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A Case Report on Fournier's Gangrene with Retroperitoneal Extension

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ABSTRACT

Fournier's gangrene (FG) is a rapidly progressing, life-threatening soft tissue infection characterized by necrosis of the genital, perineal, and perianal regions. While the disease primarily affects superficial tissues, it can extend to deeper structures, including the retroperitoneum, which significantly complicates its clinical management and increases its mortality rate. This case report describes a 53-year-old male who developed Fournier's gangrene with retroperitoneal extension, highlighting the challenges in diagnosis, management, and the importance of early intervention. The patient, with a medical history of poorly controlled diabetes mellitus, hypertension, and obesity, presented to the emergency department with complaints of severe pain, swelling, and erythema in the genital and perineal areas. His symptoms rapidly worsened over a 24-hour period, accompanied with systemic signs of sepsis, including fever, tachycardia, and hypotension. Clinical examination revealed extensive necrosis involving the scrotum, perineum, and surrounding tissues, with crepitus suggesting gas formation. A CT scan has been conducted, revealing not only the localized tissue destruction but also the extension of the infection into the retroperitoneal space, indicating the severity of the disease. The patient was immediately started on broad-spectrum intravenous antibiotics and underwent urgent surgical debridement to remove necrotic tissue. Further supportive care was provided in the intensive care unit, where the patient was closely monitored for sepsis, organ function, and wound healing.

Keywords: Fournier's gangrene, retroperitoneal, necrosis, crepitus, perineal

INTRODUCTION

Fournier's gangrene (FG) is a rare, life-threatening necrotizing fasciitis of the perineal, genital, or perianal regions. It is characterized by rapid progression of infection, tissue necrosis, and systemic toxicity in the body[1]. First described by Jean-Alfred Fournier in 1883, this condition typically affects males aged 50–60 years, with predisposing factors such as diabetes mellitus, alcoholism, immunosuppression, and obesity[2]. The infection is mostly polymicrobial, involving both aerobic and anaerobic organisms, and can spread along the fascial planes of the body, leading to extensive tissue destruction[3].

Retroperitoneal extension of Fournier's gangrene is an uncommon but severe complication, associated with higher morbidity and mortality due to delayed diagnosis and challenges in surgical management. The retroperitoneal space provides a conduit for the spread of infection, which can lead to sepsis, multi-organ failure, and death if not promptly treated.

This case report describes a 53-year-old male with a history of type 2 diabetes, obesity, and hypertension who presented with Fournier's gangrene and retroperitoneal extension. The report highlights the clinical presentation, diagnostic approach, management, and outcomes, emphasizing the importance of early recognition and aggressive treatment.

CASE PRESENTATION

History and Clinical Examination

A 53-year-old male presented to the emergency department with a 5-day history of severe pain in the perianal region, swelling, and fever. He reported difficulty urinating and had noticed foul-smelling discharge from the perineal region. He has personal history of chronic smoking for 20 years. His medical history was significant for poorly controlled type 2 diabetes mellitus (HbA1c: 9.8%), obesity (BMI: 38 kg/m²), and hypertension. He denied any recent trauma, urinary catheterization, or surgical procedures.

On examination, the patient was febrile (temperature: 39.2°C), tachycardic (heart rate: 88 bpm), and hypotensive (blood pressure: 90/60 mmHg). The perineal region exhibited extensive erythema, edema, and crepitus, with areas of severely formed necrotic tissue and foul smelling purulent discharge. Crepitus extended to the lower abdominal wall and flanks. He also has complaints of involuntary passage of urine, body pain, loose stools for 2 days. Digital rectal examination revealed tenderness and induration in the perirectal area. Systemic examination was notable for signs of sepsis, including tachypnea and altered mental status.

LABORATORY INVESTIGATIONS

Initial laboratory findings were consistent with severe infection and sepsis:

- White blood cell count: 29100/µL (elevated, with neutrophilia)

- Hemoglobin: 13.7 g/dL

- Platelets: 213000/µL

- HbA1c: 11.4%

- C-reactive protein: 220 mg/L (markedly elevated)

- ProBNP: 10300 ng/mL (elevated)

- Serum creatinine: 3.5 mg/dL (acute kidney injury)

- Blood glucose: 318 mg/dL (hyperglycemia)

- Arterial blood gas: pH 7.25

- D-DIMER: 622ng/dl

Imaging Studies

1.Plain X-ray of the Abdomen and Pelvis: Revealed subcutaneous emphysema in the perineal and lower abdominal regions.

