



Case report

Amyand's hernia combined with contralateral recurrent inguinal hernia: A case report

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ABSTRACT

Introduction: Amyand's hernia (AH)—where the appendix becomes incarcerated within the inguinal hernia (IH) sac—is rare, particularly if detected and operated concurrent with a contralateral recurrent IH.

Presentation of case: A 65-year-old man presented with symptomatic bilateral IH; the left IH was recurrent. Abdominopelvic computed tomography (CT) revealed a right IH with appendiceal herniation and left recurrent IH with omental fat. Using the prolene hernia system (PHS) mesh, the left recurrent IH underwent operation, followed by the right AH. The patient was in a good state with no recurrence 16 months postsurgery.

Discussion: If AH is accidentally encountered during surgery, the procedure should differ depending on the inflammatory state of the appendix. Simultaneously operating AH and contralateral recurrent IH is complicated; it is necessary to preoperatively decide which side to operate on first and whether to use an anterior or laparoscopic posterior surgical approach. If the planned operation is unattainable, alternative surgery should be considered. Fortunately, herein CT was performed prior to surgery, and the surgical plan was properly established.

Conclusion: Prior to simultaneous AH and contralateral recurrent IH surgery, the surgical plan should be established. If the planned surgical technique for recurrent hernia repair is not feasible, an alternative should be performed. In AH repair, different surgical methods are required depending on the presence and severity of inflammation of the appendix.

1. Introduction

Inguinal hernias (IHs) are the most common type of hernia, with sac contents primarily comprising the small intestine or omentum. Amyand's hernia (AH) is diagnosed when the appendix enters the IH sac and is rare [1], particularly when the contralateral recurrent IH is operated on simultaneously. The surgical method selected depends on the severity of inflammation of the herniated appendix, and it is difficult to select a surgical method, as it should be simultaneously operated on with the contralateral recurrent IH. This study presents a case of adult AH combined with contralateral recurrent IH and conforms to the SCARE criteria [2].

2. Presentation of case

A 65-year-old man presented with 1 year of intermittent discomfort in the right groin. He had undergone bowel resection for mechanical obstruction of the intestine in China, and left IH surgery in Korea 14 and 3 years prior, respectively. His drug, psychosocial, and family histories

were unremarkable. Physical examination revealed slight bulging in the right groin, with no tenderness or rebound tenderness in the right lower abdomen. Scars from the previous hernia surgery were present in the left groin and lower midline, and a protrusion was observed while standing (not supine). Outpatient abdominopelvic computed tomography (CT) revealed a right IH with appendiceal herniation, and left recurrent IH with omental fat (Fig. 1. A, B).

Regarding the left recurrent IH, surgical records indicate that while herniorrhaphy was initially approached laparoscopically, it was impossible due to severe intestinal adhesions; thus, herniorrhaphy was subsequently performed by Lichtenstein repair. Under general anesthesia, the left recurrent IH operation first using the prolene hernia system (PHS; Ethicon, Inc., Somerville, NJ, USA) mesh via an anterior approach, followed by the right AH [3].

The left recurrent IH was accessed through an incision at the previous surgical scar. While adhesion to the aponeurosis of the external oblique muscle was not severe, the defect corresponding with the external opening was enlarged due to migration of the existing mesh, and the mesh and surrounding tissues were severely adhered. After

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Fig. 1. Computed tomography images.

Contrast enhanced axial (A) and delayed coronal (B) abdominopelvic computed tomography images show a herniated appendix and omentum (arrow) in right inguinal hernia, small bowel and omentum (arrowhead) in left inguinal hernia via the lateral side of the inferior epigastric artery.

