Section: General Surgery

Case Report

GIANT RIGHT INGUINOSCROTAL HERNIA WITH LOSS OF DOMAIN SUCCESSFULLY MANAGED BY OPEN LICHTENSTEIN HERNIOPLASTY, SCROTOPLASTY AND ORCHIDECTOMY: A CASE REPORT

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ABSTRACT

Background: Giant inguinoscrotal hernias are rare in modern surgical practice and are frequently associated with loss of domain, in which a substantial proportion of the abdominal viscera permanently resides outside the abdominal cavity. Surgical repair is technically demanding because reintegration of the herniated viscera may precipitate respiratory compromise and abdominal compartment syndrome. Successful management requires meticulous preoperative optimization, careful operative planning, and vigilant postoperative monitoring. **Case Presentation:** A 71-year-old man presented with a progressively enlarging right inguinoscrotal swelling of ten years' duration associated with pain on prolonged standing, difficulty in walking, and progressive burial of the penis within the enlarged scrotum. Clinical examination revealed a giant partially reducible right inguinoscrotal hernia extending well into the scrotum with audible bowel sounds and an associated left direct inguinal hernia. Following one week of respiratory prehabilitation using incentive spirometry and bowel preparation, elective open surgery was performed under general anaesthesia. Dense adhesions between the hernia sac and small bowel loops were meticulously released, allowing complete reduction of the herniated bowel into the abdominal cavity. A tension-free Lichtenstein mesh hernioplasty using polypropylene mesh was performed, followed by scrotoplasty. Because the right testis was severely atrophic with compromised vascularity, right orchidectomy was undertaken. The postoperative period was complicated by transient respiratory distress secondary to restoration of the abdominal domain, which resolved with conservative management. The patient recovered uneventfully without evidence of abdominal compartment syndrome or recurrence during follow-up. **Conclusion:** Giant inguinoscrotal hernias with loss of domain remain one of the most challenging abdominal wall hernias encountered by general surgeons. Careful preoperative optimization, meticulous adhesiolysis, tension-free mesh repair, selective orchidectomy, and close postoperative monitoring are essential for achieving favourable outcomes while minimizing perioperative morbidity.

INTRODUCTION

Giant inguinoscrotal hernias represent one of the rarest and most technically demanding forms of abdominal wall hernias encountered in contemporary surgical practice. They are generally defined as inguinal hernias extending below the midpoint of the inner thigh when the patient is in the standing position. Because of delayed presentation and progressive enlargement over several years, a significant proportion of the abdominal viscera gradually migrates into the hernia sac, resulting in the phenomenon known as Loss of domain(LOD). In this condition, the abdominal cavity adapts to a reduced volume while the herniated viscera permanently occupy the hernia sac, making subsequent reduction difficult and potentially hazardous.

The principal challenge during surgical repair is the sudden restoration of the herniated abdominal contents into a contracted abdominal cavity. This may markedly elevate intra-abdominal pressure, resulting in diaphragmatic splinting, reduced

pulmonary compliance, impaired venous return, abdominal compartment syndrome (ACS), respiratory insufficiency, and haemodynamic instability. Consequently, meticulous perioperative planning is mandatory to minimize these life-threatening complications. Several adjunctive techniques, including progressive preoperative pneumoperitoneum, preoperative botulinum toxin A administration, visceral debulking procedures, and component separation techniques, have been described for selected patients with severe loss of domain.

Open tension-free mesh hernioplasty remains the preferred treatment for most giant inguinoscrotal hernias because it provides excellent exposure for adhesiolysis and safe reduction of herniated viscera. Additional procedures such as scrotoplasty may be required to remove redundant scrotal tissue and improve postoperative functional and cosmetic outcomes. Orchidectomy may become unavoidable when the spermatic cord is excessively elongated or when the testis is irreversibly atrophic because of chronic vascular compromise.

Because giant inguinoscrotal hernias have become increasingly uncommon owing to improved access to surgical care, published experience remains limited and is largely confined to isolated case reports. We report the successful management of a giant right inguinoscrotal hernia with loss of domain treated by open Lichtenstein mesh hernioplasty combined with scrotoplasty and orchidectomy, highlighting important perioperative considerations and postoperative management strategies.

