International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Bilateral Inguinal Hernia Presenting with Right-Sided Amyand's Hernia: A Rare Case Report, Surgical Management, and Comprehensive Review of Literature

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Abstract: ***Background**: Amyand's hernia is a rare condition defined by the presence of the vermiform appendix within an inguinal hernia sac. It accounts for approximately 1% of all inguinal hernias, with acute appendicitis occurring in only 0.07% to 0.13% of cases. Preoperative diagnosis is exceptionally challenging, and the condition is usually encountered incidentally during surgical exploration. **Case Presentation**: We present the case of a 49-year-old male with a known history of Type II Diabetes Mellitus who presented with a 1.5-year history of bilateral inguinal swelling and acute, severe right-sided abdominal pain for one day. Clinical examination revealed an incarcerated right inguinal hernia and a reducible left direct inguinal hernia. High-resolution ultrasonography diagnosed a right-sided complicated hernia containing an inflamed appendix. Intraoperatively, an acutely inflamed appendix was found within the right hernia sac, classifying it as a Losanoff and Basson Type 2 Amyand's hernia. He underwent an emergency open appendicectomy with primary tissue herniorrhaphy (Shouldice repair) on the right side to avoid mesh infection in a contaminated field, alongside a standard Lichtenstein tension-free mesh hernioplasty for the left side. **Conclusion**: Amyand's hernia warrants a high index of suspicion in patients presenting with a painful, incarcerated inguinal hernia. Management must be individualized based on the inflammatory status of the appendix. The avoidance of prosthetic mesh in the presence of acute appendicitis is critical to prevent devastating surgical site infections and mesh extrusion. This case underscores the importance of prompt surgical intervention and customized operative strategies.*

Keywords: Amyand's hernia, Appendicitis, Inguinal hernia, Losanoff and Basson classification, Lichtenstein repair, Case report

1. Introduction

Inguinal hernia repair is one of the most frequently performed surgical procedures globally. While the contents of an inguinal hernia sac are typically the omentum or small bowel loops, rare contents can include the urinary bladder, Meckel's diverticulum (Littre's hernia), or a portion of the circumference of the bowel wall (Richter's hernia). Amyand's hernia is a particularly rare clinical entity, defined by the presence of a vermiform appendix—whether normal, inflamed, or perforated—within an inguinal hernia sac [1]. The condition derives its name from Claudius Amyand, a French-born English surgeon who, in 1735, performed the first recorded successful appendicectomy on an 11-year-old boy who presented with a perforated appendix within a right inguinal hernia [2].

The overall incidence of having a normal appendix within an inguinal hernia sac is estimated to be around 1%, whereas the incidence of finding acute appendicitis within the sac is exceedingly rare, ranging from 0.07% to 0.13% of all inguinal hernia cases [3]. Amyand's hernia predominantly occurs on the right side due to the anatomical location of the appendix; however, left-sided cases have been reported in association with situs inversus, intestinal malrotation, or an exceptionally mobile cecum [4]. Preoperative diagnosis of Amyand's hernia is notoriously difficult and is frequently misdiagnosed as an incarcerated or strangulated inguinal hernia, epididymo-orchitis, or testicular torsion [5].

We present a unique case of a 49-year-old diabetic male who presented with bilateral inguinal hernias, complicated by acute appendicitis within the right-sided hernia sac. This report adheres to the CARE Guidelines for Case Reports [6] and aims to discuss the clinical presentation, diagnostic challenges, and tailored surgical management of Amyand's hernia based on established classification systems.

2. Case Presentation

Patient Information and Chief Complaints

A 49-year-old male of average build (Height: 170 cm, Weight: 80 kg, BMI: 27.7 kg/m²) presented to the surgical emergency department with a chief complaint of acute, severe abdominal pain localized to the right groin for the past 24 hours. The patient reported a 1.5-year history of bilateral, gradually enlarging inguinal swellings. Initially, the swellings were small, painless, and completely reducible upon lying supine. He experienced intermittent mild pain that exacerbated during physical exertion, prolonged standing, coughing, or straining. However, one day prior to admission, the pain over the right inguinal swelling sharply increased in intensity. This was accompanied by new-onset low-grade fever and nausea. He reported no history of vomiting,

constipation, loose stools, urinary disturbances, or local trauma. His past medical history was significant for Type II Diabetes Mellitus for the last three years, which was managed with regular oral hypoglycemic medications. He was accustomed to a mixed diet, with normal bowel and bladder habits, and unremarkable sleep patterns.

