DOI: https://doi.org/10.5281/zenodo.20599126

ISR Journal of Surgery (ISRJS)

Homepage: https://isrpublisher.com/isrjs/

Volume 02, Issue 06, June 2026 ISSN: 3107-8621 (Online)

Necrotizing Fasciitis Secondary to Perforated Appendicitis within an Inguinal Hernia Sac: A Case Report and Review of the Literature

Hamza El Hamdani[1]*, Talha Laalou[1], Asmae El Hamdani[1], Mohammed Hamid[1], Rahal Mssrouri[1], Jalil Mdaghri[1], Said Benamar[1]

[1]Department of Surgery B, Ibn Sina University Center of Rabat, Faculty of Medicine and Pharmacy of Rabat, University Mohammed V, Rabat, Morocco

***Corresponding author:** Hamza El Hamdani
Department of Surgery B, Ibn Sina University Center of Rabat, Faculty of Medicine and Pharmacy of Rabat, University Mohammed V, Rabat, Morocco

Article History

Received: 22-03-2026

Accepted: 30-05-2026

Published: 05-06-2026

Abstract: **Case Report**

Background: Necrotizing fasciitis (NF) is a rapidly progressive, life-threatening soft tissue infection requiring immediate surgical debridement and broad-spectrum antibiotic therapy. Its association with perforated appendicitis within an inguinal hernia sac a condition known as a De Garengeot hernia variant is exceedingly rare and carries a high risk of delayed diagnosis owing to its atypical presentation. ***Case Report*:** A 50-year-old male with a history of ocular hypertension and gout presented with a painful swelling of the right iliac fossa extending to the right flank. Physical examination revealed a firm, warm, and tender non-fluctuant mass with an associated uncomplicated right inguinal hernia. Laboratory investigations demonstrated a marked inflammatory response (WBC 24,000/mm³, CRP 396 mg/L) with concurrent acute kidney injury, precluding the use of intravenous contrast. Non-contrast CT identified two intraperitoneal collections in the right iliac fossa (9×7 cm and 6×7 cm) extending to the right psoas muscle, along with a 6×13 cm gas-containing parietal collection of the right lateral abdominal wall, consistent with an abscess. Following multidisciplinary review, the patient underwent emergency laparotomy with peritoneal drainage and cutaneous necrosectomy. Intraoperative findings revealed a perforated, inflamed appendix incarcerated within the right inguinal hernia sac. Appendicectomy was performed laparoscopically. Daily wound care was carried out in theatre, and the patient was discharged after 10 days with a favorable outcome. ***Conclusion*:** Perforated appendicitis within an inguinal hernia sac complicated by necrotizing fasciitis is a rare surgical emergency. The diagnosis relies on a high index of clinical suspicion and early CT imaging. A combined surgical approach laparoscopic appendicectomy, open drainage, and aggressive soft tissue debridement is essential to optimize outcomes.

Keywords: Necrotizing Fasciitis, Perforated Appendicitis, Inguinal Hernia, De Garengeot Hernia, Amyand Hernia, Surgical Emergency, Necrosectomy.

INTRODUCTION

The presence of the vermiform appendix within an inguinal hernia sac was first described by Amyand in 1735 and is referred to as an Amyand hernia [3]. This condition is estimated to occur in approximately 1% of all inguinal herniorrhaphies and represents an uncommon but well-recognized incidental finding [3, 15].

Perforation of the appendix within the hernia sac, however, is a far rarer event, reported in fewer than 0.1% of cases, and carries a substantially increased risk of infectious and septic complications [3, 8].

Necrotizing fasciitis (NF) is a devastating, rapidly progressive infection of the fascia and subcutaneous tissues, classically

characterized by extensive necrosis, systemic toxicity, and high mortality if not treated with immediate and aggressive surgical debridement [9, 13]. When arising in the context of an intraperitoneal septic focus such as a perforated appendix confined within a hernial sac the infectious process can spread contiguously along fascial planes to involve the abdominal wall and perineum, giving rise to a variant of Fournier's gangrene [4, 5].