CASE PRESENTATION

A 71-year-old gentleman presented to the Department of General Surgery with a progressively enlarging swelling involving the right groin and scrotum for approximately ten years. The swelling had initially been small but gradually increased in size over the years until it significantly interfered with his daily activities. He complained of discomfort while walking, pain after prolonged standing, difficulty in wearing clothes, and restriction of normal mobility. There was no history of acute abdominal pain, vomiting, constipation, abdominal distension, fever, or previous episodes suggestive of bowel obstruction or strangulation.

The patient was a known hypertensive receiving regular antihypertensive medication with satisfactory blood pressure control. He had no history of chronic obstructive pulmonary disease, diabetes mellitus, previous abdominal surgery, smoking, or connective tissue disorders. There was no family history of abdominal wall hernias.

General physical examination revealed a moderately built elderly male who was haemodynamically stable with normal oxygen saturation on room air. Abdominal examination demonstrated no evidence of bowel obstruction or peritonitis.

Local examination revealed a giant right inguinoscrotal swelling extending well into the scrotum. The swelling was partially reducible with a positive expansile cough impulse. Audible bowel sounds were present over the swelling, confirming bowel as the hernia content. The penis was almost completely buried within the enlarged scrotum, and the right testis could not be palpated separately. A small associated direct inguinal hernia was also identified on the right side. The overlying skin showed no evidence of ulceration, inflammation, or pressure necrosis.

Routine laboratory investigations, including complete blood count, renal function tests, liver function tests, coagulation profile, serum electrolytes, chest radiography, electrocardiography, and pulmonary function testing, were considered satisfactory for elective surgery. Considering the anticipated postoperative respiratory compromise associated with reduction of a giant loss-of-domain hernia, the patient underwent comprehensive preoperative optimisation. He was admitted one week before surgery and underwent supervised respiratory physiotherapy with intensive incentive spirometry to improve pulmonary reserve. A low-residue liquid diet was initiated two days before surgery, followed by bowel preparation using a glycerine enema on the day preceding surgery. After thorough counselling regarding the operative risks, including respiratory complications, abdominal compartment syndrome, recurrence, orchiectomy, and possible postoperative ventilatory support, informed written consent was obtained.

Operative Technique: Following completion of preoperative optimization, the patient underwent elective surgery under general anaesthesia with endotracheal intubation. Adequate intravenous antibiotic prophylaxis and deep venous thrombosis prophylaxis were administered before skin incision. A standard right inguinal incision was made, extending from the pubic tubercle towards the anterior superior iliac spine.

After division of the subcutaneous tissues and Scarpa's fascia, the external oblique aponeurosis was opened in the direction of its fibres. The spermatic cord was carefully mobilized and isolated. A giant indirect inguinal hernia sac with a broad neck was identified. The sac was densely adherent to the surrounding tissues and extended into the scrotum.

The hernia sac was carefully opened, revealing viable small bowel loops as the principal contents. Dense inter-bowel adhesions and adhesions between the bowel loops and the distal portion of the hernia sac were encountered, consistent with chronic incarceration. Meticulous adhesiolysis was performed using sharp and blunt dissection while preserving bowel integrity and mesenteric vascularity. Following complete release of the adhesions, the bowel loops were examined carefully and found to be viable, eliminating the need for bowel resection.

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The herniated viscera were gradually reduced into the abdominal cavity under controlled manual compression to minimise the sudden rise in intra-abdominal pressure. Reduction was achieved without undue tension or haemodynamic instability. The redundant hernia sac was ligated proximally using absorbable sutures and excised.

