

Case Report

Large incarcerated inguinoscrotal type I Amyand's hernia managed with appendix preserving Lichtenstein mesh repair: a case report

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ABSTRACT

Amyand's hernia is the presence of the vermiform appendix within an inguinal hernia sac and represents an uncommon intraoperative finding whose management depends on appendiceal viability and operative-field contamination. We report a 70-year-old man with a six-week history of a right inguinal hernia who developed one week of progressive inguinoscrotal enlargement, pain rated 8/10, and absence of bowel movements despite preserved flatus. Examination showed a large, firm, nonreducible right inguinoscrotal hernia without skin inflammatory changes or clinical peritonitis. Plain pelvic radiographs demonstrated marked right hemiscrotal enlargement with bowel-containing herniation. Because urgent surgery was indicated, no ultrasonography or computed tomography was obtained. Open exploration revealed a large indirect inguinoscrotal sac measuring approximately 15 × 10 cm. Controlled opening demonstrated the cecum and a macroscopically normal appendix without inflammation, ischemia, perforation, or contamination, establishing a Losanoff-Basson Type I Amyand's hernia. The appendix was preserved and reduced, the redundant sac was resected, and a tension-free Lichtenstein repair with polypropylene mesh was completed. Recovery was uncomplicated. At two-week follow-up, there was no edema, clinical recurrence, testicular abnormality, or other identified complication. This case illustrates that urgent symptoms and large scrotal extension do not necessarily imply appendiceal inflammation and supports a contamination-directed strategy in which a normal appendix may be preserved while definitive prosthetic hernia repair is performed.

Keywords: Amyand's hernia, Hernia, Inguinal, Appendix, Herniorrhaphy, Surgical mesh

INTRODUCTION

An inguinal hernia occasionally contains the vermiform appendix, creating a combined problem of groin

reconstruction and appendiceal management rather than a routine hernia repair. This configuration is termed Amyand's hernia. Its eponym recalls Claudius Amyand, who in 1735 removed a perforated appendix from an

inguinal hernia in a child. Contemporary reviews estimate that an appendix is encountered in approximately 0.19%-1.7% of inguinal hernias, whereas acute appendicitis within the sac is considerably less frequent.^{1,2}

The clinical presentation rarely identifies the diagnosis before surgery. Pain, irreducibility, scrotal enlargement, and obstructive symptoms usually resemble other complicated groin hernias. In a systematic review of 161 patients, 92.5% of Amyand hernias were right-sided, 77.3% were incarcerated, and a preoperative diagnosis was achieved in only 23.1%. A later 20-year systematic review including 442 patients also demonstrated marked male predominance and showed that acute hernia-related complications were a common reason for urgent intervention.^{3,4}

Once the appendix is recognized, operative planning depends chiefly on its macroscopic condition, the presence or absence of contamination, and the requirements of the hernia repair. The Losanoff-Basson system organizes Amyand hernias into four categories according to appendiceal inflammation and associated sepsis. Type I, in which the appendix is normal, remains particularly relevant because both prophylactic appendectomy and prosthetic reinforcement have been managed variably in published series and reviews.^{5,6}

We present a 70-year-old man with a large, painful, nonreducible right inguinoscrotal hernia that required urgent open exploration after assessment with plain radiography alone. A normal appendix and cecal component were found within the sac. The appendix was preserved, and definitive tension-free Lichtenstein repair with polypropylene mesh was completed in a clean field. The report focuses on the rationale for separating the severity of the hernia presentation from the condition of the appendix when choosing the operative strategy.

CASE REPORT

A 70-year-old man presented to the emergency department on August 5, 2026. He had first noticed a right inguinal hernia approximately six weeks earlier and initially had no pain. During the week before presentation, the inguinoscrotal volume progressively increased and pain reached 8/10 on a visual analog scale. He also reported no bowel movement for one week but continued to pass flatus and denied nausea or vomiting. His relevant medical history included mitral insufficiency diagnosed at 27 years of age, for which he reported no medical or surgical treatment, and a previous tonsillectomy. He denied regular medications, known allergies, tobacco use, alcohol use, transfusions, and other major surgical history.

