

FOURNIER'S GANGRENE AS PANIC EVENT IN AN ONCOLOGICAL STAGING FDG PET/CT: HOLIER THAN THOU

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ABSTRACT

Fournier's gangrene is a rare and rapidly progressive form of necrotizing fasciitis that affects the deep and superficial tissues of the perineal, genital, anal and scrotal regions. It primarily results from polymicrobial infection and characterized by severe inflammation and infection spreading along fascial planes, often leading to rapid tissue destruction, sepsis, and a high mortality rate of 40%. Initial symptoms may mimic benign conditions such as cellulitis; therefore, early diagnosis is crucial to minimize morbidity and avoiding mortality. As one of the few urological emergencies, this condition requires prompt surgical debridement, antibiotic therapy, and medical resuscitation for effective management. We are presenting a case of elderly diabetic woman with a short history of significant morbidity with recent biopsy proven Squamous Cell carcinoma (SCC) of anterior mediastinal mass. As part of initial staging, she had FDG PET/CT which revealed nodal and pulmonary metastasis (Stage IV disease). However, PET/CT also revealed Fournier's gangrene with imaging findings favoring septicemia and considering it a medical emergency, primary physician was immediately informed (as panic event). Early diagnosis of Fournier's gangrene can be challenging, as 40% of patients may have no symptoms, and up to 75% of cases are initially misdiagnosed, contributing to its persistently high mortality rate. This review will focus on role of imaging in Fournier's gangrene.

Keywords: Fournier's gangrene; FDG; PET/CT; CT; MRI; panic event

Case Presentation

71-year-old lady, with long standing diabetes (on oral hypoglycemic) presented with short history of low-grade fever and significant dyspnea, anemia, raised total leucocytes (neutrophilia) and X-ray chest showed left side pleural effusion. Contrast enhanced CT (CECT) showed a large anterior mediastinal mass, enlarged left axillary nodes, left side moderate pleural and mild pericardial effusion, bilateral lung nodules with radiological diagnosis of lymphoma. CT guided biopsy

of mediastinal mass revealed SCC while left axillary node biopsy was negative for malignancy. For staging work-up she underwent FDG PET/CT without intravenous contrast. FDG PET/CT redemonstrated hypermetabolic anterior mediastinal mass with areas of necrosis, large left sided pleural effusion, gross pericardial effusion and multiple hypermetabolic bilateral lungs nodules (Fig.1). Spleen, marrow and both adrenal show mild diffuse FDG uptake of likely reactive in nature.

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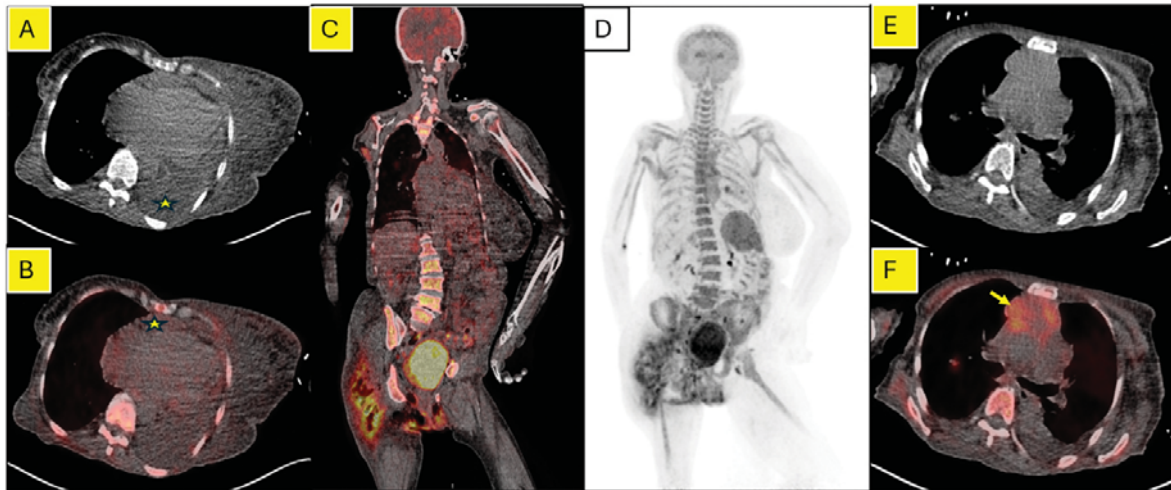


Figure 1 (A-F): FDG PET/CT study. **A** (CT axial) and **B** (fused axial) showing pericardial and left pleural effusion (yellow asterisk); **C** (fused coronal) image showing hypermetabolic emphysematous lesion in right gluteal and vulva; **D** (maximum intensity image MIP) showing generalized enhanced uptake in marrow and spleen (indicators of septicemia); **E** (CT axial) and **F** (fused axial) showing biopsy proven Squamous Cell Ca. of anterior mediastinal mass (yellow arrow).

