Case Report

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A novel posterior approach using coated titanized polypropylene mesh repair for sacrococcygeal hernia: A case report and review of the literature

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Abstract

Sacrococcygeal hernia is a rare complication that may occur following coccygectomy or sacrococcygeal resection. Due to its rarity, optimal management strategies remain unclear, and only a few cases have been reported in the literature. We report a case of a 70-year-old female patient who developed a large sacrococcygeal hernia following en bloc sacral coccygectomy performed for a sacral chordoma. Six months after surgery, the patient presented with a progressively enlarging posterior sacral swelling associated with constipation and difficulty in ambulation. Magnetic resonance imaging demonstrated herniation of small bowel loops and sigmoid colon through the postoperative sacral defect. The patient underwent successful repair through a posterior sacral approach using a coated titanized polypropylene mesh placed in a bridging fashion. The postoperative recovery was uneventful, and the patient was discharged on the eighth postoperative day. Sacrococcygeal hernia remains a rare surgical entity with limited evidence guiding management. This case demonstrates that posterior approach repair using coated titanized polypropylene mesh is a feasible and effective technique for managing large sacrococcygeal defects while avoiding the morbidity associated with laparotomy.

Keywords:

Coated titanized mesh repair, posterior approach, sacral defect, sacrococcygeal hernia

Introduction

Sacrococcygeal hernia is an uncommon clinical entity characterized by protrusion of abdominal or pelvic viscera through a defect in the sacrococcygeal region. It most commonly occurs as a postoperative complication following coccygectomy or sacrococcygeal resection.[1] Due to the rarity of this condition, the optimal surgical management remains poorly defined.

The literature reports only a limited number of cases worldwide. Various surgical approaches have been described, including transabdominal, trans-sacrococcygeal, and combined approaches. Reconstruction of the sacral defect may involve primary closure, mesh repair, or soft-tissue flaps.[1]

We present a rare case of sacrococcygeal hernia following sacral coccygectomy that was successfully repaired via a posterior sacral approach using coated titanized polypropylene mesh. To our knowledge, this represents one of the first reported cases of sacrococcygeal hernia repaired via a trans-sacral approach using coated titanized polypropylene mesh.

Case Report

A 70-year-old female patient with a 7-year history of diabetes mellitus and hypertension, controlled with oral

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medications, presented in 2021 with lower back pain of 6 months' duration. Clinical examination revealed a bony swelling measuring approximately 10 cm × 8 cm in the sacral region, with overlying dilated veins but no distal neurovascular deficits. Abdominal examination showed vague lower abdominal fullness. Digital rectal examination demonstrated a large posterior rectal masswith intact overlying mucosa, causing near-total luminal compression. Magnetic resonance imaging (MRI) of the lumbosacral spine and pelvis revealed a destructive midline sacrococcygeal lytic lesion involving the left sacral ala at S1 level. Image-guided biopsy confirmed sacral chordoma.

The patient underwent surgery on November 2, 2021. An anterior approach via laparotomy allowed mobilization of the rectum from the mass, followed by osteotomy at the S1–S2 junction. The patient was then repositioned prone, and an en bloc sacrococcygectomy was performed. The dural sac was identified and ligated, and the sacral defect was reconstructed with an omental flap. The postoperative course was uneventful, and the patient was discharged on postoperative day 8.

Six months later, the patient presented with a progressively enlarging posterior sacral swelling, associated with constipation and difficulty in ambulation. On examination, a 30 cm × 20 cm swelling was noted, which was reducible and exhibited a positive cough impulse. MRI of the pelvis (April 3, 2023) demonstrated absence of the sacrum with a residual S1 vertebral body, along with herniation of small bowel loops and the sigmoid colon through the postoperative sacral defect, establishing the diagnosis of sacrococcygeal hernia. At the time of presentation for hernia repair, the patient had a body mass index of 23.5 kg/m^2. The preoperative MRI images demonstrating the sacrococcygeal hernia are shown in Figure 1.