On surgical assessment, he was conscious and hemodynamically stable: blood pressure was 129/78 mmHg, heart rate 88 beats/min, respiratory rate 18 breaths/min, temperature 36.9 °C, and oxygen saturation 98% on room air. The abdomen was globose because of

the adipose pannus, soft and depressible, with mild superficial and deep tenderness in the right lower quadrant and no clinical findings of an acute abdomen. A large, firm, nonreducible right inguinoscrotal hernia was present, with clinically suspected bowel content. The overlying skin showed no discoloration or other macroscopic inflammatory change.

Preoperative laboratory testing did not demonstrate marked leukocytosis; the documented leukocyte value was 9.25 with neutrophils of 87.8%. Hemoglobin was 15, platelets 337, creatinine 0.99, and the international normalized ratio was 1.05. Plain anteroposterior and lateral pelvic radiographs were obtained. No formal radiologist interpretation was available; the treating team documented abundant coprostasis and apparent bowel loops extending into the right hemiscrotum. The images demonstrated pronounced enlargement of the right hemiscrotal silhouette with bowel-containing extension below the inguinal region (Figure 1). Because the hernia was painful and nonreducible and urgent operative treatment was indicated, no preoperative ultrasonography or computed tomography was performed.

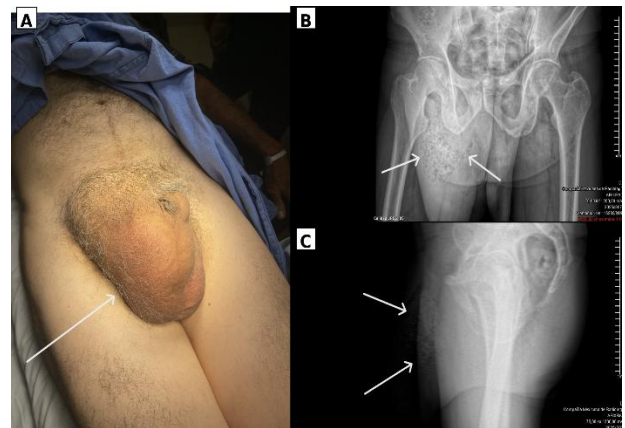


Figure 1: Preoperative evaluation. (A) Marked right inguinoscrotal enlargement caused by the nonreducible hernia. (B) Anteroposterior pelvic radiograph demonstrating pronounced enlargement of the right hemiscrotal silhouette with bowel-containing extension below the inguinal region and a stool/gas pattern. (C) Lateral radiograph demonstrating the caudal inguinoscrotal extension. No formal radiologist interpretation was available.

Emergency open right inguinal exploration was performed under balanced general anesthesia. Before incision, the inguinoscrotal enlargement measured approximately 15 cm along its major axis, without skin discoloration, local hyperthermia, or macroscopic evidence of ischemia. An oblique right inguinal incision was made parallel to the inguinal ligament. After division of the superficial layers, the external oblique aponeurosis was opened in the direction of its fibers. The ilioinguinal and iliohypogastric nerves were identified, atraumatically separated from the intended prosthetic fixation field, and preserved. A

bifurcated ilioinguinal nerve configuration was clearly exposed during the dissection (Figure 3A).

The spermatic cord was markedly displaced and distorted by the large hernia sac. It was carefully mobilized and looped, with preservation of the vas deferens and spermatic vessels. An indirect hernia sac was identified emerging through the deep inguinal ring and extending into the scrotum.

Constricting fibers at the deep ring were released only as required to permit atraumatic reduction. Progressive scrotal compression combined with controlled proximal traction allowed reduction of the herniated contents from the right hemiscrotum. At that point, the large sac remained closely adherent to and in intimate relationship with the spermatic cord structures (Figure 2A). The sac was then dissected circumferentially from the cord using blunt dissection and low-energy electrocautery, selectively

separating cremasteric fibers. A thin-walled indirect sac measuring approximately 15 × 10 cm was fully individualized to its neck at the deep inguinal ring (Figure 2B).

The proximal sac was opened in a controlled fashion to inspect its contents. The cecum and vermiform appendix were identified. The appendix had normal macroscopic caliber and coloration, an intact serosal surface, and no hyperemia, edema, fibrin, perforation, necrosis, purulent secretion, or other evidence of acute appendicitis; the cecum was likewise free of visible inflammation and the operative field was not contaminated (Figure 2C). These findings established a Losanoff-Basson Type I Amyand's hernia. Because the appendix was normal, appendectomy was not performed. The appendix and cecal component were gently reduced into the abdominal cavity without torsion, traction injury, or apparent mesenteric compromise.