There was evidence of FDG avid severe subcutaneous infection with gross emphysema involving perineum, vulva and both gluteal regions (more on right) consistent with Fournier's gangrene. There were moderate FDG

avid bilateral pelvic and inguinal nodes (likely infective) (Fig.2). Scan findings were communicated to primary team and patient was admitted but unfortunately died in ICU after 48 hours.

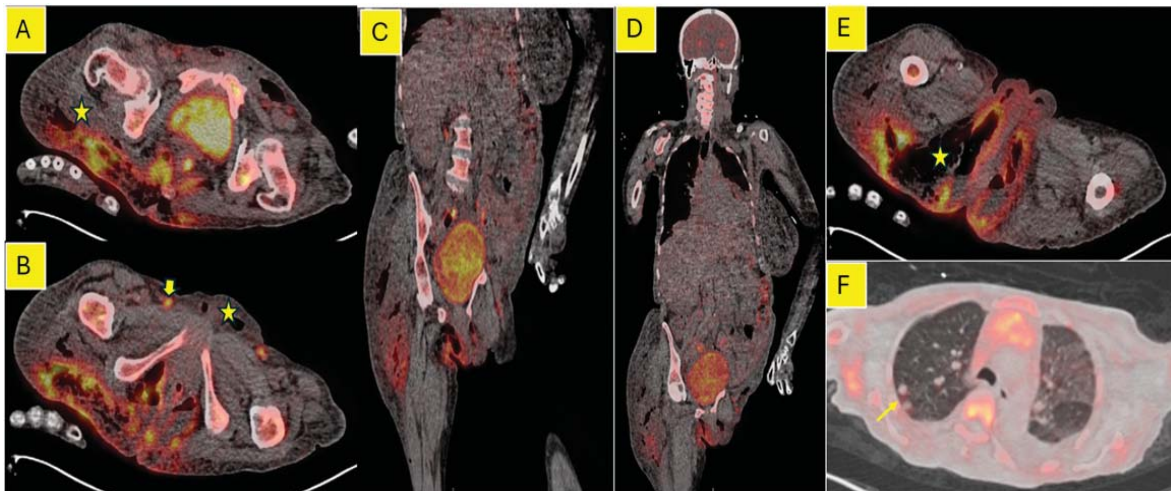


Figure 2 (A-F): FDG PET/CT study. **A** (fused axial) showing hypermetabolic Fournier's gangrene with emphysema (asterisk); **B** (fused axial) showing hypermetabolic subcentimeter bilateral inguinal nodes (arrow, likely reactive) and emphysema in vulva (asterisk); **C & D** (fused coronal at different levels) images showing hypermetabolic emphysematous area in right gluteal region and body wall edema; **E** (fused axial) showing hypermetabolic emphysematous process involving soft tissue planes in right gluteal and perineal regions (asterisk); **F** (fused axial) showing soft tissue pulmonary nodules in right upper lobe suggestive of metastasis (arrow).

Discussion

Fournier's gangrene (named after Dr Alfred Fournier, a French dermatology and venereal specialist in 1883) is

a rare, life-threatening, and rapidly progressive form of necrotizing fasciitis (flesh-eating disease) affecting the