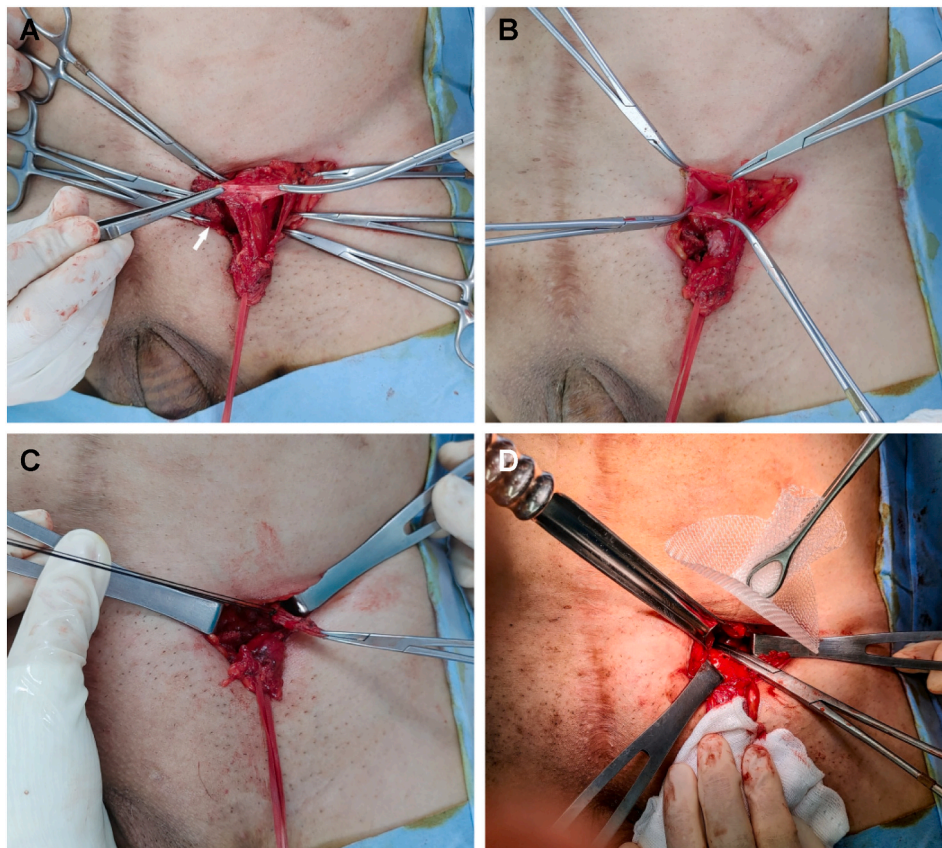


Fig. 2. Intraoperative findings of left recurrent inguinal hernia.

The hernial sac was in the spermatic cord and there was previous migrated mesh (arrow) (A). The hernial sac was opened, revealing no contents (B). The hernial sac was ligated (C), and a prolene hernia system mesh was inserted (D).

careful dissection, the previous mesh was removed, the spermatic cord was dissected and separated, and the cord lipoma was excised. The recurrent IH was an indirect IH. There were no contents in the hernial sac. The hernial sac was double ligated; mesh removal and adhesion detachment—used in the previous Lichtenstein surgery—went smoothly, and tension-free herniorrhaphy using the PHS was successfully completed using a medium-sized PHS mesh without damaging the spermatic cord structure, including the vas deferens. The abdominal wall was closed layer by layer and the skin was closed with subcuticular

sutures (Fig. 2. A, B, C, D).

For the right AH, an incision was made at the symmetrical point of the incision in the left IH. The right IH was also an indirect IH. The cord lipoma was removed, the internal spermatic fascia was incised, and the hernial sac was dissected. An incision was made in the middle of the hernial sac to observe the contents: the herniated omentum and appendix showed no signs of inflammation or swelling; they were carefully reduced into the peritoneal cavity, and the hernial sac was double ligated. Tension-free herniorrhaphy using PHS was successfully