2.Contrast-Enhanced CT Scan of the Abdomen and Pelvis: Diffuse hepatic steatosis with right inguinal hernia, necrosis in retroperitoneal extension. There was evidence of fluid collections and fascial thickening, consistent with necrotizing fasciitis.

Diagnosis

Based on the clinical presentation, laboratory findings, and imaging studies, a diagnosis of Fournier's gangrene with retroperitoneal extension was made.

Treatment

Initial Resuscitation and Stabilization

The patient was admitted to the intensive care unit (ICU) for aggressive resuscitation and monitoring. Management included:

- Intravenous fluids (crystalloids) to restore hemodynamic stability.

-Broad-spectrum intravenous antibiotics: INJ MEROPENEM (500mg IV Q8H), INJ DOXYCYCLINE (100mg IV BD), INJ TEICOPLANIN (600mg IV BD*3dose+ OD*Q48H)

- Insulin infusion for glycemic control.

- Vasopressors (noradrenaline) for septic shock.

Surgical Intervention

Emergency surgical debridement was performed within 6 hours of admission. The procedure involved:

- Extensive debridement of necrotic tissue in the perineum, scrotum, and lower abdominal wall.

- Exploration of the retroperitoneal space, with drainage of abscesses and removal of necrotic tissue.

- Placement of vacuum-assisted closure (VAC) devices to promote wound healing.

The patient required multiple debridements over the next 7 days due to the progressive nature of the infection.

Adjuvant Therapies

- Hyperbaric oxygen therapy (HBOT) was initiated postoperatively to enhance tissue oxygenation and reduce bacterial load.

- Nutritional support with enteral feeding to address catabolic state and promote wound healing.

- Renal replacement therapy for acute kidney injury.

Postoperative Course

The patient remained in the ICU for 1 week. Gradual improvement in wound healing and systemic infection was observed, and he was transitioned to a surgical ward for further care.

DISCUSSION

Pathophysiology and Risk Factors

Fournier's gangrene is a synergistic infection caused by aerobic and anaerobic bacteria, including Escherichia coli, Klebsiella pneumoniae, Streptococcus species, and Bacteroides fragilis. The infection typically originates from the genitourinary tract, gastrointestinal tract, or skin, and spreads along fascial planes. Diabetes mellitus, as seen in this patient, is a major risk factor due to impaired immunity and microvascular disease. Obesity and hypertension further contribute to poor wound healing and increased infection risk.

Retroperitoneal extension occurs when the infection spreads along fascial planes into the retroperitoneal space, a potential space that allows rapid dissemination. This complication is associated with higher mortality due to delayed diagnosis and challenges in surgical management.

Diagnostic Challenges

Early diagnosis of Fournier's gangrene is critical for improving outcomes. Clinical features such as pain, swelling, crepitus, and systemic toxicity should raise suspicion. Imaging studies, particularly CT scans, play a crucial role in confirming the diagnosis and assessing the extent of disease. In this case, the CT scan was instrumental in identifying retroperitoneal extension, which guided surgical planning.

Management Principles

The management of Fournier's gangrene involves a multidisciplinary approach, including:

1. Aggressive Resuscitation: To address septic shock and organ dysfunction.

2. Broad-Spectrum Antibiotics: To cover polymicrobial infection.

3. Surgical Debridement: The cornerstone of treatment, involving removal of all necrotic tissue.

4. Adjuvant Therapies: HBOT and nutritional support to enhance healing.

5. Complication Management: Addressing sepsis-related complications such as acute kidney injury and coagulopathy.

Prognosis

The mortality rate for Fournier's gangrene ranges from 20% to 40%, with higher rates in cases involving retroperitoneal extension. Poor prognostic factors include delayed presentation, advanced age, comorbidities (e.g., diabetes, obesity), and the development of sepsis or multi-organ failure.

CONCLUSION

Fournier's gangrene with retroperitoneal extension is a severe and potentially fatal condition that requires prompt recognition and aggressive management. This case highlights the importance of a high index of suspicion in patients with risk factors such as diabetes, obesity, and hypertension. Early surgical intervention, broad-spectrum antibiotics, and multidisciplinary care are essential for improving outcomes. Despite advances in management, the mortality rate remains high, underscoring the need for further research into novel therapies and preventive strategies.

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