerated ileal segments were viable and successfully reduced without bowel resection. Postoperative recovery was uneventful, with both patients discharged within three days and showing no recurrence or major complications during a one-year follow-up. These outcomes demonstrate that the Stoppa technique remains a valuable option in complex cases where anterior or laparoscopic approaches are unsuitable. Its anatomical logic, broad coverage, and reduced risk of chronic pain support its continued role in modern hernia surgery. Surgeons should retain proficiency in this underutilized yet highly effective method, particularly when managing high-risk or re-operative groin hernias.

Keywords: hernia, open repair, preperitoneal mesh, recurrent, Stoppa

Introduction

Incarcerated groin hernia is a common surgical emergency that requires prompt diagnosis and timely intervention to prevent serious complications such as strangulation, bowel ischemia, and sepsis. Traditionally, the anterior open approach—such as the Lichtenstein technique—has been widely used, while in recent years, laparoscopic techniques like Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP) have gained popularity due to their benefits in reducing postoperative pain, speeding recovery, and improving anatomical visualization (Andresen & Rosenberg, 2024).

However, the management of recurrent or incarcerated inguinal hernias—especially in patients with a history of previous anterior repair—remains technically challenging. These challenges arise from altered anatomy, dense adhesions, and scarring, which increase the risk of iatrogenic injury. Additionally, multiple prior surgical failures often result in patients being referred to other institutions with incomplete documentation, further complicating management. The recurrence rate following primary inguinal hernia repair ranges from 0.5% to 15%, depending on factors such as hernia type, surgical method, and patient condition. Although mesh usage has helped reduce recurrence, this problem persists and remains a significant health burden (Barrat et al., 2023; EU Hernia Trialists Collaboration, 2022; Magnusson et al., 2020).

According to the European Hernia Society, recurrent hernias should be repaired via the opposite approach to the initial

surgery—posterior if the previous repair was anterior, and vice versa. While laparoscopic posterior repairs are often preferred, not all patients are suitable candidates due to comorbidities or physiological instability. In such cases, an open posterior approach becomes necessary. One such method is the Stoppa procedure, a preperitoneal approach introduced in the 1970s, which allows wide exposure of the myopectineal orifice and tension-free placement of a large mesh. Initially intended for bilateral or recurrent hernias, this technique has become underutilized with the advent of minimally invasive surgery (Lee et al., 2019; Simons et al., 2019).

Despite its advantages, the Stoppa procedure has been largely forgotten among surgeons and is rarely discussed in contemporary literature, especially in emergency settings where anterior or laparoscopic approaches are contraindicated. This represents a critical gap in surgical knowledge and practice. As recurrent and complex hernia cases continue to increase, re-evaluating and reintroducing the Stoppa procedure is both timely and necessary. Through this case series, we aim to remind surgeons of this valuable technique and emphasize its relevance, safety, and practicality as an alternative approach in managing incarcerated groin hernias in patients for whom conventional methods are unsuitable. We believe the Stoppa procedure should remain an essential part of the hernia surgeon's armamentarium

Case Presentation

Case 1

A 65-year-old male presented to the emergency department with a lump in the left inguinal region that had been present for approximately 2.5 years and had become incarcerated for five days prior to admission. The patient had a history of four previous inguinal hernia repairs—two on the right side and two on the left—performed at another institution using the anterior approach with mesh implantation. Due to the patient's significant cardiac comorbidities, which posed a high risk for general anesthesia, and considering the previous surgeries were all performed via the anterior route, we opted for an emergency open posterior repair using the Stoppa technique. Intraoperatively, we found an incarcerated left inguinal hernia containing a viable segment of the ileum. Hernia repair was performed based on the principles of the Rene Stoppa procedure, involving the placement of a large prosthetic mesh in the preperitoneal space (Figure 1). The patient had an uneventful recovery and was discharged on the third postoperative day with a Clavien-Dindo grade I classification.