perineal, genital and perianal regions. It is a true urological emergency due to the high mortality rate but fortunately, the condition is rare. It requires immediate surgical debridement and broad-spectrum antibiotics but often leads to a 40% mortality rate due to septicemia.² Early diagnosis of Fournier's gangrene can be challenging, as 40% of patients may have no symptoms, and up to 75% of cases are initially misdiagnosed, contributing to its persistently high mortality rate.³ Fournier's gangrene is typically seen in men with diabetes mellitus (approximately 50%), aged 50-70 years but can also occur in healthy individuals albeit less commonly (26-30%).² Although historically women were rarely affected, the incidence appears to be increasing and is particularly associated with morbid obesity. Other predisposing factors include chronic renal and / or liver failure, immunocompromised, HIV, alcohol, etc. Source of infection is most commonly anorectal and less commonly secondary to trauma to genitourinary or perineal region. It is usually a polymicrobial infection (both aerobic and anerobic) like E.coli, Klebsiella, Proteus, Staphylococcus, and Streptococcus.⁴ It begins with cellulitis triggering obliterative endarteritis and thrombosis of subcutaneous vessels. This leads to necrotizing infection that spreads through the fascial planes. Initially, this is localized to perianal and perineal regions but later extension to the thighs and anterior abdominal wall. Importantly the testes are usually spared due to their different arterial supply from the aorta. The culprit organisms often produce gas and causing subcutaneous emphysema with rapid spread (up to 2-3 cm/hour).⁵

Patients with Fournier's gangrene typically present with pain in the perineal or genital areas. Early signs may be minimal or subtle, with symptoms intensifying as the condition progresses. Clinicians should remain suspicious of any infection or cellulitis in the perineal or scrotal regions, particularly if the pain is disproportionate to the visible lesion.

The diagnosis of Fournier's gangrene is primarily clinical but can be supported by a combination of hematological work and imaging. Clinicians should maintain a high index of suspicion for any inflammatory or infectious process involving the perineum or genitalia, especially in older male patients with diabetics and other patients at increased risk. Patients usually have raised white blood cell count (with left shift), deranged electrolytes like hyponatremia and raised serum creatinine, lactate,

C-reactive protein (CRP), and procalcitonin can help assess associated bacteremia and sepsis. While Fournier's gangrene is primarily a clinical diagnosis, imaging can help to confirm the disease process and assess the extent of involvement. However, imaging alone cannot establish or rule out the diagnosis of Fournier's gangrene and should not delay surgical intervention, especially in hemodynamically unstable patients. The role of imaging, most commonly employing CT, includes establishing diagnosis, to determine the extent and underlying cause of disease.

Ultrasound Imaging

Ultrasound imaging is quick and widely available modality which is valuable for visualizing subcutaneous gas or emphysema in the underlying soft tissue. This imaging technique may also reveal thickened scrotal walls with linear hypoechoic fluid streaks and increased blood flow. The presence of gas in the scrotum is considered a pathognomonic sign of Fournier's gangrene.⁶ Presence of air in subcutaneous fat gives findings like "cobble stoning" (subcutaneous fat globules surrounded by fluid), the "snow globe" effect (a swirling appearance of heterogeneous subcutaneous material), and "dirty shadowing" (a hazy appearance of infected subcutaneous tissue caused by gas shadowing and reverberation artifacts from hyperechoic foci).⁶

X-Ray Imaging

Standard X-rays can detect gas in soft tissue or emphysema, typically following fascial planes, and may be visible before crepitus is detected on physical examination.⁷ While the presence of subcutaneous emphysema is helpful, a negative x-ray should not rule out a diagnosis of Fournier's gangrene.⁷

Computed Tomography Imaging

CT is the most sensitive (88.5%) and specific (93.3%) imaging modality for diagnosing Fournier gangrene.⁸ Characteristic findings include fat stranding around affected structures, subcutaneous emphysema, abscess formation, asymmetrical fascial thickening, and abnormal fluid collections.⁹ CT scan is also recommended after surgery to identify new pockets of infection and assess wound healing.

Magnetic Resonance Imaging Scans

Although Magnetic Resonance Imaging (MRI) is the

modality of choice for soft-tissue pathology because of better contrast, due to high cost and longer imaging time, it is not recommended for the initial diagnosis of suspected Fournier gangrene.¹⁰ However, for better assessment of extent of Fournier's Gangrene, MRI is considered the gold standard imaging.¹¹ Characteristic MRI findings include subcutaneous emphysema (signal void), thickened fascia, extensive phlegmon/fat stranding, and fluid collections.