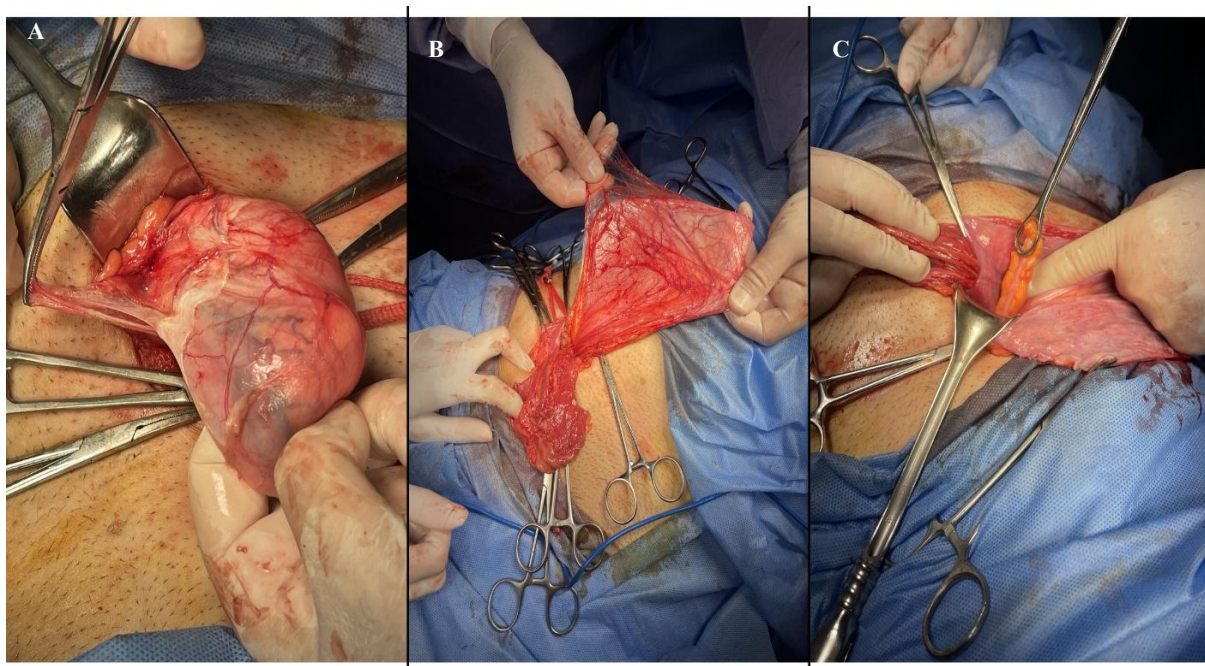


Figure 2: Operative progression and diagnosis. (A) Large indirect inguinoscrotal hernia sac after reduction of the scrotal component, still adherent and closely related to the spermatic cord structures before circumferential dissection. (B) Fully individualized hernia sac after circumferential separation from adjacent cord structures. (C) Controlled opening of the proximal sac demonstrating a macroscopically normal vermiform appendix within the hernia contents, without visible hyperemia, edema, fibrin, perforation, necrosis, or purulence, consistent with Losanoff-Basson Type I Amyand's hernia.

The redundant distal hernia sac was resected after its neck had been controlled, and the proximal peritoneal remnant was closed with long-lasting absorbable 2-0 suture. After confirming hemostasis and preservation of the cord and neural structures, a tension-free Lichtenstein repair was performed with a flat polypropylene mesh. The prosthesis was positioned with medial overlap at the pubic region, fixed inferiorly to the inguinal ligament and superiorly to the internal oblique/conjoint region, and slit laterally to create two tails around the spermatic cord.

Fixation was performed under direct vision while avoiding the identified ilioinguinal and iliohypogastric nerves. The mesh remained flat without constriction of the cord (Figure 3B). No active bleeding, visceral injury, contamination, or apparent spermatic-cord compromise was observed. The external oblique aponeurosis and wound were closed in layers, and the patient was transferred to post-anesthesia recovery in stable condition without apparent intraoperative complications.