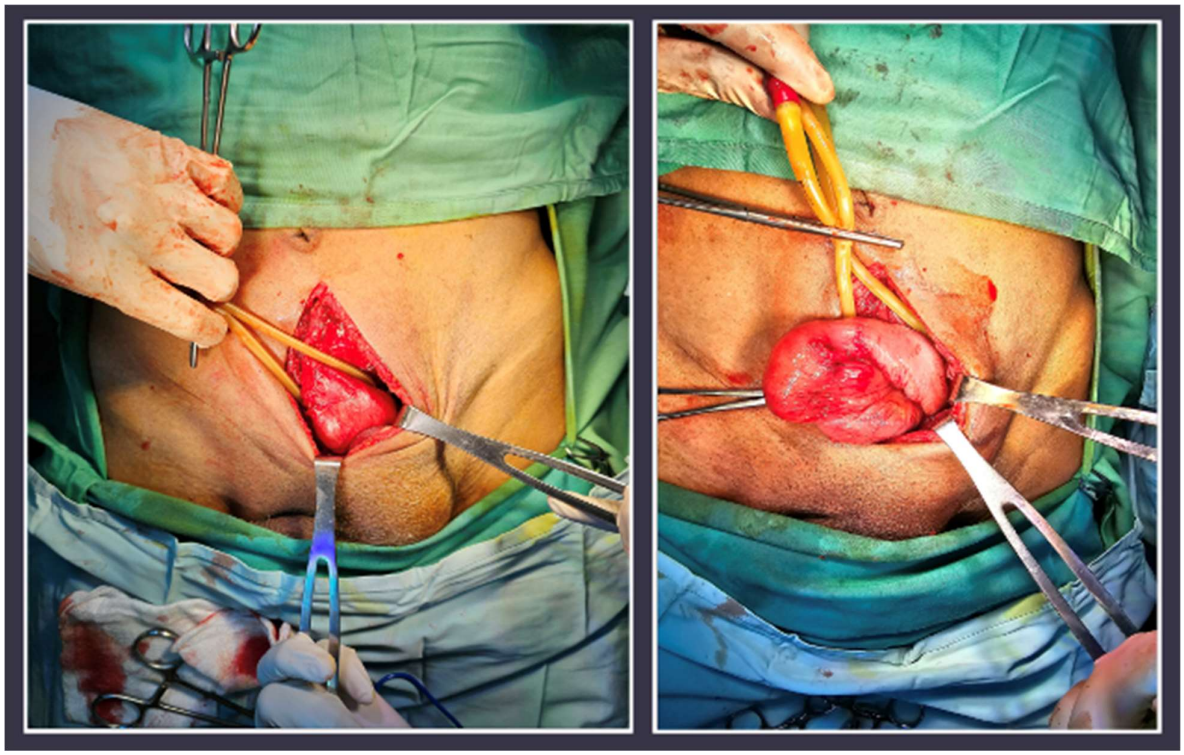

Figure 1. (A) Isolation of the hernia sac in the preperitoneal area. (B) The hernia sac is opened, revealing a viable ileum inside.

Case 2

The second patient, a 66-year-old male, presented with a right inguinal mass that had been present for 1.5 years and had become incarcerated for three days prior to admission. He had previously undergone two hernia repair surgeries: one for a left inguinal hernia in 2013 and one for a right inguinal hernia in 2020, both using the anterior approach with mesh placement at another hospital. Given the presence of significant abdominal distension, which posed technical difficulties for laparoscopic repair, and the history of anterior repairs, we decided to proceed with an emergency open posterior hernia repair using the Stoppa technique. During the procedure, we identified an incarcerated right inguinal hernia containing a viable ileal segment. The hernia was repaired using the Rene Stoppa method, with mesh placement in the preperitoneal space, fixation with two sutures at the upper and lower midline, and bilateral placement of vacuum drains. The patient

recovered without complications and was discharged on the second postoperative day with a Clavien-Dindo grade I classification.