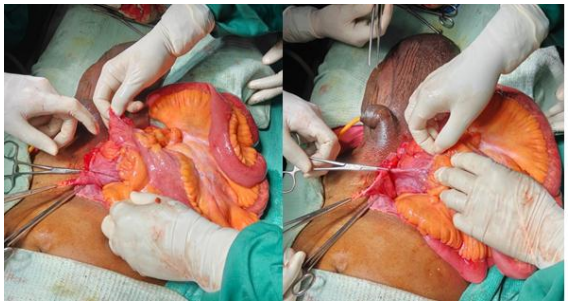

Figure 1: Intraopereative Finding Demonstrating Gaint Inguinooscrotal Hernia Containing Viable Small Bowel and Dense Adherent

Inspection of the posterior wall of the inguinal canal demonstrated significant attenuation consistent with a long-standing giant hernia. A standard tension-free Lichtenstein repair was performed using a 12 × 5 cm polypropylene mesh, which was tailored appropriately and secured using interrupted 2-0 light-weight polypropylene sutures to the pubic tubercle, inguinal ligament, and conjoint tendon. The mesh was slit laterally to accommodate the spermatic cord, ensuring adequate overlap without tension.

Figure 2: Clinical Appearance Before and At Post Op Follow Up Demonstrating Restoration Of Abdominal Contour

Following completion of the mesh repair, attention was directed towards the enlarged scrotum. Considerable redundancy of the scrotal skin remained following reduction of the hernia contents. Redundant scrotal tissue was excised, and reconstruction was performed using layered scrotoplasty to restore normal scrotal contour while ensuring satisfactory cosmetic and functional results. The right testis was found to be markedly atrophic with severe elongation of the spermatic cord and poor vascularity, indicating irreversible chronic ischaemic changes. Preservation of the testis was considered unlikely to provide functional benefit and carried a potential risk of postoperative ischaemic complications. Therefore, a right orchidectomy was performed after secure ligation of the spermatic cord structures.

Meticulous haemostasis was achieved throughout the procedure. The wound was irrigated with warm saline, and the external oblique aponeurosis, subcutaneous tissue, and skin were closed in layers. Sterile compression dressing and scrotal support were applied.

Postoperative Course: Immediately after surgery, the patient was transferred to the post-anaesthesia care unit for close cardiopulmonary observation. During the early postoperative period, he developed mild respiratory distress characterised by tachypnoea and reduced chest expansion without haemodynamic instability. This was attributed to elevation of the diaphragm secondary to restoration of abdominal domain after reduction of the chronically herniated abdominal viscera.

The patient was managed conservatively with supplemental oxygen, incentive spirometry, nebulisation, aggressive chest physiotherapy, adequate analgesia, early mobilisation, and continuous monitoring of respiratory function. Serial abdominal examinations demonstrated a soft abdomen without progressive distension, oliguria, or haemodynamic compromise. Clinical findings remained inconsistent with abdominal compartment syndrome, and invasive intra-vesical pressure monitoring was therefore not required.

Respiratory function gradually improved over the subsequent four to five days, and ventilatory support was not required at any stage. Bowel sounds returned on the second postoperative day, and oral feeding was resumed progressively without difficulty. Surgical wounds healed satisfactorily, with no evidence of surgical site infection, seroma, haematoma, mesh-related complications, or scrotal wound problems.

The patient was discharged in stable condition with advice regarding gradual mobilisation, avoidance of heavy lifting, use of scrotal support, respiratory exercises, and regular outpatient follow-up. At follow-up evaluation, he remained symptom-free with satisfactory wound healing, restoration of normal ambulation, acceptable cosmetic appearance of the scrotum, and no clinical evidence of hernia recurrence.

DISCUSSION

Giant inguinoscrotal hernias constitute one of the rarest presentations of abdominal wall hernias in

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modern surgical practice. Delayed presentation over many years allows progressive migration of abdominal viscera into the hernia sac, resulting in adaptation of the abdominal cavity to a reduced visceral volume—a phenomenon known as loss of domain (LOD). Reintegration of these viscera into the abdominal cavity during surgery represents the principal physiological challenge and accounts for the increased perioperative morbidity associated with these hernias.

The term "scrotal abdomen" is frequently used to describe advanced giant inguinoscrotal hernias in which the majority of abdominal contents permanently occupy the scrotum. Such patients often develop compromised respiratory mechanics, impaired mobility, urinary difficulties, skin ulceration, and a markedly reduced quality of life. Although elective repair is recommended whenever feasible, surgical intervention requires careful planning because sudden restoration of abdominal contents can significantly increase intra-abdominal pressure.