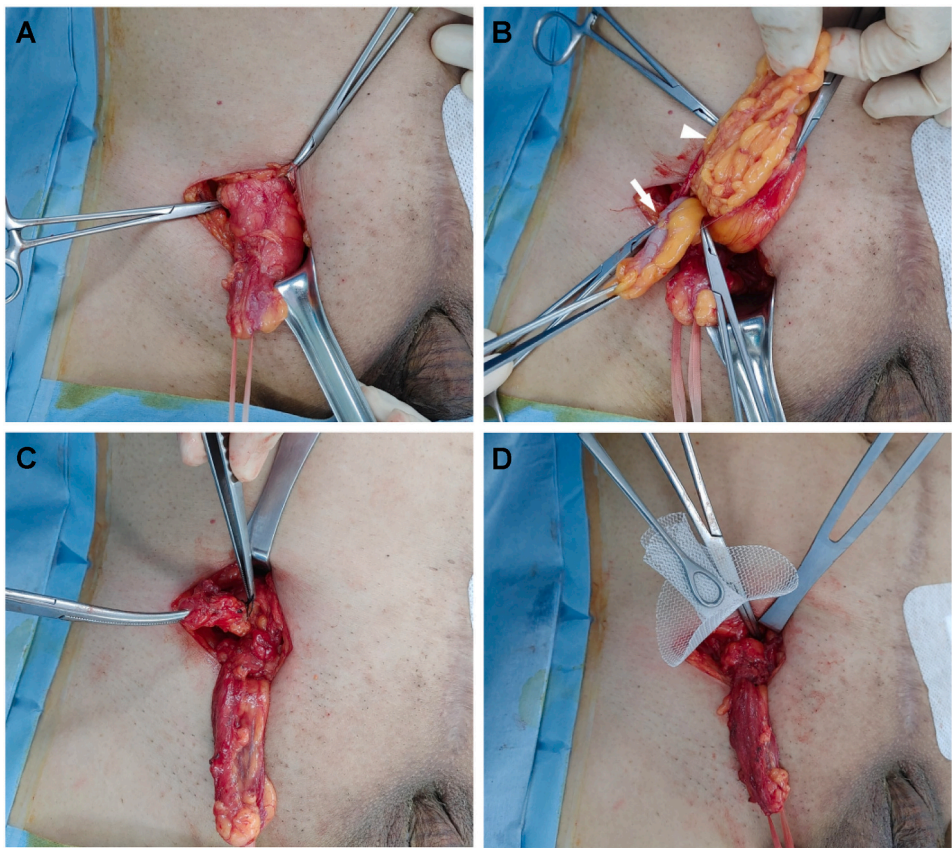


Fig. 3. Intraoperative findings of right Amyand's hernia. The hernial sac was in the spermatic cord (A). The hernial sac was opened, revealing the appendix (arrow) and omentum (arrowhead) (B). The hernial sac was ligated (C), and a prolene hernia system mesh was inserted (D).

completed using a medium-sized PHS mesh without damaging the spermatic cord structure. The abdominal wall was closed in the same manner as that for the contralateral IH (Fig. 3. A, B, C, D).

The patient was uneventfully discharged on postoperative day 2 and visited the outpatient department for check-ups 8 days. The patient was in a comfortable state with no recurrence 16 months after surgery. Written informed consent was obtained from the patient.

3. Discussion

Appendixes contained within the IH sac are named after Claudius Amyand [4], who first identified a perforated appendix and fecal fistula in the right IH sac of an 11-year-old boy in 1735. The contents of the IH sac are mostly the small intestine or omentum; the appendix rarely enters the IH sac, and is reported in 0.07–0.13 % of IHs [1]. If the contents of the hernial sac are unusual, it is named after the reporter; hernia with Meckel's diverticulum is called Littre's hernia, hernia with an anti-mesenteric small intestine wall is called Richter's hernia.

AH can occur in both children and adults; they are mainly indirect in adults, but can also be direct [5]. The present case describes an indirect IH. AH is thought to occur more frequently in children than adults, as the

hernial sac and appendix are often attached with fibrous tissue [6]. AH exhibits different symptoms depending on the condition of the incarcerated appendix and symptoms of general IH; thus, it exhibits various findings, from normal to perforating appendicitis with abscess. Because AH is rare and its symptoms are vague, it is easily misdiagnosed as incarcerated or strangulated IH; however, definitive diagnosis may be achieved by ultrasound or CT.

Imaging evaluations, such as ultrasound or CT, are not routinely used to diagnose IH. CT is performed when recurrent inguinal or strangulated inguinal hernia is suspected and when an inguinal hernia needs to be differentiated from an incisional hernia.

If AH is accidentally encountered during surgery, the surgical method should differ depending on the inflammatory state of the appendix. Regarding the surgical treatment of AH in children, even if appendectomy is performed through the hernial sac, there are no major problems regarding treatment as it does not significantly affect the high ligation of the hernial sac. Modern adult hernia surgery involves tension-free herniorrhaphy using a mesh; if acute appendicitis progresses and local inflammation is severe, or there are symptoms of peritonitis, the use of a mesh should be seriously considered.