3. Clinical Examination

Upon initial evaluation, the patient was conscious, oriented, and hemodynamically stable. General physical examination revealed a pulse rate of 104 beats per minute, blood pressure of 130/80 mmHg, temperature of 99.7°F, and a respiratory rate of 22 breaths per minute. There was no evidence of pallor, icterus, cyanosis, clubbing, lymphadenopathy, or pedal edema. Systemic examination of the cardiovascular and respiratory systems was unremarkable, with normal S1 and S2, no murmurs, and bilaterally equal vesicular breath

sounds. Central nervous system evaluation showed no focal neurological deficits. Abdominal examination revealed a soft, scaphoid abdomen with active bowel sounds, and no generalized guarding or rigidity.

Local examination of the groin regions confirmed the presence of bilateral inguinal swellings. On the left side, there was a 6 × 4 cm swelling located above and medial to the pubic tubercle. The overlying skin was normal. The swelling was doughy in consistency, non-tender, and possessed an expansile cough impulse, but it was non-reducible. These findings were clinically suggestive of an incarcerated left direct inguinal hernia. On the right side, there was a smaller 2 × 1 cm swelling, also above and medial to the pubic tubercle. The skin was normal, and a cough impulse was present. However, the mass was distinctly tender, doughy, and non-reducible, leading to a preliminary clinical diagnosis of an incarcerated right inguinal hernia.

4. Laboratory Investigations

Preoperative laboratory investigations revealed an elevated total leukocyte count (WBC) of 11,900/mm³ with a predominant neutrophilia of 79.7% and lymphocytes at 11.9%, indicating an acute infectious or inflammatory process. Renal function was preserved with a serum urea of 23 mg/dL and creatinine of 0.8 mg/dL. Serum electrolytes were within normal limits (Sodium 137.6 mmol/L, Potassium 4.00 mmol/L, Chloride 100.6 mmol/L). His random blood glucose was elevated at 170 mg/dL, consistent with his known history of Type II Diabetes Mellitus. Viral serology (HIV, HCV, HBsAg) was non-reactive. An electrocardiogram (ECG) demonstrated sinus tachycardia.

5. Imaging Findings

High-resolution sonography of the bilateral inguinal and scrotal regions was performed to evaluate the non-reducible swellings. On the right side, a defect of size ~2.5 cm was noted in the anterior abdominal wall. The hernial sac contained edematous omental fat and the inflamed tip of the appendix. The sac showed a blind-ending tubular, non-compressible structure measuring ~1.0 cm in diameter with surrounding peri-appendiceal fat stranding. Color Doppler demonstrated increased vascularity within the wall, suggestive of reactive changes. On the left side, a defect of size ~3.9 cm was noted, with herniated bowel loops and omental fat displaying normal morphology, peristalsis, and vascularity. Bilateral testes and epididymides were normal in size and echotexture, with no hydrocele or solid focal lesions. These imaging findings unequivocally diagnosed a right complicated hernia containing an inflamed appendix (Amyand's hernia) alongside a left inguino-scrotal hernia.

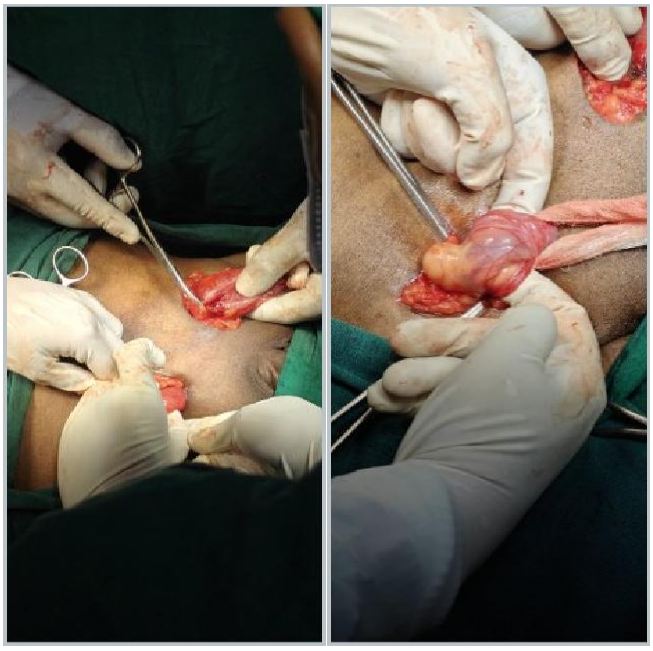
1) Operative Findings and Surgical Procedure

