

Giant Inguinoscrotal Hernia: Necrotizing Infection Complicating an Already Complicated Repair

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Background	A 67-year-old man presented to the emergency department with a symptomatic giant inguinoscrotal hernia.
Summary	<p>The patient presented to the emergency department with urinary retention. Examination revealed a neglected giant inguinoscrotal hernia (present for 15 years), predominantly affecting the right side. Imaging confirmed bladder entrapment within the hernia, causing obstruction. Segments of the colon, small bowel, and ureters were also herniated. Furthermore, the patient exhibited cellulitis of the scrotal skin.</p> <p>Initial management involved urinary decompression and antibiotic administration. However, the condition progressed to scrotal skin necrosis, necessitating immediate surgery. Due to the extensive tissue damage, several subsequent operations were required before definitive skin closure could be achieved.</p> <p>The patient in this case presented to the emergency department, reporting an inability to urinate. Upon examination, it was discovered that he had a giant inguinoscrotal hernia, for which he had not sought medical attention for the past 15 years. Imaging revealed that the hernia, predominantly on the right side, contained the bladder, causing obstruction, along with segments of the colon, small bowel, and ureters. Additionally, the examination showed cellulitis of the scrotal skin. The patient was admitted for urinary decompression and administration of antibiotics. He progressed to necrotizing infection of the scrotum necessitating emergent surgical intervention and several return operations before final closure of the skin. While giant inguinoscrotal hernias are a rare entity in developed countries, they present significant medical and surgical challenges, particularly in patients with multiple comorbidities. This case demonstrates a method of management of giant inguinoscrotal hernia and the challenges posed.</p>
Conclusion	Giant inguinoscrotal hernias are a rare entity in developed countries. The case highlights the significant medical and surgical challenges encountered in managing this condition, further complicated by a severe infection.
Key Words	giant inguinoscrotal hernia; necrotizing scrotal infection

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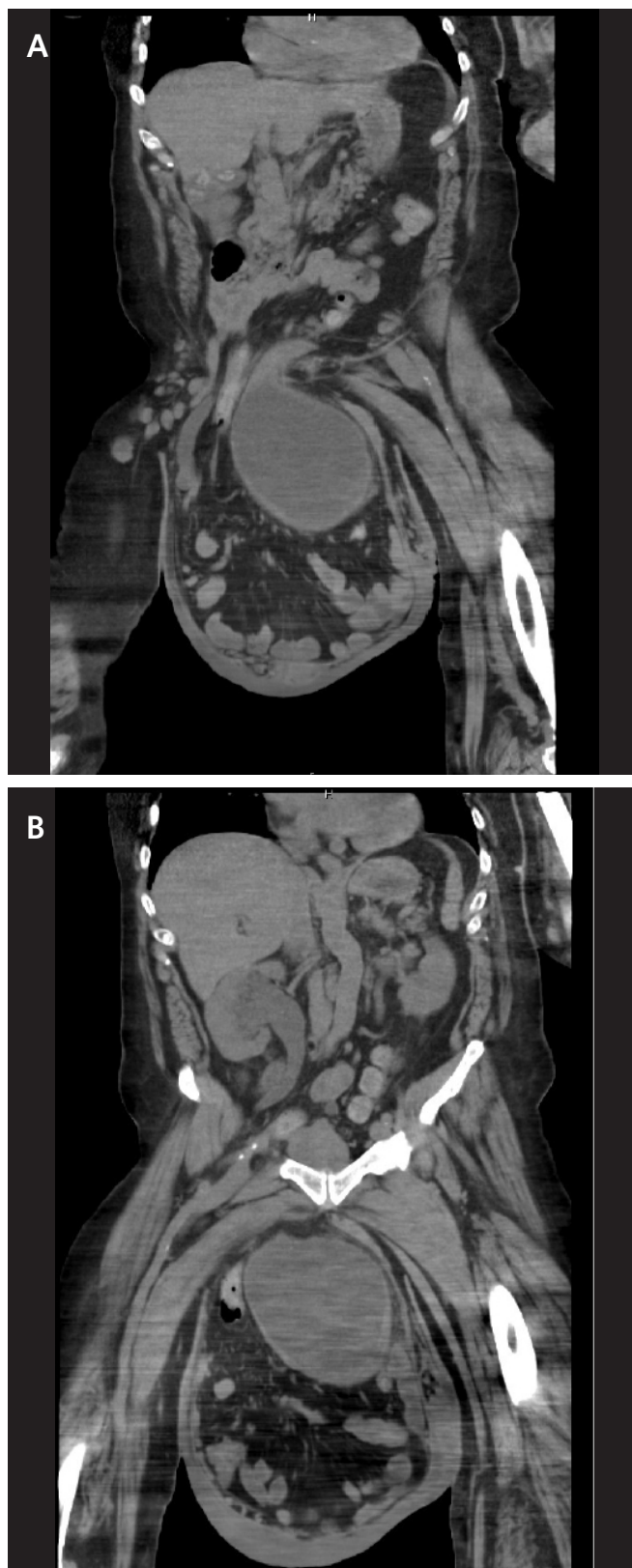
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Case Description