The diagnostic challenge in such cases is considerable. The clinical presentation may initially be attributed to a complicated inguinal hernia, an abdominal wall abscess, or an appendicular mass, thereby delaying recognition of the underlying necrotizing process [9, 12].

Computed tomography (CT) has emerged as the imaging modality of choice for preoperative characterization of soft tissue gas, fascial plane involvement, and extension of collections [6].

We report the case of a 50-year-old male who presented with necrotizing fasciitis of the right abdominal wall and iliac fossa secondary to appendicitis with perforation within an inguinal hernia sac. We discuss the pathophysiological mechanisms, the diagnostic approach, and the surgical management strategy in the context of a review of the relevant literature.

CASE REPORT

Clinical Presentation

A 50-year-old male with a past medical history of ocular hypertension and gout presented to the emergency department with a painful swelling of the right iliac fossa (RIF) extending progressively to the right flank over several days. He denied nausea, vomiting, or fever at home. No history of recent trauma or anticoagulant use was reported.

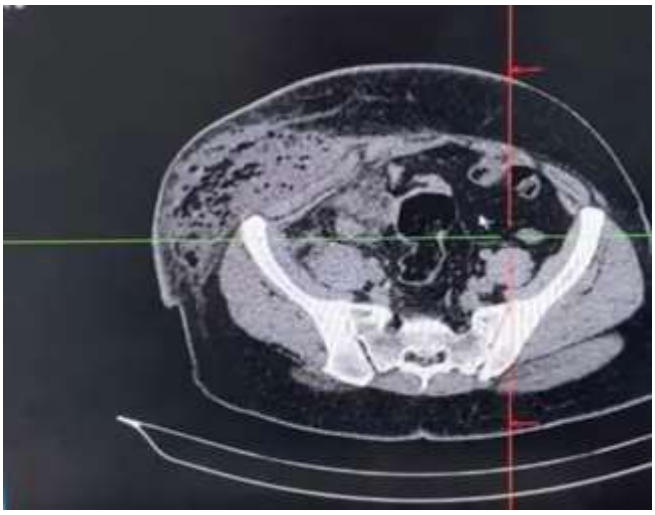
On physical examination, the patient was afebrile and hemodynamically stable. Examination of the abdomen revealed a firm, warm, tender, and non-fluctuant mass occupying the right iliac fossa and right flank. The overlying skin showed signs of early erythema without crepitus on palpation. A separate, reducible right inguinal hernia without signs of incarceration or strangulation was noted. There was no peritonism on abdominal examination.

Laboratory and Imaging Investigations

Laboratory investigations demonstrated a marked biological inflammatory syndrome: white blood cell count (WBC) 24,000/mm³, C-reactive protein (CRP) 396 mg/L. Renal function revealed acute kidney injury (urea 0.8 g/L, creatinine 20 mg/L). Serum electrolytes, coagulation parameters, and liver function tests were within normal limits.

In view of the acute kidney injury, intravenous contrast was withheld on the advice of the nephrology team. Non-contrast enhanced abdominopelvic CT was performed and demonstrated:

- A well-defined, gas-containing collection of the right lateral abdominal wall measuring 6×13 cm, consistent with a parietal abscess with suspected necrotizing component;
- Two contiguous intraperitoneal fluid collections in the right iliac fossa measuring 9×7 cm and 6×7 cm respectively, extending to the level of the right psoas muscle;
- No abnormality of the liver, kidneys, adrenal glands, spleen, or pancreas.



The overall CT conclusion was consistent with multi-compartmental collections of the right iliac fossa and right lateral abdominal wall, highly suggestive of an abscessed process. The appendix was not clearly individualized on the non-contrast study. No extraluminal free air was identified.