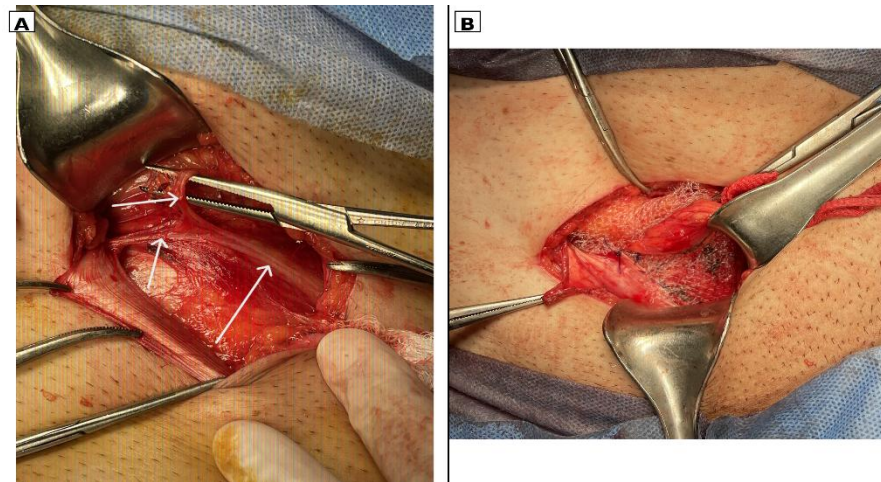


Figure 3: Anatomical preservation and reconstruction. (A) Intraoperative exposure of a bifurcated ilioinguinal nerve branch, identified and preserved during open inguinal dissection. (B) Polypropylene mesh positioned and fixed during tension-free Lichtenstein repair after reduction of the noninflamed appendix and cecal component.

The early postoperative course on the surgical ward was uncomplicated. He remained hemodynamically stable and afebrile, began a liquid diet with progression according to tolerance, and underwent early assisted ambulation. He was subsequently discharged after satisfactory recovery.

At outpatient review two weeks after surgery, there was no edema, no clinical evidence of hernia recurrence, and no testicular abnormality or other postoperative complication. The short-term surgical evolution was considered satisfactory. A concise clinical timeline is provided in Table 1.

Table 1: Clinical timeline.

Time	Clinical event	Key findings/management
~6 weeks before presentation	Onset	Patient first noticed a right inguinal hernia; initially painless.
~1 week before presentation	Clinical progression	Progressive inguinoscrotal enlargement and pain to 8/10; no bowel movement for one week, but continued passage of flatus; no nausea or vomiting.
Day 0 (August 5, 2026)	Emergency surgical assessment	Large, firm, nonreducible right inguinoscrotal hernia without cutaneous inflammatory changes or clinical peritonitis. Plain AP and lateral pelvic radiographs showed bowel-containing inguinoscrotal extension; no ultrasound or CT was obtained.
Day 0	Emergency operation	Open inguinal exploration; large indirect sac (~15 × 10 cm) reduced and dissected. Cecum and macroscopically normal appendix identified in the sac; Losanoff-Basson Type I Amyand's hernia. Appendix preserved and reduced; redundant sac resected; Lichtenstein polypropylene mesh repair completed.
Early postoperative period	Hospital recovery	Hemodynamically stable and afebrile; diet advanced according to tolerance; early assisted ambulation; subsequently discharged after satisfactory recovery.
2 weeks after surgery	Outpatient follow-up	No edema, no clinical recurrence, clinically normal testis, and no other postoperative complication identified.

