

# Strangulated Amyand Hernia and Gangrene of Right Testis

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**Abstract:** *Background:* Amyand hernia is a type of inguinal hernia that contains the vermiform appendix in its sac and is reported to have prevalence of 0.9 - 1.7% of all inguinal hernia cases. Inflammation and strangulation is extremely rarer and constitutes around 0.1% of all amyand hernia cases. Though the preoperative diagnosis is difficult in case of strangulated amyand hernia, it is usually an incidental intraoperative finding. Ultrasound scan and contrast enhanced computed tomography may help in establishing the diagnosis pre - operatively if the patient condition allows us to perform. *Clinical Case:* A 72 - year - old male with history of right inguinal hernia, who is complaining of irreducible swelling 10 days prior to admission characterized by pain and fluctuating mass in right inguinal region. The patient was planned for urgent surgical intervention along with right inguinal herniorrhaphy, showing a gangrenous appendix with cecal perforations and gangrenous right testis as an intraoperative finding, along with purulent collection of around 100ml in right scrotum. Ileocecal resection with right high inguinal orchidectomy was performed by laparotomy and right inguinal herniorrhaphy with Bassini technique without apparent complications. Post - operatively the patient was managed in AEICU and adequate recovery was noticed. *Conclusion:* Most of the cases of amyand hernia are diagnosed intraoperatively and a preoperative diagnosis is rarely made. Management should be individualized according to appendix' inflammation stage, presence of abdominal sepsis, and comorbidity factors. The decision should be based on factors such as the patient's age, the size and anatomy of the appendix, and in case of appendicitis, standard appendectomy and herniorrhaphy without a mesh should be the standard of care. If the appendix is found to be inflamed, the chances of morbidity and mortality increases. Amyand's hernia is commonly misdiagnosed as an ordinary incarcerated hernia.

**Keywords:** Amyand Hernia; Appendicitis; ileocecal resection; strangulation

## 1. Introduction

The term "Amyand hernia" was first suggested by Creese in 1953, then by Hiatt and Hiatt in 1988, later by Hutchinson in 1993, in honour of Claudius Amyand. Claudius Amyand (1680 - 1740) was a military surgeon, later Surgeon to King George II, Fellow of the Royal Society, first Principal Surgeon to the Westminster Hospital, and the founder and first Principal Surgeon to St. George's Hospital. He had the privilege to perform the first successful appendectomy in 1735 on 11 year old boy, Hanvil Anderson. It is extremely

rare to find an gangrenous appendix in the obstructed inguinal hernia pre - operatively, as diagnosed by Singal R et al in his study. They have defined it using the term incarcerated hernia.

Nyhus has given the classification for groin hernia in 1991 emphasizing towards size of internal ring and posterior wall defect. Later, Losanoff and Basson came with new classification for Amyand hernia depending on intra - abdominal pathology along with appendicitis.

### NYHUS Classification for Amyand Hernia

Type 1	Indirect inguinal hernia with a normal ring Sac in the canal
Type 2	Indirect hernia with an enlarged internal ring but the posterior wall is intact; inferior deep epigastric vessels not displaced, sac not in scrotum
Type 3a	Direct hernia with a posterior floor defect only
Type 3b	Indirect hernia with an enlargement of internal ring and posterior floor defect
Type 3c	Femoral hernia
Type 4	Recurrent hernia A direct B indirect C femoral D combination of A- B- C

### LOSANOFF and Basson Classification for Amyand Hernia

Types of AH	Features	Surgical Management
Type 1	Normal appendix within the inguinal hernia	Reduction of appendix or appendectomy and mesh hernioplasty
Type 2	Acute appendicitis with no abdominal sepsis	Appendectomy through the hernia and sutured hernioplasty
Type 3	Acute appendicitis with abdominal sepsis	Appendectomy through laparotomy with sutured hernioplasty
Type 4	Acute appendicitis is associated with related or unrelated abdominal pathology	Appendectomy through hernia or laparotomy plus diagnostic workup

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## 2. Case Presentation

A 72 - year - old male with history of cigarette smoking for last 12 years, with no history of previous surgical intervention, presented with painless swelling of 2cm x 2cm in the right inguinal region, gradually increasing in size which remained asymptomatic and reducible till last 10 days, after which he started complaining of irreducibility and pain over the swelling in right inguinal area, for which he was referred to our centre for urgent surgical intervention. He had follow up of the chief complaint by the general surgery outpatient clinic, where the right inguinal hernia was diagnosed clinically in 2023 but the patient denied for any operative intervention.