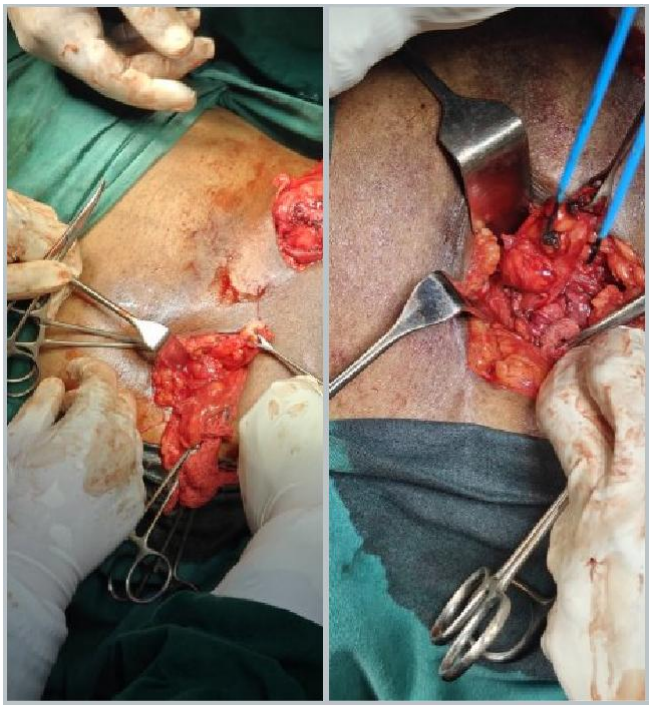
Given the diagnosis of acute appendicitis within an incarcerated hernia sac, the patient was taken up for emergency surgery under regional anesthesia. A standard right inguinal incision was made. Upon opening the inguinal canal and dissecting the hernia sac, an acutely inflamed and erythematous vermiform appendix was identified protruding through the defect, confirming the diagnosis of Amyand's hernia. There was localized inflammatory exudate but no gross purulent peritonitis or intra-abdominal sepsis. The appendix was carefully mobilized, and a standard appendicectomy was performed through the hernial orifice. The appendiceal stump was secured and inverted. Due to the contamination of the surgical field by the inflamed appendix (clean-

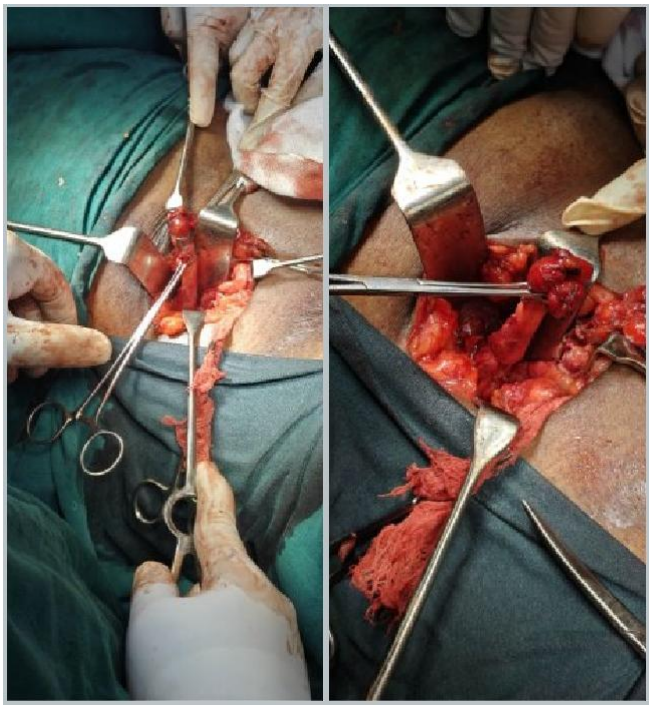
contaminated surgical wound), prosthetic mesh placement was strictly contraindicated. Therefore, a primary tissue herniorrhaphy (modified Shouldice repair) was meticulously performed using non-absorbable sutures to close the right inguinal defect.