Multidisciplinary Review and Operative Decision

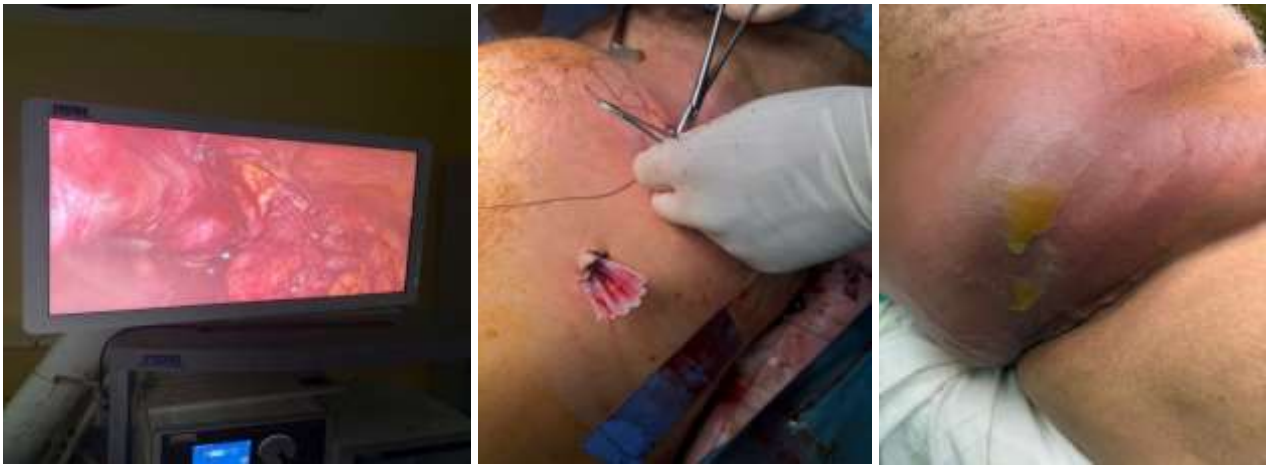
The case was presented at a multidisciplinary surgical board. Given the clinical picture of sepsis with a necrotizing soft tissue component, rapidly expanding parietal collection, and intraperitoneal collections in close proximity to major retroperitoneal structures, a decision for emergency operative intervention was made.

The planned procedure included: exploratory laparotomy with peritoneal drainage, cutaneous necrosectomy, and wound debridement.

Intraoperative Findings and Procedure

Under general anaesthesia, exploratory laparotomy via a midline incision was performed. Intraoperative findings included:

- A localized peritonitis of the right iliac fossa with purulent peritoneal collections consistent with the CT findings;
- An inflamed, gangrenous, and perforated appendix, incarcerated within the right inguinal hernia sac, the hernia sac serving as the primary focus of infection and the gateway for fascial plane contamination;
- Necrotizing fasciitis of the right abdominal wall with fascial plane dissection extending subcutaneously towards the right flank.



Following wide peritoneal lavage with warm saline, laparoscopic appendicectomy was performed via standard three-port technique. The hernia sac was opened, the perforated appendix retrieved, and appendicectomy completed with endoloop ligation of the base. Drainage of the peritoneal collections was achieved by placing two closed-suction drains in the right iliac fossa. Cutaneous necrosectomy was performed with wide excision of necrotic fascia and subcutaneous tissue until viable, bleeding margins were obtained. The resulting wound was left open for staged closure.

Postoperative Course

Postoperative management included broad spectrum intravenous antibiotic therapy (piperacillin-tazobactam combined with metronidazole), thromboprophylaxis, and daily wound care performed under general anaesthesia in the operating theatre.

Nutritional support was initiated early. Renal function progressively normalized under medical management.

The patient demonstrated a favorable clinical evolution. Wound care allowed progressive granulation tissue formation over the debridement site.

Systemic inflammatory markers normalized by postoperative day 6. Drains were removed sequentially.

The patient was discharged on postoperative day 10 in satisfactory condition, with outpatient wound follow-up arranged.

DISCUSSION

Amyand Hernia and its Complications

The Amyand hernia, defined by the presence of the vermiform appendix within the inguinal hernia sac, has an overall prevalence of approximately 1% among inguinal hernias [3, 15].

The appendix may be found in varying states: normal, inflamed, or as in our case gangrenous and perforated.

Losanoff and Basson proposed a classification system stratifying Amyand hernias into four types based on the state of the appendix and the presence of concurrent abdominal or systemic pathology, which guides operative strategy [15].