The patient underwent posterior sacral hernia repair in the prone position on October 25, 2023. Following excision of the previous scar, the hernia sac was dissected and opened, and its contents were reduced into the abdominal cavity. Intraoperatively, small bowel loops along with the sigmoid colon were noted to be herniating through a 10 cm × 15 cm sacral defect, with adhesions to the subcutaneous tissue. A coated titanized polypropylene mesh (TiMESH™, pfm medical and Healthium, Nuremberg, Germany) was positioned in a bridging manner beneath the bone and secured to the margins of the defect using nonabsorbable No. 1 polypropylene sutures (Johnson & Johnson, USA), maintaining a fixed inter-suture distance of 2 cm. The intraoperative images of the sacrococcygeal hernia repair are shown in Figure 2. Layered wound closure was performed over a drain. The total operative duration, from incision to closure, was 2 h. The postoperative course was uneventful; the drain was removed on postoperative day 6, and the patient was discharged on postoperative day 8. The preoperative and postoperative images are shown in Figure 3. The patient was followed up for a period of 6 months. The clinical timeline illustrating disease progression and management is presented in Figure 4.

Discussion

Sacrococcygeal hernia is an exceptionally rare surgical entity characterized by the protrusion of intra-abdominal or pelvic contents through a defect in the sacrococcygeal region. It most commonly arises as a postoperative complication following procedures such as coccygectomy, sacral tumor resection, or extensive pelvic surgery. The sacrum and coccyx play a critical role in maintaining pelvic floor integrity; hence, their removal results in a structural defect that predisposes patients to posterior herniation of pelvic viscera.[1]

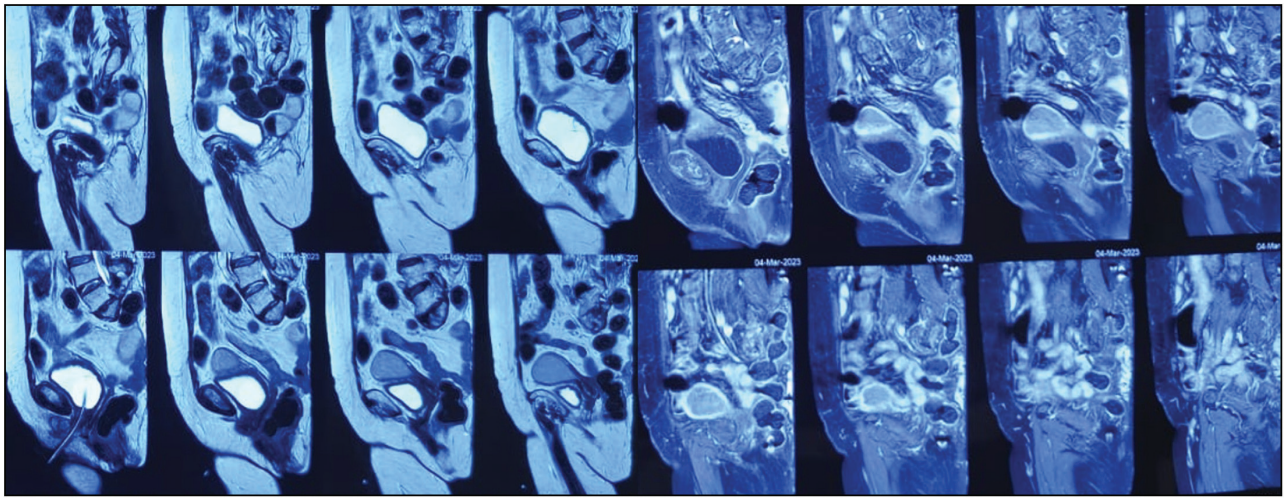


Figure 1: Preoperative magnetic resonance imaging (MRI) of the pelvis showing a sacrococcygeal defect. MRI demonstrates the absence of the sacrum with a residual portion of the S1 vertebral body. Herniation of small bowel loops and sigmoid colon is seen posteriorly through the postoperative sacrococcygeal defect