Giant inguinoscrotal hernias are defined as those that extend to the midpoint of the thigh in the standing position with an anteroposterior diameter of at least 30 cm and laterolateral diameter of 50 cm.¹ While rare in developed countries, cases have been reported typically as an inability to access care or unwillingness by the patient to seek medical care. As such, by the time of presentation there has often been a loss of domain within the abdominal cavity as well as significant impact on the patient's quality of life.^{2,3} Due to the size of the hernia, surgical repair poses a significant challenge with potential complications, including compromised respirations, abdominal compartment syndrome, need for extensive bowel resection or other intraabdominal organ removal. Here, we present just such a challenging case with discussion of possible avenues of repair of these hernias.

The patient, a 67-year-old man with past medical history of hypertension and open left inguinal hernia repair with mesh 17 years ago, presented as a transfer to the emergency department with complaint of inability to urinate. He reported experiencing scrotal swelling for approximately 15 years, which had recently worsened, rendering him unable to ambulate to the bathroom and urinate. He denied any other symptoms. On physical examination, he was noted to have a giant inguinoscrotal hernia, characterized by desquamation of the underlying skin with associated erythema and tenderness concerning for cellulitis. Despite being afebrile and normotensive, he exhibited atrial fibrillation with a rapid ventricular response. Labs were remarkable for a leukocytosis (WBC of 24.62) and elevated BUN/Cr levels (147/5.26). A CT abdomen and pelvis without contrast at the outside hospital showed a "massive right inguinal hernia containing most of the bladder with potential bladder outlet obstruction, portions of the colon and small bowel along with both ureters. Bilateral hydronephrosis with hydroureter" (Figure 1). Following admission, the patient was started on vancomycin for cellulitis. The plan was to repair the hernia using a Rives-Stoppa approach and permanent mesh placement once the infection resolved, with consultations from nephrology and urology. IV fluids were started for the AKI with no plans for immediate hemodialysis. On the second day of hospitalization, urology performed cystoscopy with Foley catheter placement. By the fourth hospital day, partial pressure necrosis was observed in the scrotum, progressing to full-thickness necrosis by the sixth day (Figure 2).

Figure 1. Coronal CT Scan Image Demonstrating Giant Inguinoscrotal Hernia. Published with Permission



Bladder, small intestine, large intestine, and both ureters are herniated and located within the scrotal sac.

Figure 2. Full-thickness Necrosis of Scrotum. Published with Permission



The patient was taken emergently to the OR for exploratory laparotomy, lysis of adhesions, open repair of right inguinal hernia with biologic mesh, debridement of the scrotum, right orchiectomy, and temporary abdominal closure. Considering the extensive adhesions and the large size of the hernia (14 cm), a transabdominal approach was chosen to facilitate content reduction and create abdominal space. Multiple thick adhesions were lysed, and the hernia defect was easily palpated but remained irreducible. An oblique incision was made between the ASIS and the pubic tubercle (Figure 3). The inguinal canal was opened, but the size of the hernia was so great that we could not encircle it and separate it from the surrounding structures, nor could the hernia be reduced at this point (Figure 4). The scrotum was then debrided, and the extended T-shaped oblique incision was employed to gain access and facilitate dissection of the hernia sac from surrounding structures (Figure 5). Contents were then reduced back into the abdominal cavity (Figure 6). Due to the significant size and potential risk of complications like ischemia and torsion, a right orchiectomy was performed. The large 14 × 7 cm hernia defect was repaired using Phasix mesh (BD, Warwick, RI), and the oblique skin incision was closed. The scrotum was loosely approximated and packed with Dakin's soaked kerlix. Complete abdominal closure was not possible due to stretched bowel mesentery, which raised concerns for potential volvulus. Resection of bowel was deemed unnecessary as there was no omentum to resect, and a temporary abdominal closure using an ABTHERA wound vac device (KCI, San Antonio, TX) was implemented (Figure 7). There were plans to return to the OR for washout and skin-only closure (Figure 8). The patient was admitted to the ICU for multi-organ failure management.

Figure 3. Initial Surgical Approach—Exploratory Laparotomy and Oblique Inguinal Incision. Published with Permission



Figure 4. Hernia Sac and Contents Through Oblique Incision. Published with Permission

