

Fournier's gangrene: ultrasonographic findings. Case report

Gangrena de Fournier: hallazgos por ecografía. Presentación de caso

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Summary

Fournier's gangrene represents a necrotizing fasciitis of polymicrobial etiology. It has been described as an extension of a primary infectious focus of adjacent structures in the perineal, perianal and genital region. This pathology presents a rapid progression and a high mortality rate, so its early diagnosis is essential in the approach. We present the case of a patient with Fournier's gangrene who was diagnosed based on ultrasound findings and treated surgically with a favorable outcome.

Resumen

La gangrena de Fournier es una fascitis necrosante de etiología polimicrobiana. Se ha descrito como la extensión de un foco infeccioso primario de estructuras adyacentes, en las regiones perineal, perianal y genital. Esta patología tiene una rápida progresión y alta tasa de mortalidad, por lo que su diagnóstico precoz es fundamental. Se presenta el caso de un paciente con gangrena de Fournier que fue diagnosticado a partir de hallazgos ecográficos y abordado quirúrgicamente con un desenlace favorable.

Introduction

Fournier's gangrene is a necrotizing fasciitis of polymicrobial etiology, secondary to the extension of a focus of infection in adjacent structures of the perineal, perianal and genital region (1). Predisposing factors include diabetes, chronic alcohol use and immunosuppression (2).

Given its rapid progression (2-3 cm/hour) and the high mortality rates reported (7-50 %) it is considered a urological emergency and, therefore, its diagnosis in early stages is fundamental (1, 3). Immediate ultrasonography is proposed as a useful strategy for decision making (1).

We describe the case of a patient in an early stage of the disease in whom the sum of clinical and ultrasonographic timely diagnosis and treatment.

Presentation of the case

This is a 53-year-old patient with a history of type 2 diabetes mellitus, poor metabolic control and poor adherence to medication. He was admitted to the emergency department due to inflammatory changes in the perineal region and scrotum of ten days of evolution, predominantly right, with drainage of purulent material to the ipsilateral perineal region. On physical examination he was found with acute abdominal pain, prominent scrotal inflammatory changes and edema in

the right hemiscrotal; he had a nodular lesion with an exit orifice towards the right gluteal groove and spontaneous drainage of purulent fetid secretion, probably related to perianal abscess. With these findings, the extension of the inflammatory involvement was suspected.

Laboratory tests showed leukocytosis (22,400) at the expense of neutrophils (85 %), elevated C-reactive protein (102) in relation to active inflammatory process. Based on the clinical findings and their paraclinical correlation it was decided to perform a Doppler ultrasound, in which marked inflammatory changes were evidenced in the scrotal region evaluated; the indemnity of both testicles, which preserved their usual shape, size and echogenicity (Figures 1 and 2).

We also observed scarce bilateral hydrocele and, as the main finding, focal echogenic lesions of linear shape that produced posterior "dirty shadow" related to gas in the scrotum, ultrasound findings highly suggestive of Fournier's gangrene (Figure 3).

Subsequently, it was decided to perform a simple abdominopelvic computed tomography (CT) scan. The only relevant finding was: multiple bilateral inguinal adenopathies of reactive aspect (figure 4). It was decided to take the patient for surgical intervention by the Urology Department. The drainage of approximately 100 cm³ of purulent and fetid material was achieved, with the finding of necrosis in 70 % of the skin, for which extensive tissue resection was performed.

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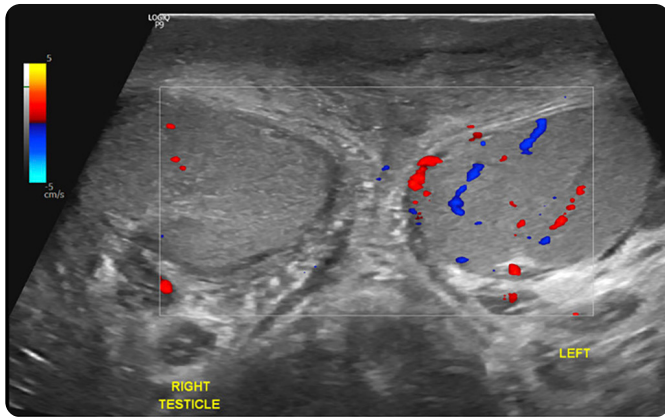


Figure 1. Testicular ultrasound with Doppler analysis: indemnity of both testicles, with usual morphology and vascularity.