Following the completion of the right-sided procedure, a separate left inguinal incision was made. The left-sided hernia sac, which contained viable omentum and bowel loops, was reduced. Since there was no contamination on the left side, a standard Lichtenstein tension-free mesh hernioplasty was performed to reinforce the posterior wall of the inguinal canal.

2) Intraoperative Photographic Records







3) Histopathology and Post-operative Course

The resected appendix was sent for routine histopathological examination. Macroscopic evaluation showed an edematous and congested appendiceal wall. Microscopic analysis demonstrated mucosal ulceration with dense transmural infiltration of polymorphonuclear leukocytes, confirming acute suppurative appendicitis without evidence of malignancy or specific granulomatous disease.

The patient's post-operative recovery was uneventful. He was initiated on broad-spectrum intravenous antibiotics (ceftriaxone and metronidazole) and adequate analgesia. His glycemic levels were optimized using a sliding scale insulin regimen. He was mobilized on the first post-operative day, tolerated an oral diet well, and was discharged on the fourth post-operative day in a hemodynamically stable condition. Follow-up visits at two weeks and three months showed well-healed surgical scars with no evidence of wound infection, mesh rejection on the left side, or hernia recurrence bilaterally.

6. Discussion

Amyand's hernia, characterized by the presence of a vermiform appendix in an inguinal hernia sac, is a rare surgical phenomenon. Historically, Claudius Amyand first documented and successfully operated on this condition in 1735 at St. George's Hospital, London. The occurrence of a normal appendix in an inguinal hernia sac is reported in roughly 1% of cases, while the presence of acute appendicitis is extremely rare (0.07%–0.13%) [7]. The underlying pathophysiology leading to appendicitis within a hernia sac is debated. Some authors suggest that the appendix is inherently prone to inflammation due to extraluminal compression at the neck of the hernia sac, which impairs venous drainage, precipitates edema, and subsequently compromises arterial supply, culminating in ischemic necrosis and bacterial translocation [8]. Alternatively, acute appendicitis may occur primarily due to classical luminal obstruction (e.g., by a fecalith), followed by rapid progression to gangrene due to the tight confines of the hernia sac.

The clinical presentation is largely indistinguishable from an incarcerated or strangulated inguinal hernia. Patients typically present with a tender, irreducible groin mass, localized pain, and absent cough impulse. Systemic signs of infection, such as fever and leukocytosis, may or may not be present early in the course. Consequently, preoperative diagnosis relies heavily on high-resolution imaging. Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis is the gold standard, demonstrating a tubular, blind-ending structure arising from the cecum and extending into the inguinal canal [9]. In our case, high-resolution ultrasonography successfully identified the inflamed appendix and peri-appendiceal stranding, proving to be a highly effective and readily available diagnostic modality.

7. Classification and Management

The surgical management of Amyand's hernia is predominantly guided by the Losanoff and Basson classification system, which delineates four types based on the inflammatory status of the appendix and recommends specific therapeutic approaches [10]:

- Type 1: Normal appendix within an inguinal hernia. Management involves hernia reduction with mesh repair. Appendicectomy is generally not recommended due to the risk of converting a clean procedure into a clean-contaminated one.
- Type 2: Acute appendicitis within an inguinal hernia, without abdominal sepsis. Management entails appendicectomy through the hernia sac followed by primary tissue repair (without mesh).
- Type 3: Acute appendicitis within an inguinal hernia, complicated by abdominal wall or peritoneal sepsis. Management dictates laparotomy for appendicectomy and peritoneal lavage, followed by primary tissue hernia

repair.
- Type 4: Acute appendicitis within an inguinal hernia, complicated by other unrelated abdominal pathology. Management is tailored to the specific pathology in addition to laparotomy and primary hernia repair.