DISCUSSION

The central finding in this case was the discordance between a clinically severe hernia presentation and a completely viable appendix. The patient had marked scrotal enlargement, irreducibility, and substantial pain, yet exploration showed neither appendicitis nor contamination. This pattern is well represented in the

literature: normal appendices constitute a substantial proportion of reported Amyand hernias, while emergency presentation frequently reflects incarceration of the hernia itself rather than primary appendiceal disease.^{3,4} Why the appendix enters the inguinal canal is not fully established. Proposed contributors include increased mobility of the cecum and appendix and an anatomic pathway that permits their descent into the sac. Once trapped at the hernia neck,

repeated mechanical stress, extraluminal compression, impaired venous drainage, edema, and eventually arterial compromise have all been proposed as mechanisms capable of producing secondary appendiceal inflammation. These mechanisms also explain why local symptoms may be pronounced before inflammatory changes of the appendix develop. In the present patient, the appendix remained thin-walled, normally colored, and free of fibrin, necrosis, or purulence, supporting incarceration of the hernia complex rather than appendicitis as the source of symptoms.^{2,6}

Cross-sectional or targeted groin imaging can occasionally identify the appendix preoperatively, but the diagnosis remains predominantly operative. Ultrasonography may demonstrate a blind-ending tubular structure associated with the cecal region, whereas computed tomography can establish continuity between the cecum and the structure entering the inguinal canal. Even in the systematic review by Papaconstantinou et al however, fewer than one quarter of patients were diagnosed before surgery, and computed tomography accounted for most of those preoperative diagnoses.³

Only plain radiographs were obtained in this patient because a painful, nonreducible inguinoscrotal hernia had

already established the indication for urgent exploration. The films supported bowel-containing extension into the scrotal projection but could not define the appendix. A 2024 report in this journal described a different Type I scenario in which ultrasonography demonstrated the appendix before operation and Lichtenstein repair was subsequently performed without appendectomy. Taken together, the two presentations illustrate that imaging may refine the diagnosis when time and clinical circumstances permit, but identification of Amyand's hernia is not a prerequisite for timely treatment of an incarcerated groin hernia.⁷

The Losanoff-Basson classification remains useful because it links operative anatomy to escalating infectious risk (Table 2). Type I denotes a normal appendix within the hernia sac. Type II describes acute appendicitis confined to the sac without abdominal sepsis. Type III includes appendicitis accompanied by abdominal wall or peritoneal sepsis, and Type IV refers to an Amyand hernia associated with an additional abdominal disease. The original framework therefore moves from reduction and prosthetic hernia repair in a clean Type I field toward appendectomy, source control, and avoidance of routine prosthetic material as contamination increases.⁵

Table 2: Losanoff-Basson classification of Amyand's hernia and classical management framework.

Type	Definition	Classical management framework
I	Normal appendix within an inguinal hernia sac.	Reduce appendix and perform mesh hernia repair; prophylactic appendectomy may be individualized, historically considered more often in younger patients.
II	Acute appendicitis within the hernia sac without abdominal sepsis.	Appendectomy through the hernia; primary tissue repair in the classical scheme; avoid routine prosthetic mesh in an infected field.
III	Acute appendicitis with abdominal wall or peritoneal sepsis.	Appendectomy with adequate source control, often requiring laparotomy; primary tissue repair or delayed reconstruction in the classical scheme; avoid prosthetic mesh in gross contamination.
IV	Amyand's hernia associated with additional related or unrelated abdominal pathology.	Manage the appendix and hernia according to Types I-III and investigate/treat the additional abdominal pathology as indicated.

Note: This table summarizes the original Losanoff-Basson concept. Contemporary management is individualized according to appendiceal viability, contamination, patient factors, and reconstructive requirements; modern observational evidence does not support treating the table as an absolute rule.^{5,6,10}

The classification should nevertheless be interpreted as a decision framework rather than an inflexible operative prescription. Contemporary evidence consists mainly of case reports, small series, and retrospective syntheses, with substantial variation in both appendectomy and mesh use.

In practice, the variables with the greatest immediate relevance are appendiceal viability, gross contamination, bowel involvement, the quality of the local tissues, patient characteristics, and the feasibility of obtaining a durable repair.⁶

For Type I disease, the unresolved question is whether a normal appendix should be removed. Preservation avoids

converting a clean hernia operation into a procedure involving entry into the gastrointestinal tract and avoids additional dissection when the appendix is healthy. Conversely, some surgeons favor appendectomy in selected patients to eliminate future appendicitis or when adhesions make reduction difficult.