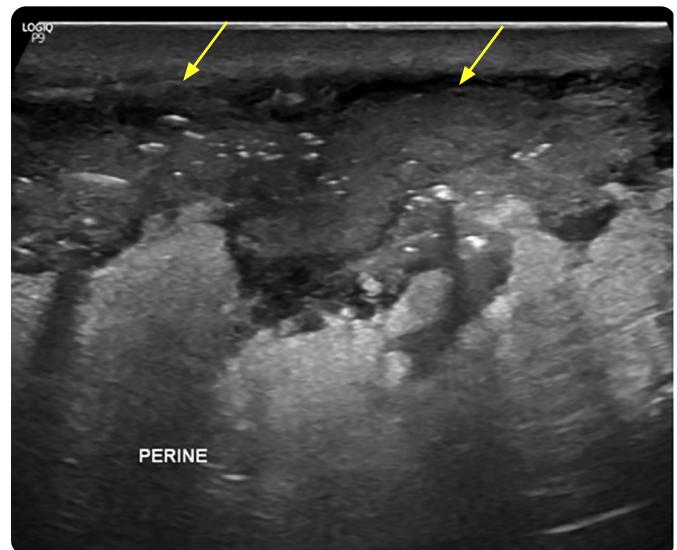


Figure 2. Gray scale testicular ultrasound: marked inflammatory changes (yellow arrows) towards the perineal region under study.

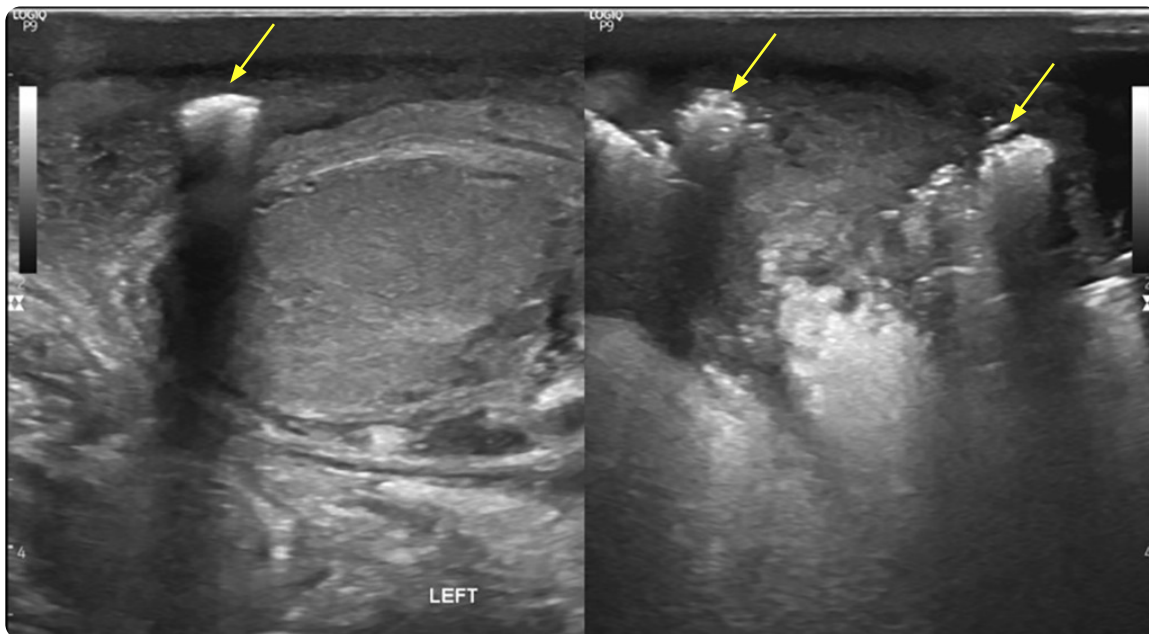


Figure 3. Gray scale testicular ultrasound: multiple echogenic images in the perineum, with posterior dirty shadow, suggestive of gas (yellow arrows).



Figure 4. Simple abdominopelvic CT: multiple bilateral inguinofemoral adenopathies of reactive aspect (asterisks).

A perineal fistula in probable communication with the anal canal was also observed. After surgery, the patient received antibiotic treatment with vancomycin and piperacillin tazobactam for 14 days, and enterostomal therapy. The patient's clinical condition improved. The culture of the perineal secretion was negative and the cures were continued with projection to a future plastic surgery intervention for scrotal closure with flaps.