Perforation of the appendix within the hernia sac is particularly hazardous because the anatomical confinement of the sac impedes spontaneous drainage while providing a direct conduit for infection to spread along the inguinoscrotal and abdominal wall fascial planes [3, 8].

This mechanism represents a well-established pathway for the development of Fournier's gangrene in males and is analogous to the extension of colonic or sigmoid perforation-related infections to the extraperitoneal soft tissues [4, 5].

Necrotizing Fasciitis: Pathophysiology and Diagnostic Challenges

Necrotizing fasciitis is a severe, rapidly progressive infection characterized by necrosis of the superficial fascia and subcutaneous tissues, with relative sparing of the overlying skin in early stages [9, 13].

Two microbiological subtypes are recognized: Type I (polymicrobial, most common in immunocompromised or diabetic patients) and Type II (monomicrobial, predominantly Group A Streptococcus) [13].

In cases arising from gastrointestinal sources, as in our patient, a polymicrobial pattern involving enteric Gram-negative organisms and anaerobes is typically encountered [9].

The diagnostic challenge lies in the frequently insidious onset and the discordance between skin appearance and depth of tissue involvement, particularly in the early phase. The classic presentation of skin necrosis, bullae, and crepitus is a late manifestation, and its absence should not preclude the diagnosis [12, 13].

Laboratory markers such as elevated WBC and CRP, combined with a high Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score, can assist in risk stratification, although their sensitivity is imperfect [7, 13].

CT imaging is the cornerstone of preoperative diagnosis, with a reported sensitivity of 88.5% and specificity of 93.3% for NF [6]. The hallmark CT finding is the presence of gas along fascial planes, which was clearly demonstrated in our patient as a gas-containing parietal collection. Additional findings include asymmetric fascial thickening, fluid tracking along facial planes, and fat stranding [6, 12]. Even in the absence of intravenous contrast, as in our case due to acute kidney injury, the presence of subcutaneous gas is a pathognomonic finding sufficient to warrant emergency surgical exploration [6].

Surgical Management

The treatment of NF is a surgical emergency and is not amenable to conservative management alone. The principles of surgical treatment include:

- Early and aggressive debridement of all necrotic fascia and subcutaneous tissue until viable bleeding margins are achieved;
- Drainage of all purulent collections;
- Management of the primary source of infection;
- Open wound management with planned re-look procedures [9, 11, 13].

In the present case, the primary infectious source, the perforated appendix within the hernia sac was addressed laparoscopically, which is an increasingly accepted approach for Amyand hernia with perforation in haemodynamically stable patients [3, 15]. This minimally invasive technique allowed safe retrieval of the appendix, thorough peritoneal lavage, and drainage of intraperitoneal collections, while the open laparotomy wound was concurrently used for parietal necrosectomy. This combined approach represents a rational surgical strategy in selected cases.

Re-look procedures with daily wound debridement under anaesthesia, as performed in our patient, are widely advocated to ensure completeness of necrosectomy and to monitor for disease progression [9, 11].

Negative-pressure wound therapy (NPWT) may be considered as an adjunct to accelerate wound bed preparation prior to delayed primary closure or skin grafting, though it was not employed in our case [11].

Antibiotic Therapy

Broad-spectrum antibiotic therapy targeting the polymicrobial flora typical of gastrointestinal source NF is mandatory and should be initiated immediately upon diagnosis [10, 13].

Empirical regimens combining a beta-lactam/beta-lactamase inhibitor (such as piperacillin-tazobactam) with metronidazole, or carbapenem-based regimens, are appropriate first-line choices [10].

Duration of therapy should be guided by clinical response, serial inflammatory markers, and microbiological culture results.

In our patient, renal dose adjustment was required owing to the concurrent acute kidney injury [10].

Prognostic Considerations

Mortality from NF ranges from 20 to 40% in published series and is influenced by the extent of tissue involvement, patient comorbidities, time to surgical intervention, and the presence of organ failure [13, 14].

Prognostic scoring systems including the LRINEC score, the Fournier's Gangrene Severity Index (FGSI), and serum lactate levels have been proposed as predictors of mortality [7, 14].