In March 2024, the patient was referred to our side with chief complaints of disorientation and respiratory distress along with pain and irreducible swelling in right inguinal region. The patient is also giving history of nausea, vomiting and raised temperature which was relieved by medications. On chest and abdominal radiographs, air below diaphragm was present, making a diagnosis of strangulated inguinal hernia with hollow viscus perforation. The patient was

admitted in emergency and resuscitation begins. Routine blood testing was done which revealed raised leucocytes (32300/mm<sup>3</sup>) and neutrophils (82%) and arterial blood gas analysis revealed raised lactate and acidosis. He was examined by our team finding and on physical examination the peristaltic sounds were sluggish along with the presence of redness, tenderness, shiny skin, erythema, edema, local temperature raise, without ulceration or discharge, of approximately 11 cm in diameter, painful on palpation and cough impulse was absent. Emergency Surgical intervention with inguinal exploration was indicated.

Right inguinal incision was given and subcutaneous tissue was dissected. External oblique aponeurosis was divided and superficial ring opened. Around 100ml of foul smelling purulent exudate was aspirated and indirect inguinal hernia was present of approximately 2 cm, whose content was found to be a gangrenous cecal appendix with multiple cecal perforations with necrotic changes at base of appendix spreading towards caecum. Right sided testicular necrosis was present upon testicular exploration. Midline infraumbilical exploratory laparotomy was performed to evaluate the proximal and distal bowel.

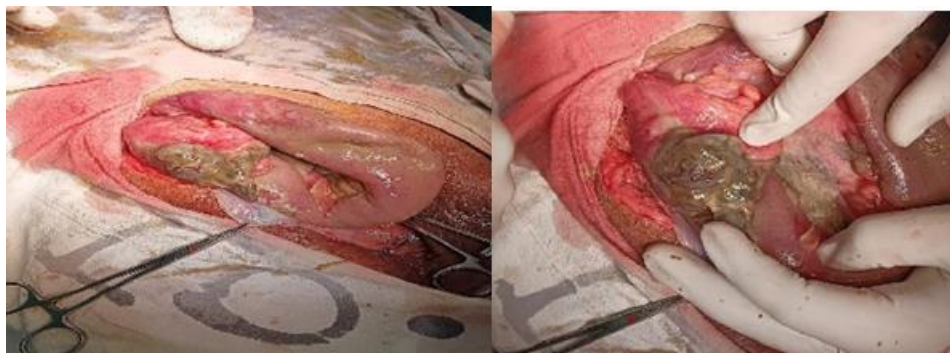


Figure showing gangrenous appendix with gangrene involving base of caecum and multiple cecal perforations.

Management should be individualized according to appendix's inflammation stage, presence of abdominal sepsis, and comorbidity factors. Ideally in case of inflamed appendix within hernia, standard appendectomy and herniorrhaphy without a mesh should be the standard of care. But in our scenario, gangrene has extended to caecum for which standard appendectomy won't suffice. Resection of ileocecal junction with right high inguinal orchidectomy with proximal loop ileostomy formation was done. Right inguinal region was cleaned and right herniorrhaphy was done with Bassini technique. Excised specimen was sent for Histopathological Examination which revealed gangrenous appendix involving caecum with no signs of malignancy. Post - operatively the patient was shifted to Post- operative ward and regular cleaning and dressing was done. Ileostomy became functional on POD - 2 and patient was allowed for oral intake. No surgical site infection was identified in post - op period and patient was planned for discharge on POD - 5 with no complications at present.

## 3. Discussion

Acute appendicitis is one of the most common surgical

emergencies. The presence of appendix within an inguinal hernia sac is rare finding, present in less than 1% of cases and the presence of gangrenous appendix in this location is even rarer, present in only 0.1% of patients. Claudius Amyand, a military surgeon first described this condition in an 11 - year - old patient, Hanvil Anderson, whose management consisted of performing appendectomy. Other rare locations have also been reported with atypical presentations, such as Garengeot's hernia, characterized by presence of the appendix within a femoral hernia, with less than 200 cases described in the literature, almost resembles to amyand hernia clinically.

Peritoneal contamination and intra - abdominal manifestations are rare. The best study for diagnosis of inguinal hernia is abdominopelvic computed tomography which reveals the presence of the cecal appendix and status of appendix. The standard treatment of choice for Amyand's hernia is appendectomy through herniorrhaphy incision (extraperitoneal approach) preferably but if appendicitis is present or peritoneal contamination is seen, midline infraumbilical laparotomy is preferred. Mesh repair is not preferred in cases where inflammation or peritoneal contamination or sepsis is present. For this reason, herniorrhaphy with Bassini technique is preferred.

#### 4. Conclusion

Amyand's hernia is rare form of inguinal hernia and strangulation is even rarer. Since hernia is usually diagnosed clinically, so pre - operative diagnosis of amyand hernia is very difficult as high suspicion is required given the low incidence of this pathology. The best diagnostic imaging for amyand hernia is abdominopelvic computed tomography which reveals appendix within hernial sac and inflammatory status. The standard management of choice for amyand hernia is always surgical exploration by performing an appendectomy or reduction of the hernial content and repair of the hernia defect with or without the use of mesh according to the clinical characteristics of the patient and the risk of contamination. If there is peritoneal contamination along with gangrene of appendix and especially in cases involving the base at caecum, ileocecal resection should be preferred over appendectomy.

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