Discussion

Fournier's gangrene is a form of necrotizing fasciitis located in the perineal, perianal and genital regions, initially described as an idiopathic process in 1883. It mainly affects the male genitalia, although it has also been reported in women and children. It is considered a relatively infrequent entity, with an estimated maximum incidence of 1.6 cases per 100,000 men, which accounts for the low exposure in clinical practice (4). Currently, its polymicrobial etiology secondary to an infectious process of adjacent structures has been documented. Cases have been described in which up to four microorganisms have been isolated per lesion, usually corresponding to the flora of the urogenital and anorectal regions. These microorganisms are of low virulence, therefore, it is considered that there must be a predisposition due to some compromise of the immune system. Additional risk factors have been reported, such as diabetes mellitus, alcoholism, HIV infection, renal insufficiency, among others (1). The patient reported in

this article had obesity and insulin-dependent type 2 diabetes mellitus with poor metabolic control, and this is the comorbidity that prevails in these patients. Regarding the infectious focus, the patient had a perineal abscess associated with a fistulous tract, which is considered one of the most common foci of origin of Fournier's gangrene.

Although the clinical picture of the entity has multiple findings that facilitate the diagnosis in advanced stages, initially the manifestations are subtle and insidious, given by genital itching, edema and erythema of external genitalia, pain and fever, which may hinder the complexity of the diagnosis (1, 5). In this scenario, ultrasound is established as the most cost-effective diagnostic tool (sensitivity 88 %, specificity 93 %) if Fournier's gangrene is suspected, with which the definitive diagnosis is achieved with the set of characteristic findings that should be looked for and described in the study report (Table 1) (1, 5, 6). In the case described here, the findings reported in the literature were observed, which contributed to the clinical diagnosis of this entity and facilitated its timely management.

Box 1. Ultrasound findings that should be included in the report

- Edematous and thickened scrotal wall
- Uni or bilateral hydrocele
- Hyperechoic foci with reverberation and posterior "dirty shadow" (intralesional gas).
- Indemnity of testicles and epididymides, in size, shape and echogenicity

The diagnostic effectiveness of ultrasound in this context lies in its ability to identify subcutaneous air, above plain radiography, as well as the ease of performance at the patient's bedside; in addition, radiation, contrast medium administration and patient transfer are avoided (1). Although magnetic resonance imaging (MRI) is excellent for characterizing soft tissues, it is not recommended as an initial study due to its high cost, low availability and prolonged examination time. The best diagnostic modality for both identification and differential diagnosis is CT (sensitivity 88.5 %, specificity 93.3 %). The prevalent findings to look for and include in the report are free fluid, heterogeneous collections, asymmetric thickening of the fasciae, fat rarefaction, inguinal adenopathies and subcutaneous emphysema (7). Any pathologic process with the presence of gas and/or inflammation of fascial planes around the genitalia associated with acute pain will be included in the differential diagnoses of Fournier's gangrene. Fortunately, in most cases, an adequate anamnesis and initial ultrasound allow excluding the most important differential diagnoses (Table 1) (2, 8).

Table 1. Ultrasonographic differential diagnoses in Fournier's gangrene

Incarcerated inguinal hernia	Presence of gas in the scrotum, however, confined within the intestinal lumen with visible peristalsis; long-standing history of inguinoscrotal mass sensation.
Testicular torsion	Acute scrotal pain, may present gas in relation to necrotic process; however, it would be intrascrotal and associated with altered testicular echogenicity and increased Doppler flow.
Orchitis and epididymitis	Acute scrotal pain, with inflammatory changes of testis and/or epididymis associated with color Doppler hyperemia.
Squamous cell carcinoma	May arise from or generate an ulcerative lesion; very important anamnesis: chronicity, presence of gas more common in penis and labia majora, less common in scrotum.

Early diagnosis and timely surgical debridement are the most important factors in determining patient survival, as well as the initiation of timely antibiotic treatment (3).

Conclusion

Fournier's gangrene is a clinical entity with a rapid progression and high risk of death, therefore, the tools that allow adding arguments in a reliable and early manner are fundamental in its approach. Ultrasonography is the most cost-effective imaging tool in this scenario, since it represents an easily accessible and rapidly interpreted modality, and preserves diagnostic specificity.

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