Our patient strictly fell into Losanoff and Basson Type 2. In alignment with established guidelines, an appendicectomy was performed through the groin incision. The use of a synthetic mesh in a Type 2 Amyand's hernia remains a topic of significant surgical controversy. While some contemporary authors argue that biological meshes or even synthetic meshes under heavy antibiotic cover can be safely used, traditional surgical doctrine strictly prohibits the use of prosthetic materials in a contaminated field (due to acute appendicitis) to prevent deep-seated mesh infections, chronic fistulas, and prolonged morbidity [11, 12]. Hence, we opted for a traditional primary tissue repair on the right side. To our advantage, the left side lacked contamination, allowing for a standard tension-free Lichtenstein repair.

Novelty and Clinical Learning Points

This case is particularly unique due to the simultaneous presentation of a bilateral hernia with a unilateral Amyand's hernia. The contrasting intraoperative management—tissue repair on one side and mesh repair on the other—highlights the vital necessity for surgeons to remain adaptable and base real-time decisions on intraoperative pathology rather than defaulting to a uniform approach. The prompt utilization of ultrasonography averted potential visceral compromise and allowed for meticulous preoperative planning.

8. Conclusion

Amyand's hernia is a rare and challenging surgical entity that masquerades as an incarcerated inguinal hernia. Preoperative imaging like ultrasound or CT is invaluable for early diagnosis. The surgical management must be strictly customized according to the Losanoff and Basson classification. As demonstrated in this case, a Type 2 Amyand's hernia necessitates appendicectomy followed by primary tissue repair, avoiding the catastrophic complications associated with prosthetic mesh infection. A high index of suspicion and astute clinical judgment are paramount for ensuring favorable patient outcomes.

Declarations

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

Ethical Approval: The case report was approved by the Institutional Ethics Committee of Sri Lakshmi Narayana Institute of Medical Sciences (SLIMS), Puducherry.

Conflict of Interest: The authors declare that they have no competing interests.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Tables

Table 1: Patient Demographics and Clinical Presentation

Parameter	Patient Details
Age / Sex	49 years / Male
Comorbidities	Type II Diabetes Mellitus (x 3 years)
Chief Complaints	Right inguinal pain (1 day), bilateral swelling (1.5 years)
Vital Signs	Pulse: 104/min, BP: 130/80 mmHg, Temp: 99.7°F
Local Exam (Right)	2x1 cm, tender, non-reducible, doughy, cough impulse present
Local Exam (Left)	6x4 cm, non-tender, non-reducible, expansile cough impulse

Table 2: Laboratory and Imaging Findings

Investigation	Result	Interpretation
Total WBC Count	11,900 cells/cu.mm	Leukocytosis (Infection/Inflammation)
Neutrophils	79.7 %	Neutrophilia
Random Blood Sugar	170 mg/dL	Elevated (Known Diabetic)
Serum Creatinine	0.8 mg/dL	Normal renal function
Viral Markers (HIV, HCV, HBsAg)	Non-Reactive	Negative for common viral blood-borne pathogens
USG Right Groin	2.5 cm defect, inflamed tubular structure (appendix)	Right Amyand's Hernia (Incarcerated)
USG Left Groin	3.9 cm defect, viable bowel and omentum	Left Inguino-scrotal Hernia

Table 3: Losanoff and Basson Classification of Amyand's Hernia

Classification Type	Description	Surgical Management
Type 1	Normal appendix within an inguinal hernia	Hernia reduction, mesh repair (appendicectomy not recommended)
Type 2	Acute appendicitis within an inguinal hernia, no abdominal sepsis	Appendicectomy through hernia, primary tissue repair (no mesh)
Type 3	Acute appendicitis within an inguinal hernia, abdominal wall or peritoneal sepsis	Laparotomy, appendicectomy, peritoneal lavage, primary tissue repair
Type 4	Acute appendicitis within an inguinal hernia, related or unrelated abdominal pathology	Manage specific pathology as appropriate, primary hernia repair

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