Sharma et al reported 18 Amyand hernias and treated all 11 patients with a normal appendix by mesh repair without appendectomy. By contrast, Kose et al reported five patients with noninflamed appendices who underwent appendectomy together with mesh repair and had no infectious complication or recurrence during their reported follow-up.^{8,9}

These apparently different strategies are not necessarily contradictory; they reflect the limited evidence base and the importance of selection. In the 20-year review by Manatakis et al simple reduction was used more often than appendectomy in elective cases, and most adults treated electively received mesh. The systematic review by Bratu et al likewise found no uniform approach to a normal appendix. For the present 70-year-old patient, the appendix was freely reducible after sac exposure, showed no inflammation, and did not require resection to complete the hernia repair. Preserving it therefore avoided an additional procedure without compromising definitive reconstruction.^{4,6}

The decision to implant mesh should be considered separately from the decision to perform appendectomy. The strongest rationale for prosthetic repair exists when the field is clean and the appendix is viable. A 2025 systematic review comparing mesh and suture approaches found that mesh was used predominantly in patients without appendiceal inflammation, whereas septic presentations were preferentially managed with tissue repair. Although postoperative infection was uncommon in the reported series, the authors emphasized the selection bias inherent in the available literature and the absence of high-level comparative evidence.¹⁰

Broader emergency-hernia guidance supports the same contamination-based reasoning. The World Society of Emergency Surgery recommends synthetic mesh for emergency hernia repair in a clean field when there is no intestinal strangulation requiring resection or gross contamination. International HerniaSurge guidance likewise supports mesh-based repair for most adult inguinal hernias and emphasizes technique, appropriate fixation, and prevention of chronic pain. In this operation, there was no enteric resection, perforation, purulence, or ischemic bowel; therefore, a standard tension-free polypropylene Lichtenstein repair was compatible with both the local findings and general groin-hernia principles.²

The inguinoscrotal size of the hernia added a separate layer of technical difficulty. Current scrotal-hernia guidance defines these hernias by descent into the scrotum with distortion of scrotal anatomy and recognizes higher operative complexity and morbidity than in routine groin repair. Open anterior mesh repair remains a common approach. In this patient, reduction required progressive scrotal compression, limited enlargement of the deep ring, and circumferential dissection of a 15 x 10 cm sac from a displaced spermatic cord. Preservation of the vas deferens, spermatic vessels, and a clinically normal testis at follow-up therefore represented important technical endpoints in addition to hernia closure.¹⁴

The contrast between uncomplicated and septic Amyand hernia is clinically important. A published Type III Amyand hernia with perforated appendicitis was associated with communicating retroperitoneal and scrotal

abscesses and testicular ischemia; management required appendectomy, drainage of the infected compartments, orchiectomy for nonviable testicular tissue, and a nonprosthetic Shouldice repair. This report illustrates the opposite end of the contamination spectrum from the present Type I case and reinforces why the operative field, rather than the eponym alone, should determine whether prosthetic reconstruction is appropriate.¹⁵

Careful anatomic dissection was also relevant because the large sac had distorted the cord and inguinal canal. The ilioinguinal and iliohypogastric nerves were identified and kept away from mesh-fixation sutures, consistent with guideline emphasis on nerve recognition and avoidance of iatrogenic entrapment during open repair. The principal strengths of this report are direct photographic documentation of the scrotal presentation, sac dissection, normal appendix, and final reconstruction, together with a detailed operative account confirming a clean field. Its limitations are the absence of preoperative ultrasonography or computed tomography, the lack of a formal radiologist report for the plain films, and follow-up limited to two weeks. Accordingly, the case documents a satisfactory early result but cannot establish long-term recurrence, chronic postoperative inguinal pain, or late mesh-related outcomes.^{12,13}

CONCLUSION

A large, painful, irreducible inguinoscrotal hernia can contain a macroscopically normal appendix despite a clinical presentation that suggests complicated incarceration. In Losanoff-Basson Type I Amyand's hernia, the operative decision should be driven by appendiceal viability, adhesions, contamination, patient factors, and the planned hernia reconstruction rather than by the eponym alone. In this older adult with a freely reducible, noninflamed appendix and a clean field, appendix preservation avoided an unnecessary enteric procedure and permitted definitive tension-free Lichtenstein polypropylene mesh repair. The satisfactory early outcome supports the internal consistency of this contamination-directed strategy, while longer follow-up and higher-quality comparative evidence remain necessary to define optimal management across Amyand subtypes.

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