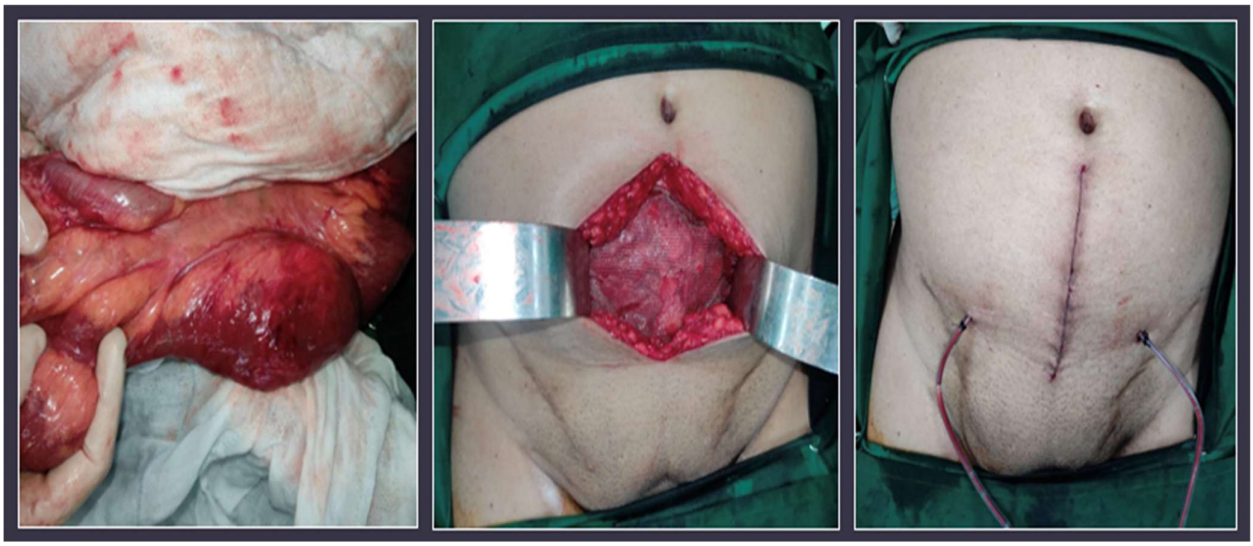

Figure 2. (A) Enterocele within the hernia sac, with viable bowel. (B) Placement of mesh in the preperitoneal area. (C) Vacuum drain positioned over the mesh.

Discussion

Hernia is derived from the Latin word "prolapse," with the earliest known documentation of inguinal hernias dating back to approximately 1552 BC in ancient Egypt. In the 20th century, Henry Fruchaud significantly advanced the anatomical understanding of groin hernias by introducing the concept of the myopectineal orifice, which encompasses direct and indirect inguinal, femoral, obturator, and supravesical hernias. This comprehensive anatomical insight provided a foundational framework for developing various surgical repair techniques. Early approaches like Bassini's repair relied on tissue approximation and suture-based methods. Later, Lichtenstein's tension-free mesh repair via the anterior approach became the gold standard due to its simplicity and effectiveness. Concurrently, René Stoppa revolutionized the posterior approach by introducing the preperitoneal mesh repair, which offered an effective solution for complex and bilateral hernias and ultimately laid the foundation for modern laparoscopic techniques such as TAPP (Transabdominal Preperitoneal) and TEP (Totally Extraperitoneal) procedures (Amid, 2024; Elsebae et al., 2018; Hori & Yasukawa, 2021; Miller, 2018).

Despite advances in minimally invasive surgery, specific clinical scenarios limit the applicability of laparoscopy. These include patients with multiple prior anterior hernia repairs, in whom dense scarring and altered tissue planes pose a high risk of injury to critical structures such as the spermatic cord, epigastric vessels, or bladder. Additionally, comorbid conditions—particularly severe cardiac or pulmonary diseases—may contraindicate the use of general anesthesia required for laparoscopic access. In such cases, the Stoppa procedure can be safely applied not only for bilateral but also for unilateral hernias, particularly when previous anterior repair or scarring is present. This open preperitoneal approach becomes a valuable and safer alternative, offering access through virgin tissue planes and the possibility of regional anesthesia (Buia et al., 2020; Mcmahon & Kehdy, 2021; Radkowski et al., 2024).