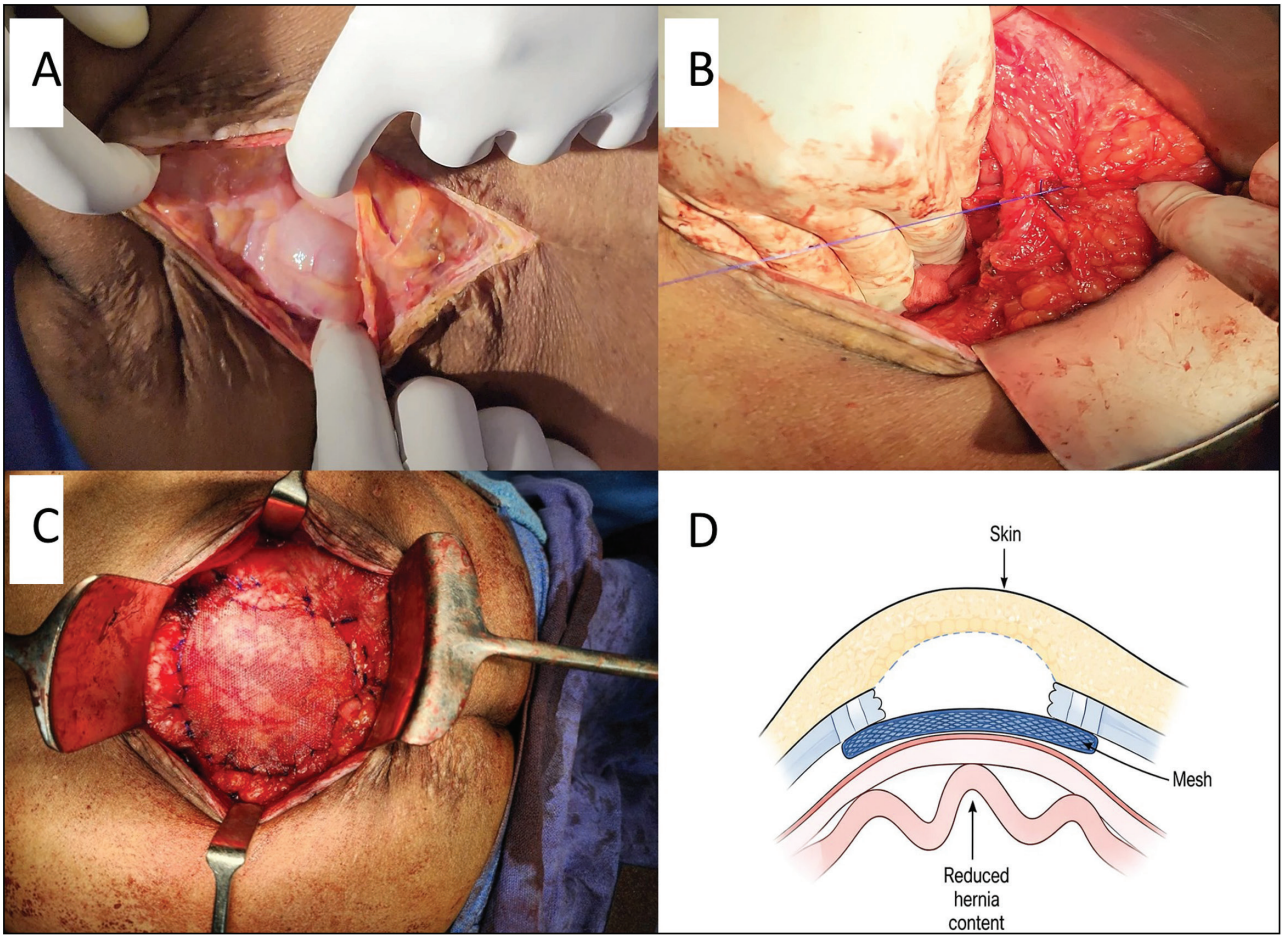


Figure 2: Intraoperative view of sacrococcygeal hernia repair. (A) Posterior sacral approach showing exposure of the hernia defect after dissection. (B and C) Herniated bowel loops were reduced, and a coated titanized polypropylene mesh was placed in a bridging fashion to reconstruct the sacral defect. (D) Graphical representation demonstrating placement of coated titanized mesh beneath the fascial layer to reinforce the sacrococcygeal defect