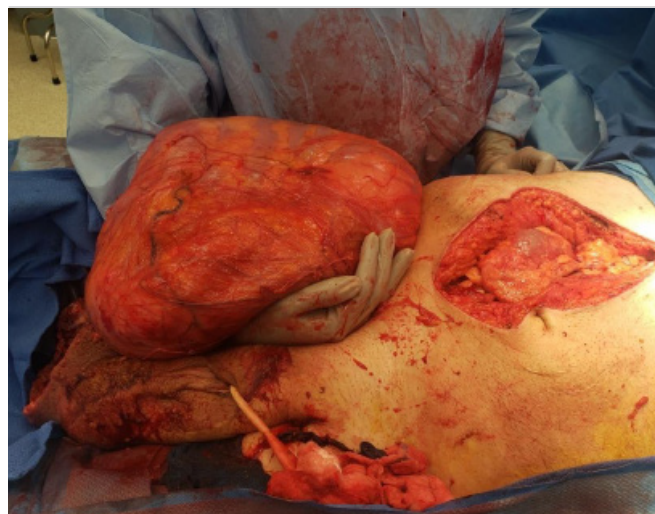


Figure 5. Oblique Scrotal Incision for Hernia Sac Separation and Orchiectomy. Published with Permission



Figure 6. Reduction of Hernia Contents into Abdominal Cavity. Published with Permission

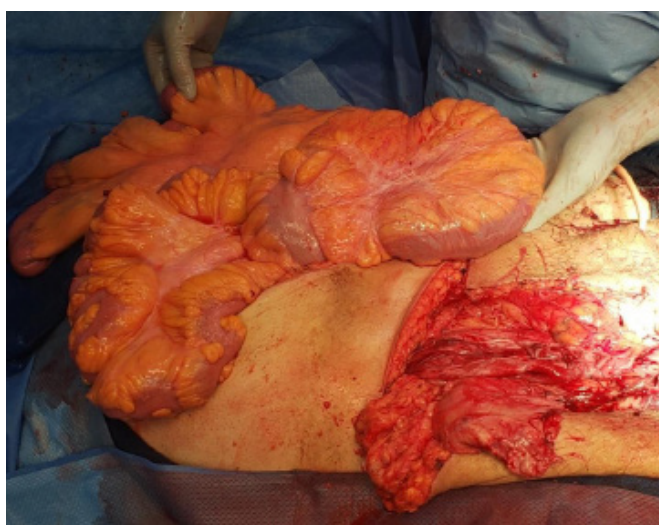


Figure 7. Elongated Mesentery of Small Bowel Reduced from Hernia Sac. Published with Permission



Figure 8. Skin-only and Scrotal Closures. Published with Permission



On hospital day 9 (HD 9), a second surgery was performed for abdominal washout and skin-only closure with Vicryl mesh underlay. This was achieved partially by utilizing excess scrotal skin. The postoperative course was complicated by supraventricular tachycardia (SVT), pulmonary embolism (PE) requiring heparin therapy, renal failure requiring dialysis, and a lower gastrointestinal bleed that did not necessitate surgical intervention. The patient was stabilized and discharged to a long-term acute care hospital on HD 44. Unfortunately, the patient was lost to follow-up.

Discussion

Giant inguinoscrotal hernias, while rare in economically developed countries, pose significant surgical challenges due to their complexity. As surgical techniques have advanced, diverse repair strategies have been explored in the literature:

- **Progressive pneumoperitoneum.** Initially described for elective repair in 1940,⁴ this method involves staged admissions for gradual introduction of increasing pneumoperitoneum.^{5,6} While successful for specific ventral hernias, its application in giant inguinoscrotal hernias has yielded mixed results. (**Contraindications**) Underlying cardiac/pulmonary issues and active infections like the one in our case.⁷ Cases have been described in which the pneumoperitoneum tracked into and expanded the hernia sac instead of expanding intra-abdominal volume.)⁸
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- **Abdominal wall separation.** This technique focuses on separating the abdominal wall muscles, allowing for better visualization and manipulation of the hernia contents during repair.
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- **Mesh repair and flap reconstruction.** Synthetic mesh materials are frequently used to reinforce the weakened abdominal wall and prevent future hernia recurrence. In some cases, local tissue flaps may also be mobilized and incorporated into the repair to provide additional support.
- **Intra-abdominal organ resection:** In extreme cases where the hernia sac contains strangulated or non-viable bowel tissue, surgical resection of the affected segment may be necessary before proceeding with hernia repair.

No single technique has proven consistently effective.⁹⁻¹¹ Furthermore, various cases have described repair through midline abdominal, oblique, or combination incisions, showing success dependent on the nature of the individual hernia. Orchiectomy is frequently necessary due to hernia contents adhering to the testis and the risk of ischemia during dissection.¹²

In this case, a combination of midline abdominal and oblique incisions was required due to the patient's active infection, emergent operation requirement, and dense adhesions. Furthermore, the patient's significant loss of domain necessitated skin-only abdominal closure, with a plan for delayed mesh repair of the abdominal wall, as the patient remained at high risk of intraabdominal complications.

Conclusion

Patients with giant inguinoscrotal hernias can present with complex medical and surgical issues. The surgical approach can be challenging, requiring multiple incisions, and patients may have a protracted hospital course. This case showcases the challenges surgeons face in dealing with this type of hernia.

Lessons Learned

Various factors continue to lead to cases of giant inguinoscrotal hernia in economically advanced nations, including difficulty accessing medical care or patient aversion to seeking care. Early management under controlled circumstances is preferable to emergent circumstances but may present significant management challenges.

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