As depicted in Figure 3, the Stoppa technique employs a wide preperitoneal dissection via a lower midline incision, allowing the placement of a large, anatomically contoured prosthetic mesh. The mesh, measuring approximately 24 × 16 cm with a central notch, is designed to cover the entire myopectineal orifice bilaterally. This ensures comprehensive reinforcement of all potential hernia sites—inguinal, femoral, and obturator—while avoiding previously operated anterior fields. The figure also illustrates the mesh position in cross-sectional anatomy and optional vacuum drain placements used to prevent seroma formation following extensive preperitoneal dissection. This configuration facilitates a tension-free, overlapping repair that respects the anatomical landmarks and reduces the risk of chronic pain (Hatewar et al., 2024; Rai et al., 2024).

In the two cases presented, the Stoppa procedure was chosen because both patients had a history of multiple anterior hernia repairs with mesh placement, making further anterior or laparoscopic dissection high-risk. The wide preperitoneal exposure allowed secure mesh placement through unscarred planes and minimized the risk of injury to scarred tissues, even in unilateral cases. The first patient, a 65-year-old male, had significant cardiac comorbidity— cardiomegaly identified on chest X-ray, with no additional cardiac abnormalities noted—which increased the perioperative risk for general anesthesia. The second, a 66-year-old male, showed marked abdominal distension that rendered laparoscopic access hazardous. Due to these limitations, both patients were managed using emergency open posterior hernia repair via the Stoppa technique. This approach allowed for safe dissection away from scarred fields and facilitated hernia reduction through untouched anatomical planes (Raheem et al., 2022; Rai et al., 2024).