Owing to its rarity, the available literature is limited to isolated case reports and small case series, which restricts the development of standardized management guidelines. Early observations by García *et al*.[2] documented posterior rectal herniation following coccygectomy and underscored the importance of reconstructing the pelvic floor defect during the primary procedure itself. Likewise, Zook and Zook[3] described the successful repair of a chronic coccygeal hernia using local tissue reconstruction, highlighting both the technical challenges and the need for individualized surgical planning.

Given the limited number of reported cases, there is no universally accepted treatment strategy. Various techniques have been described, including primary herniorrhaphy, mesh repair, muscle transposition, and reconstruction using de-epithelialized musculocutaneous flaps [Table 1]. The choice of technique is largely dictated by the size of the defect, local tissue condition, and the presence of contamination or infection.

Multiple surgical approaches have been reported, including transabdominal, trans-sacrococcygeal (posterior), and combined approaches. The abdominal approach offers superior visualization of pelvic structures and facilitates safe reduction of herniated contents but is associated with the morbidity of laparotomy. In contrast, the posterior sacrococcygeal approach provides direct access to the defect, avoids intra-abdominal entry, and is particularly advantageous in cases with prior abdominal surgeries.[1]

Biological mesh reconstruction has also been explored as a viable option. Hoexum and Vuylsteke[10] reported a case of coccygeal hernia repair using a biological mesh placed via a sacral approach, with satisfactory outcomes. Although minor wound complications were noted, the patient remained symptom-free with no recurrence on follow-up imaging. The authors emphasized the scarcity of such cases in the global literature.[10]

In situations involving large defects or high risk of infection, alternative reconstructive techniques using vascularized tissue have been employed. These include gluteus maximus flaps, tensor fascia lata grafts, and rectus abdominis musculocutaneous flaps. While these