Several operative strategies have been described to facilitate safe reduction in patients with severe loss of domain. These include progressive preoperative pneumoperitoneum (PPP), preoperative administration of botulinum toxin A to increase abdominal wall compliance, component separation techniques, and, in selected patients, visceral debulking procedures. Progressive pneumoperitoneum gradually expands abdominal cavity volume over several days before surgery, reducing the risk of postoperative abdominal compartment syndrome. Similarly, botulinum toxin-induced temporary paralysis of the lateral abdominal wall muscles increases abdominal compliance and facilitates tension-free closure. However, these techniques are generally reserved for the most severe cases and require specialised expertise.

In the present patient, complete reduction of the herniated bowel was achieved without the need for adjunctive abdominal wall expansion procedures because meticulous adhesiolysis allowed gradual, controlled reduction with acceptable intraoperative physiological parameters. A standard Lichtenstein tension-free mesh repair was chosen because of its simplicity, reproducibility, excellent long-term outcomes, and ability to reinforce the attenuated posterior wall of the inguinal canal.

Scrotoplasty represents an important adjunctive procedure following repair of giant inguinoscrotal hernias. Failure to excise redundant scrotal tissue may result in persistent dead space, seroma formation, chronic infection, poor hygiene, and unsatisfactory cosmetic outcomes. Scrotoplasty in the present case restored near-normal scrotal anatomy while improving postoperative comfort and quality of life.

The decision to perform orchidectomy should be individualised. Preservation of the testis is desirable whenever vascularity is adequate. However, chronic compression, prolonged traction on the spermatic cord, and vascular compromise frequently result in irreversible testicular atrophy in elderly patients with giant hernias. In such circumstances, orchidectomy eliminates the risk of postoperative ischaemic necrosis and facilitates tension-free reconstruction. In our patient, the right testis demonstrated severe atrophy with compromised vascularity, making orchidectomy the most appropriate surgical option.

One of the most feared complications following repair of giant loss-of-domain hernias is abdominal compartment syndrome (ACS). Progressive elevation of intra-abdominal pressure may impair venous return, reduce renal perfusion, elevate diaphragms, decrease pulmonary compliance, and eventually lead to cardiovascular collapse. Early clinical indicators include increasing ventilatory requirements, oliguria, abdominal distension, rising airway pressures, and haemodynamic instability. Measurement of intra-vesical pressure remains the accepted indirect method for assessing intra-abdominal pressure in high-risk patients.

Our patient experienced transient postoperative respiratory compromise, most likely resulting from reduced diaphragmatic excursion following restoration of abdominal contents. Prompt conservative management with oxygen therapy, respiratory physiotherapy, adequate analgesia, and close monitoring resulted in complete recovery without invasive ventilation or decompressive intervention. The absence of progressive abdominal distension, oliguria, or haemodynamic deterioration effectively excluded clinically significant abdominal compartment syndrome.

Table 1: Published reports of giant inguinoscrotal hernia compared with the present case

Author	Year	Management	Outcome
Hodgkinson and McIlrath	1984	Hernioplasty with scrotal reconstruction	Good recovery
Trakarnsanga et al.	2007	Mesh hernioplasty	Successful repair
Staubitz et al.	2017	Open repair with adjunctive techniques	Uneventful recovery
Cavalli et al.	2017	Mesh repair with multidisciplinary care	Good functional outcome
Koller et al.	2024	Open repair for loss-of-domain hernia	Successful outcome
Present case	2026	Open Lichtenstein hernioplasty + scrotoplasty + orchidectomy	Complete recovery without recurrence during follow-up

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CONCLUSION

Giant inguinoscrotal hernias with loss of domain remain among the most technically demanding conditions encountered in abdominal wall surgery. Successful treatment requires meticulous preoperative assessment, optimisation of cardiopulmonary function, careful adhesiolysis, tension-free mesh repair, and appropriate adjunctive procedures tailored to intraoperative findings.

Scrotoplasty improves functional and cosmetic outcomes by removing redundant tissue, while orchidectomy should be reserved for cases with irreversible testicular atrophy or compromised vascularity. Postoperative monitoring for respiratory insufficiency and abdominal compartment syndrome is crucial because early recognition and prompt management can prevent life-threatening complications.

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