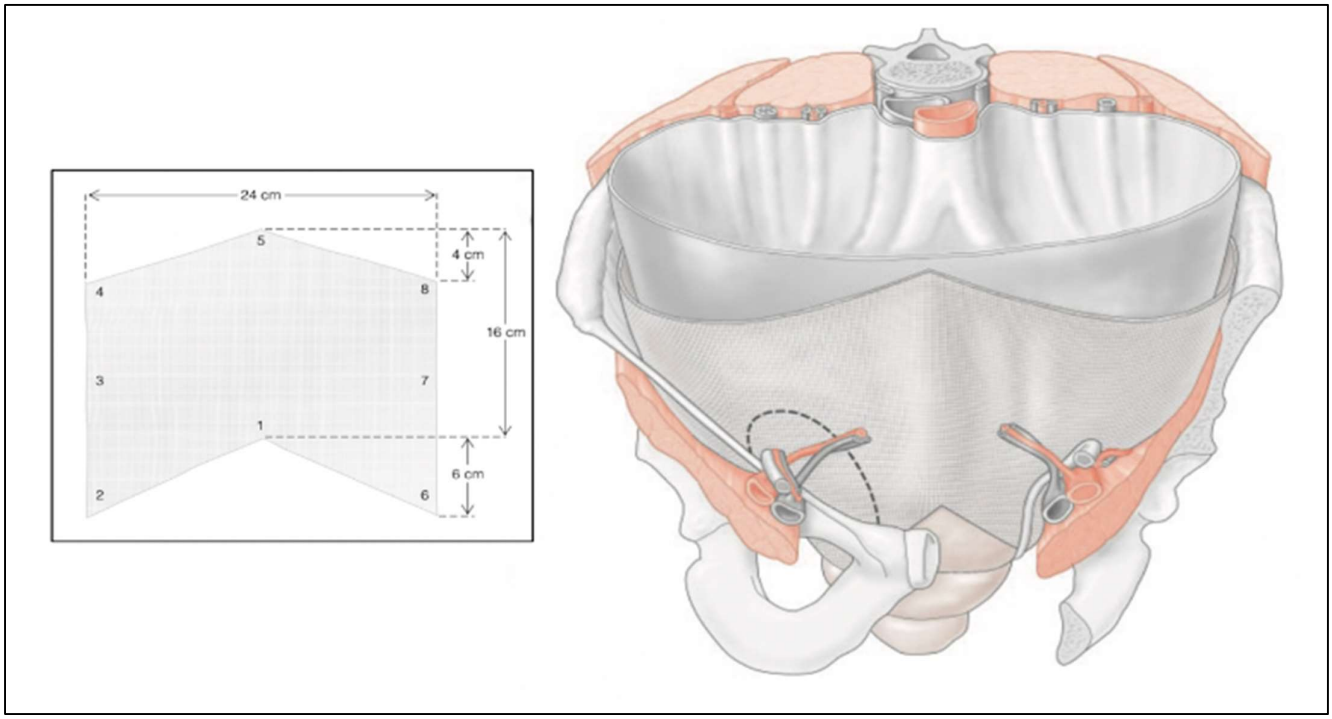

Figure 3. A. Shape of hernia mesh; B. Position of hernia mesh. This image illustrates The Stoppa procedure, with a large mesh placed in the preperitoneal space to cover the entire myopectineal orifice. This technique is effective for treating bilateral or recurrent hernias, especially in patients unsuitable for laparoscopic surgery

Intraoperative findings confirmed incarcerated but viable ileal loops in both patients. Wide preperitoneal dissection was achieved, and a large polypropylene mesh was placed without tension, fixated at the midline to reduce the risk of nerve entrapment. In one case, bilateral vacuum drains were inserted to minimize fluid accumulation. The duration of surgery averaged 90–100 minutes, comparable to standard anterior hernia repair, owing to the surgical team's experience and straightforward anatomical exposure. All procedures were performed by a board-certified digestive surgery subspecialist, ensuring adherence to advanced surgical standards and optimal patient safety. The Stoppa technique enabled complete coverage of the bilateral myopectineal orifice with minimal manipulation of the cord structures, reinforcing its value in complex groin hernias where laparoscopic or repeated anterior repairs are contraindicated (Joseph, 2022; Rai et al., 2024).

Postoperative outcomes were favorable. Both patients demonstrated good wound healing without infection, hematoma, or seroma formation, achieving complete epithelialization within four weeks. Early oral intake was tolerated within 24 hours, and patients achieved early ambulation. Despite the extensive dissection involved in the Stoppa procedure, postoperative management was similar to standard hernia surgery. Because there were no complications and pain was well controlled, both patients were safely discharged within 2–3 days. Both patients had an uneventful postoperative course.

The strength of the Stoppa approach lies in its capacity to offer broad, durable coverage of potential hernia sites while avoiding the pitfalls of previous surgeries. Minimal mesh fixation decreases the risk of chronic postoperative pain, and the technique allows for early mobilization and short hospital stays. It is particularly advantageous in elderly or comorbid patients who may not tolerate longer procedures or general anesthesia. Moreover, its application in emergency settings has proven effective, as demonstrated by the uneventful recovery and Clavien-Dindo grade I outcomes in both cases (Rai et al., 2024; Wang et al., 2020; Wassenaar et al., 2019).

In conclusion, although laparoscopic hernia repair is now a widely adopted standard for primary and some recurrent hernias, the Stoppa procedure retains significant value in selected cases. These include complex, bilateral, recurrent, or incarcerated hernias, especially in patients with prior anterior repairs or contraindications to general anesthesia. Our findings reaffirm that even in unilateral cases with prior anterior mesh repair or significant comorbidities, the Stoppa procedure provides a safe, effective, and adaptable option. As demonstrated in Figure 1, the anatomical logic and strategic mesh placement of the Stoppa method provide comprehensive reinforcement, justifying its continued inclusion in the hernia surgeon's repertoire—not as a forgotten procedure but as a timeless and indispensable technique.

Patient consent

Consent forms were obtained from the patient's parent, who agreed to the use of clinical information and images, with the assurance that the patient's identity would be kept confidential. No identifying details were published, and all necessary steps were taken to maintain anonymity.

Conflict of Interest

The authors confirm that they have no competing interests to disclose.

Author contribution

R.N. and M.S.F. contributed to the conception and design of the case report. M.S.F. was responsible for data collection, while R.N. prepared the initial draft of the manuscript. M.S.F. and T.L. provided critical feedback on earlier versions and contributed to revisions. R.N. finalized the formatting and editing of the manuscript. All authors have read and approved the final version of the manuscript.

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