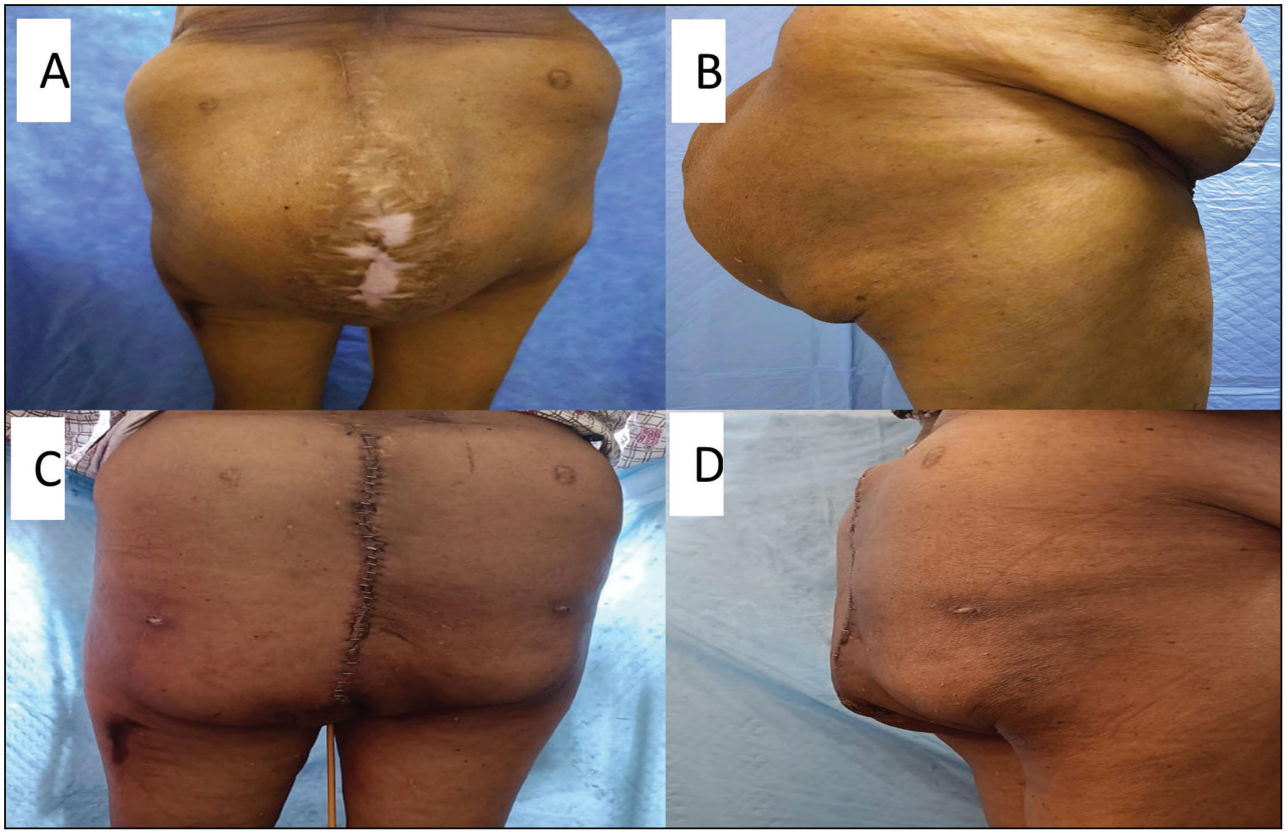


Figure 3: Preoperative and postoperative clinical photographs. (A) Preoperative posterior view showing large sacrococcygeal swelling. (B) Preoperative lateral view demonstrating the extent of the hernia bulge. (C) Immediate postoperative posterior view following mesh repair showing resolution of swelling. (D) Immediate postoperative lateral view demonstrating restoration of normal contour

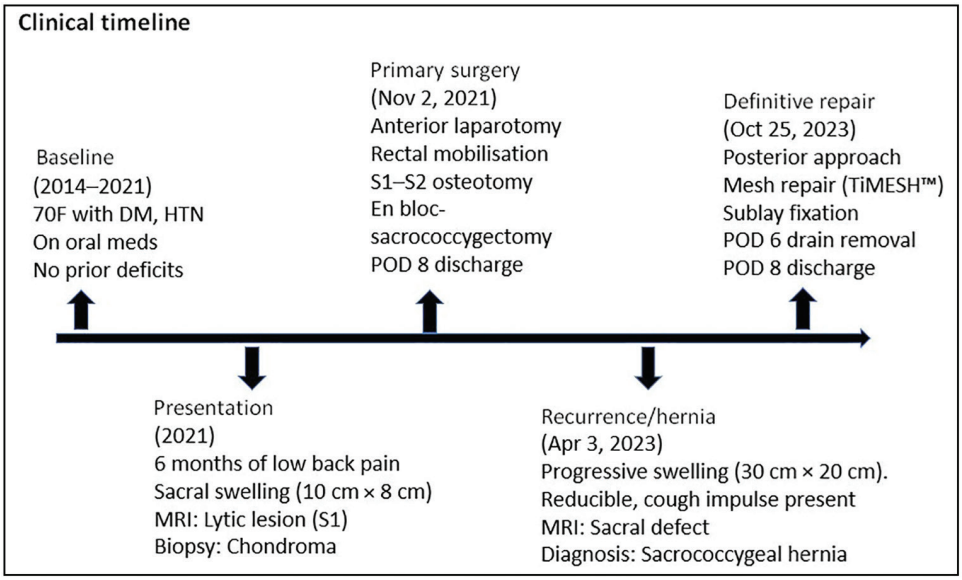


Figure 4: Clinical timeline depicting initial presentation of sacrococcygeal chondroma, surgical management, subsequent development of sacrococcygeal hernia, and definitive posterior mesh repair. POD, postoperative day; MRI, magnetic resonance imaging; DM, diabetes mellitus; HTN, hypertension

methods provide robust coverage and improved healing potential, they are technically demanding and associated with increased operative time and morbidity. Mesh-based repair has emerged as the preferred approach in recent literature due to its advantages, including tension-free closure, ability to bridge large defects, and reduced recurrence rates compared with primary repair.[1]