Losanoff and Basson proposed treatment methods by classifying AH

Table 1
Pathological types of AH and their respective management.

Type of hernia	1	2	3	4
Salient features	Normal appendix	Acute appendicitis, localized in the sac	Acute appendicitis, peritonitis	Acute appendicitis, other abdominal pathology
Surgical management	Reduction or appendectomy (depending on age) mesh hernioplasty	Appendectomy through hernia, endogenous repair	Appendectomy through laparotomy, endogenous repair	Appendectomy, diagnostic workup and other procedures as appropriate

Source: Losanoff JE and Basson MD. Amyand hernia: a classification to improve management. *Hernia* 2008; 12: 325–6.

into four types based on the presence of inflammation of the appendix in the IH, the spread of inflammation in the abdominal wall and peritoneum, and the presence of additional lesions in the abdominal cavity (Table 1) [7].

They recommended that the use of a mesh be avoided with evidence of appendicitis. It would be better to avoid using a mesh in the presence of appendicitis, but if used limitedly for mild local inflammation, tension-free herniorrhaphy using a mesh may still be an available hernia surgery for adults [8].

In recurrent IH surgery, it is important to select a surgical method to reduce the recurrence rate. There are many opinions regarding the most appropriate surgery. Factors to consider are: the previous surgical method, especially the use of a mesh; location of the mesh when used; and characteristics of the patient (age, activity, occupation, risk of anesthesia) [9]. For recurrence of conventional open tissue repair without using a mesh, both anterior—such as Lichtenstein and open mesh repair (PHS, Perfix plug)—and posterior (using laparoscopy) approaches can be applied.

If a mesh was previously used, its location is important. Laparoscopic hernia repair is the preferred surgery for recurrence after Lichtenstein repair; otherwise, Lichtenstein repair is repeated, or surgery is performed with a mesh plug (Perfix plug). With no anterior abdominal wall adhesion for recurrence after laparoscopic herniorrhaphy, Lichtenstein repair can be easily performed; laparoscopic reoperation is also possible [9].

Lichtenstein or PHS repair with an anterior approach is preferred in my clinic, regardless of the previous hernia surgery and whether a mesh was used; if a mesh was previously used, it was removed and the adherent tissue carefully dissected to preserve inguinal abdominal wall structures, depending on the surgical field. With the anterior approach, I try to reconstruct the abdominal wall using all the techniques for hernia surgery. Laparoscopic herniorrhaphy may be the final option if a Lichtenstein or open mesh repair (PHS) cannot be performed due to severe adhesions and inability to preserve the abdominal wall structure.

Simultaneous operation of the right AH and left recurrent IH is complicated. I have been performing hernia repairs since 2002, but this is my first case of simultaneous AH and IH. Before surgery, it is necessary to decide the first operative side, and whether to use an anterior or laparoscopic posterior approach. If appendicitis was evident on the right AH, the right IH would have been repaired first according to the treatment methods of Losanoff and Basson's classification; subsequently, the recurrent left IH would have been repaired in stages after recovery. If the planned recurrent IH operation is not possible, an alternative surgical method should be carefully considered. Fortunately, in this case, CT was performed prior to surgery to confirm that there was no appendicitis, and the surgical plan was properly established as I was informed that laparoscopic repair was impossible due to severe intraabdominal adhesions at other hospitals.

4. Conclusion

In this case, symptomatic right inguinal hernia was diagnosed as AH on preoperative CT, and its repair was performed simultaneously with that of contralateral recurrent IH and with favorable outcomes. Prior to simultaneous AH and contralateral recurrent IH repair, the surgical plan should be established. If the planned technique for recurrent hernia repair is not feasible, an alternative should be performed. In repair of AH, different surgical methods are required depending on the presence and severity of inflammation of the appendix.

Provenance and peer review

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Declaration of competing interest

None.

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Ethical approval

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Guarantor

TGH accepts the full responsibility for the article.

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Consent

Written informed consent was obtained from the patient. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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