In our patient, the absence of hemodynamic instability, the contained nature of the peritoneal contamination, and the timely surgical intervention likely contributed to the favorable outcome.

CONCLUSION

Necrotizing fasciitis secondary to perforated appendicitis within an inguinal hernia sac is an exceptional and life-threatening surgical emergency.

Its clinical presentation is frequently misleading, with early features mimicking a complicated inguinal hernia or an abdominal wall abscess.

A high index of suspicion, prompt CT imaging, and immediate multidisciplinary surgical management are paramount to survival.

The combined approach of laparoscopic appendicectomy for source control and open necrosectomy for soft tissue debridement represents a feasible and effective strategy in hemodynamically stable patients. Systematic daily wound re-assessment and staged wound closure are key components of postoperative management.

This case adds to the sparse literature on this rare complication of Amyand hernia and reinforces the need for surgical vigilance in patients presenting with right iliac fossa and right flank sepsis of unclear etiology,

particularly when an inguinal hernia is concurrently present.

REFERENCES

1. Ameh, E. A., Mshelbwala, P. M., & Nmadu, P. T. (2003). Complicated inguinal hernia in children. *Pediatr Surg Int*, *19*(6), 433–435.
2. Fry, D. E., Milholen, L., & Harbrecht, P. J. (1983). Iatrogenic perforation of the appendix. *Surgery*, *93*(3), 424–427.
3. Golash, V. (2007). Appendix in an inguinal hernia sac. *J Indian Med Assoc*, *105*(2), 100.
4. Ghnnam, W. M. (2008). Fournier′ s gangrene in Mansoura Egypt: A review of 74 cases. *Journal of Postgraduate Medicine*, *54*(2), 106-109.
5. Laucks, S. S. (1994). Fournier's gangrene. *Surg Clin North Am*, *74*(6), 1339–1352.
6. Levenson, R. B., Singh, A. K., & Novelline, R. A. (2008). Fournier gangrene: role of imaging. *Radiographics*, *28*(2), 519-528.
7. Mallikarjuna, M. N., Vijayakumar, A., Patil, V. S., & Shivswamy, B. S. (2012). Fournier's gangrene: current practices. *International Scholarly Research Notices*, *2012*(1), 942437.
8. Meyers, M. A., Oliphant, M., Berne, A. S., & Feldberg, M. A. (1987). The peritoneal ligaments and mesenteries: pathways of intraabdominal spread of disease. *Radiology*, *163*(3), 593-604.
9. Roje, Z., Roje, Ž., Matić, D., Librenjak, D., Dokuzović, S., & Varvodić, J. (2011). Necrotizing fasciitis: literature review of contemporary strategies for diagnosing and management with three case reports: torso, abdominal wall, upper and lower limbs. *World Journal of Emergency Surgery*, *6*(1), 46.
10. Schein, M., Wittmann, D. H., & Lorenz, W. (1996). Duration of antibiotic treatment in surgical infections of the abdomen. Setting the research agenda. *Eur J Surg*, (576), 35–44.
11. Soreide, K., & Soreide, J. A. (2008). Necrotizing fasciitis and its correlation with systemic inflammatory response syndrome, organ failure and mortality: a prospective clinical study. *Eur J Trauma Emerg Surg*, *34*(3), 273–281.
12. Subramaniam, M. H., Liscum, K. R., & Hirshberg, A. (2003). The floating harbor sign in necrotizing fasciitis: a new diagnostic sign. *J Trauma*, *54*(2), 319–321.
13. Wong, C. H., Chang, H. C., Pasupathy, S., Khin, L. W., Tan, J. L., & Low, C. O. (2003). Necrotizing fasciitis: clinical presentation, microbiology, and determinants of mortality. *JBJS*, *85*(8), 1454-1460.
14. Yaghoubian, A., de Virgilio, C., Dauphine, C., Lewis, R. J., & Lin, M. (2007). Use of admission serum lactate and sodium levels to predict mortality in necrotizing soft-tissue infections. *Archives of Surgery*, *142*(9), 840-846.
15. Zinner, M. J., & Ashley, S. W. (2013). Maingot's Abdominal Operations. 12th ed. New York: McGraw-Hill.