Despite these advancements, there remains no clear consensus regarding the optimal management of

Table 1: Review of the literature

Author	Gender	Age	Indication	Treatment	Success	Approach
Pagenstecher[4]	F	50	Coccygodynia	Herniorrhaphy	Yes	Sacral
Nichols[5]	M	38	Pain after trauma	Herniorrhaphy	Yes	Sacral
Zook and Zook[3]	F	42	Pain after trauma	First repair with mesh Second repair with mesh Third repair using gluteus maximus transposition	First repair: no—chronic wound and mesh dehiscence Second repair: no—infection Third repair: yes	Sacral
Balkenende *et al*.[6]	F	43	Block excision of the pilonidal sinus and coccyx	Herniorrhaphy	Yes	Sacral
García *et al*.[2]	F	43	Post-traumatic coccygodynia	Mesh (ePTFE)	Yes	Sacral
Kumar and Reynolds[7]	F	70	Sacrococcygeal arthritis	Mesh	Yes	Abdominal
Miranda *et al*.[8]	F	46	Coccygeal tumor	First repair: mesh Second repair: mesh Third repair: vertical rectus abdominis musculocutaneous flap	First repair: no—herniation Second repair: no—recurrence of hernia Third repair: yes	First repair: sacral Second repair: sacral Third repair: abdominal and sacral
Dugani *et al*.[9]	F	71	Coccygodynia	Mesh	Yes	Laparoscopic
Dong *et al*.[1]	F	54	Coccygeal tumor	Mesh	Yes	Laparoscopic + sacral
Hoexum and Vuylsteke[10]	F	34	Coccygodynia	Mesh (porcine)	Yes	Sacral

ePTFE = expanded polytetrafluoroethylene

sacrococcygeal hernias, largely due to the limited number of reported cases. Surgical decision-making is multifactorial, influenced by defect size, prior surgeries, patient comorbidities, and the risk of infection. In this case, considering the patient's advanced age and comorbidities, a strategy aimed at minimizing operative time was prioritized, thereby avoiding more prolonged procedures such as myocutaneous flap reconstruction. The presence of a large defect, prior sacral resection, and history of laparotomy favored a posterior approach with mesh reinforcement. A titanized mesh was selected to reduce the risk of infection and minimize bowel adhesions and their associated complications.

This case highlights the feasibility and effectiveness of repairing a large sacrococcygeal defect using a coated titanized polypropylene mesh placed in a bridging fashion via a posterior approach. Compared with previously described abdominal or combined approaches, this technique avoids laparotomy while allowing direct visualization and secure reconstruction of the pelvic floor. Given the rarity of this condition, each additional report contributes valuable insight toward establishing evidence-based guidelines for its management.

Conclusion

Sacrococcygeal hernia is a rare postoperative complication that typically occurs following sacral or coccygeal resections. To our knowledge, this is one of the first reported cases of sacrococcygeal hernia repair using a coated titanized mesh via a posterior approach. This technique offers an effective and relatively less invasive option for reconstructing large sacral defects, with a low risk of infection and bowel adhesion–related complications. Avoiding laparotomy may contribute to improved clinical outcomes.

Author contributions

All authors contributed significantly to this work. Concept and design: SY and NPJ. Data collection: SY, TPSS, and ARA. Surgical management: NPJ and SY. Manuscript drafting: SY, TPSS, and ARA. Critical revision and final approval: SY, NPJ, TPSS, and ARA.

Ethical policy and Institutional Review Board statement

The study protocol was approved by the Institutional Ethics Committee (IEC) of Government Medical College Kozhikode (IEC No.: GMCKKD/RP2026/IEC/100, date: June 25, 2026). This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Declaration of patient consent

Written informed consent for the publication of this case report and the accompanying images was obtained from the patient.

Data availability statement

The data supporting the findings of this study are available within the article. No additional datasets were generated or analyzed during this study.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Acknowledgement
The authors have no acknowledgements to declare.

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