

A Rare Coexistence: Gangrenous Cystitis and Necrotizing Fasciitis

© Melih Bıyıkoğlu¹, © Gizem Aydın², © Yasemin Yuyucu Karabulut², © Erim Erdem¹

¹Mersin University Hospital, Clinic of Urology, Mersin, Türkiye

²Mersin University Hospital, Clinic of Pathology, Mersin, Türkiye

Abstract

Gangrenous cystitis is an exceedingly uncommon diagnosis characterized by bladder mucosa and submucosal necrosis. The presence of non-specific symptoms and signs complicates the diagnostic process. Necrotizing fasciitis is a rare infection affecting the deep soft tissues, causing progressive destruction of the muscle fascia and rapid systemic spread. This study aimed to elucidate the atypical presentation of rare gangrenous cystitis in the literature, highlighting its potential to lead to necrotizing fasciitis. An 82-year-old female patient was admitted with abdominal and pelvic pain complaints. Computed tomography of the lower abdomen revealed free air-fluid densities in the pelvic region, raising the suspicion of intestinal perforation. Exploratory laparotomy diagnosed the patient with gangrenous cystitis and necrotizing fasciitis. Pathological examination confirmed the presence of necrosis. In patients presenting with acute abdominal symptoms, when free air-fluid levels are observed in imaging studies of the pelvis, rare diagnoses such as gangrenous cystitis should not be overlooked, even if the patient's history indicates anuria.

Keywords: Gangrenous cystitis, necrotizing cystitis, necrotizing fasciitis, acute abdomen, peritonitis

Introduction

Gangrenous cystitis, characterized by necrosis of the bladder mucosa and submucosa, can progress to involve the entire bladder wall and result in spontaneous rupture (1). Its etiology includes infections, chemical and physical irritations, and conditions leading to circulatory disturbances. It primarily affects patients with comorbidities such as diabetes, stone disease, spinal cord injuries, and pelvic malignancies (2). The rarity of this disease contributes to challenges in diagnosis, often leading to delayed identification and increased mortality. Researchers have explored the etiology, presentation, and management of gangrenous cystitis in the current literature, emphasizing the significance of prompt and aggressive surgical intervention (3). Necrotizing soft tissue infections are infrequent yet rapidly advancing bacterial infections with high morbidity and mortality rates (4). Necrotizing fasciitis, an uncommon yet life-threatening infection affecting the skin, soft tissue, and muscle, spreads along fascial planes at a rate of 2-3 cm/h, causing fascial destruction (5). This study contributes a unique clinical, radiological, and histological case of the coexistence

of gangrenous cystitis and necrotizing fasciitis to the medical literature.

Case Presentation

An 82-year-old female patient presented to the emergency department with a 2-day history of abdominal pain. The patient had chronic kidney failure and had been anuric for 20 years, requiring dialysis. In addition, she had diabetes mellitus and chronic atrial fibrillation. Physical examination revealed no evident wounds or signs of infection on the skin. Abdominal examination demonstrated guarding and rebound tenderness. Laboratory results indicated an elevated C-reactive protein level of 424 mg/L and a white blood cell count of $7.31 \times 10^3/\mu\text{L}$. Computed tomography revealed diffuse intestinal dilation and air-fluid levels. Suspecting mesenteric ischemia and accompanying intestinal perforation, exploratory laparotomy was scheduled (Figure 1).

The surgical procedure revealed necrotic sections in the lower part of the rectus abdominis, rectus fascia, and parietal peritoneum extending superiorly to the bladder. Consultation with a urologist confirmed extensive necrosis in the superior,

Correspondence: Melih Bıyıkoğlu MD, Mersin University Hospital, Clinic of Urology, Mersin, Türkiye

E-mail: melihbiyikoglu@yahoo.com **ORCID-ID:** orcid.org/0000-0002-4798-7389

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right lateral, and posterior bladder walls (Figure 2). Further debridement was performed to preserve viable tissue margins. The patient underwent cystectomy, and tissue samples were sent for pathological and microbiological assessment. Histological analysis indicated fat necrosis and an inflammatory cell infiltrate rich in polymorphonuclear leukocytes on a necrotic fibrotic background (Figure 3). Despite early surgical intervention and