FDG PET/CT Imaging:

PET/CT being a hybrid modality, typically demonstrates intense, heterogeneous metabolic activity (FDG uptake) in the perineal, perianal, or scrotal regions, corresponding to active inflammation.¹² While CECT is the primary modality for diagnosing Fournier's gangrene, FDG PET/CT can detect infection patients with insidious presentation.¹³ FDG PET/CT delineates accurately metabolic activity of the infected soft tissues, including subcutaneous emphysema and fascial involvement, sometimes providing better evaluation of the infection spread than CT alone. Importantly, FDG PET/CT is useful for assessing the efficacy of therapy (debridement/antibiotics) and monitoring for residual infection. Fournier's Gangrene is a rare and rapidly progressive form of necrotizing fasciitis, a medical emergency with high morbidity and mortality if untreated. Imaging plays an important role in diagnosis and follow-up to assess the treatment response. Immunocompromised patients may have an insidious presentation, but FDG PET/CT performed during treatment course can easily diagnose the condition. Considering Fournier's gangrene, a urological emergency with high morbidity and mortality, it is imperative for nuclear medicine team to inform the referring physician immediately as a panic event.

CONFLICT OF INTEREST: None

References

1. Carroll PR, Cattolica EV, Turzan CW, McAninch JW. Necrotizing soft-tissue infections of the perineum and genitalia. Etiology and early reconstruction. *West J Med.* Feb 1986; **144(2)**: 174-8.
2. Joury A, Mahendra A, Alshehri M, Downing A. Extensive necrotizing fasciitis from Fournier's gangrene. *Urol Case Rep.* Sep 2019; **26**: 100943.
3. Singh A, Ahmed K, Aydin A, Khan MS, Dasgupta P. Fournier's gangrene. A clinical review. *Arch Ital Urol Androl.* Oct 2016; **88(3)**: 157-64.
4. Auerbach J, Bornstein K, Ramzy M, Cabrera J, Montrief T, Long B. Fournier Gangrene in the Emergency Department: Diagnostic Dilemmas, Treatments and Current Perspectives. *Open Access Emerg Med.* 2020; **12**: 353-64.
5. Thayer J, Mailey BA. Two-stage Neoscrotum Reconstruction Using Porcine Bladder Extracellular Matrix after Fournier's Gangrene. *Plast Reconstr Surg Glob Open.* Aug 2020; **8(8)**: e3034.
6. Di Serafino M, Gullotto C, Gregorini C, Nocentini C. A clinical case of Fournier's gangrene: imaging ultrasound. *J Ultrasound.* Dec 2014; **17(4)**: 303-6.
7. Auerbach J, Bornstein K, Ramzy M, Cabrera J, Montrief T, Long B. Fournier Gangrene in the Emergency Department: Diagnostic Dilemmas, Treatments and Current Perspectives. *Open Access Emerg Med.* 2020; **12**: 353-64.
8. Fernando SM, Tran A, Cheng W, Rochweg B, Kyeremanteng K, Seely AJE, et al. Necrotizing Soft Tissue Infection: Diagnostic Accuracy of Physical Examination, Imaging, and LRINEC Score: A Systematic Review and Meta-Analysis. *Ann Surg.* Jan 2019; **269(1)**: 58-65.
9. Piedra T, Ruiz E, González FJ, Arnaiz J, Lastra P, López-Rasines G. Fournier's gangrene: a radiologic emergency. *Abdom Imaging.* Jul-Aug 2006; **31(4)**: 500-2.
10. Ballard DH, Mazaheri P, Raptis CA, Lubner MG, Menias CO, Pickhardt PJ, et al. Fournier Gangrene in Men and Women: Appearance on CT, Ultrasound, and MRI and What the Surgeon Wants to Know. *Can Assoc Radiol J.* Feb 2020; **71(1)**: 30-9.
11. Kochkine S, Payne DL, Chung K, Chen D, Bernstein MP, Baxter AB, et al. Imaging of necrotizing fasciitis.

Clin Imaging. Dec 2024; **116**: 110331.

12. Hsu CT, Kao PF, Huang CC, Huang HH, Lee JK. FDG PET/CT images demonstrating Fournier gangrene with bilateral pelvic muscle extension in a patient with recurrent rectosigmoid cancer. Clin Nucl Med. Jan 2014; **39(1)**: 52-3.
13. Moreno-Ballesteros A, González-Cámpora R, Navarro-Vázquez S, Arce-Durán J, González-Gaggero B. Unexpected Fournier's gangrene diagnosed by 18F-FDG PET/CT in a patient with metastatic lung adenocarcinoma. Rev Esp Med Nucl Imagen Mol (Engl Ed). Jul-Aug 2023; **42(4)**: 276-7.