Figure 1. Air-fluid levels in the pelvic region

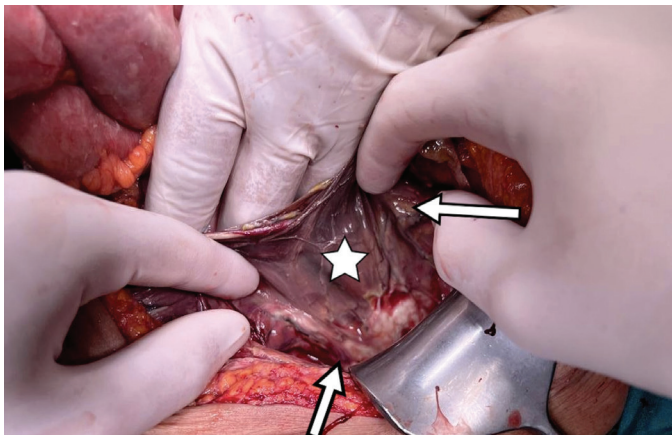


Figure 2. Intraoperative view of the bladder

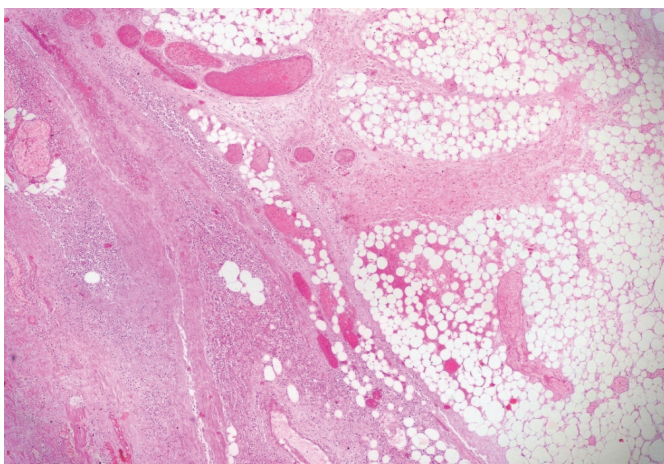


Figure 3. Diffused necrosis and inflammation, x40

antibiotic therapy, the patient succumbed to cardiopulmonary arrest due to septic shock 2 days after surgery.

Discussion

Gangrenous cystitis was initially documented by Willis (6) in 1650. The advent of broad-spectrum antibiotics has significantly reduced its incidence. It involves necrosis of the bladder mucosa and submucosa, potentially leading to spontaneous perforation and secondary acute peritonitis (7). The prognosis remains unfavorable, with a mortality rate of approximately 35%. Etiological factors include infections causing bladder wall ischemia, vascular obstruction, chronic urinary retention, radiation and chemotherapy, prior surgeries, and trauma. Comorbidities, such as diabetes mellitus, are frequently associated with bladder wall ischemia (8). Diagnostic challenges arise from a lack of distinctive symptoms. Common manifestations include lower abdominal pain, dysuria, hematuria, and pyuria (2,9), which may progress to acute abdomen or urosepsis.

Imaging techniques, including ultrasound, computed tomography, cystography, and cystoscopy, aid in diagnosis. Early surgical debridement is generally imperative, and there is a potential need for urinary diversion (10). Partial cystectomy is considered if the trigone is intact, whereas advanced cases may necessitate radical cystectomy (10).

In this case, despite the patient's anuria, a bladder-derived infection may have triggered gangrenous cystitis although histological confirmation is lacking. In addition, vascular obstruction from the patient's underlying conditions might have compromised bladder blood flow. The aggressive surgical approach involved extensive debridement and partial cystectomy. Delays in presentation, advanced sepsis, and comorbidities likely contributed to the unfavorable outcome.

Conclusion

In patients presenting with acute abdominal symptoms, when free air-fluid levels are observed in imaging studies of the pelvis, rare diagnoses such as gangrenous cystitis should not be overlooked, even if the patient's history indicates anuria.

Ethics

Informed Consent: Verbal and written informed consent was obtained from the patient for the study.

Authorship Contributions

Surgical and Medical Practices: M.B., G.A., E.E., Concept: M.B., Y.Y.K., E.E., Design: M.B., Data Collection or Processing: G.A., Y.Y.K., Analysis or Interpretation: G.A., Y.Y.K., E.E., Literature Search: M.B., Writing: M.B.

Conflict of Interest: No conflict of interest was declared by the authors.

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