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Case Report

Perforated appendicitis as a source of Fournier's gangrene in an immunocompetent male

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ABSTRACT

Fournier's gangrene is a synergetic polymicrobial necrotizing fasciitis of the perianal, perineal and genital areas, it is a rare condition and it has a high mortality rate of up to 67%. Acute appendicitis has been identified as another cause of Fournier's gangrene. This case demonstrates the critical importance of considering a diagnosis of Fournier's gangrene because of a missing diagnosis of appendicitis even if the patient is young, healthy, immunocompetent and without a background of abdominal pain. We discuss a case of 35-year-old male, immunocompetent and medically free, who was presented to Emergency Department with a clinical picture of Fournier's gangrene due to acute perforated appendicitis without a history of abdominal pain, and within 48 hours of the onset of bilateral scrotal swelling. Our case demonstrates the importance of considering Fournier's gangrene as a complication of an intra-abdominal septic process, even in a young, healthy, immunocompetent patient.

Keywords: Appendicitis, Fournier's gangrene, Polymicrobial necrotizing fasciitis

INTRODUCTION

Fournier's gangrene was first time reported by French venereologist Jean Alfred Fournier in 1883. It is identified as a polymicrobial necrotizing fasciitis of the perineal, perianal, or genital area. It is considering an emergency condition which is typically seen in elderly, diabetic, immunocompromised patients. It is a rare condition that can occur in both males and females with a male preponderance of 10:1. It is potentially life-threatening despite aggressive surgical and medical management. Fournier gangrene has a high mortality rate of up to 67% with an incidence of 1:7500-1:750,000.[1] It is usually caused by poly microbial but mainly by bacteria that survives without oxygen (anaerobes) such as Group A *Streptococcus*, *Staphylococcus aureus*, *Clostridium perfringens*.

By early recognition of the disease and its underlying cause, a favorable outcome can be achieved. Anorectal, genitourinary, and cutaneous sources of infection are the most common causes of Fournier's gangrene, with diabetes mellitus being the most common risk factor.[1] There is a higher incidence in elderly and immunocompromised patients and usually associated with a history of trauma, urinary tract infection or perirectal infection. Acute appendicitis has been identified as another cause of Fournier's gangrene and it is rare of rare pathology were will be presented in our study.

CASE REPORT

A 35 year old Ethiopian male, not known to have any chronic medical co-morbidities, presented to the emergency department, complaining of scrotal pain and swelling for two days, associated with urinary retention, rigors, and fever, no history of surgical interventions recently or similar episodes before. On physical examination he was pale, sick looking, dehydrated, tachycardic 132 bpm, hypotensive 83/41 torr, high-grade fever 41 C, the abdomen was soft and lax, no tenderness or palpable masses, intact hernial orifices. The genital exam revealed scrotal swelling and perineal induration and patchy bluish discoloration with foul smelling purulent discharge; the digital rectal exam was negative for any perianal abscess or prostatic tenderness. Laboratory workup showed leukocytosis of 24×10×9/L, Hgb 8.9 g/dL, a picture of acute kidney injury with a creatinine of 312 mmol/L and urea 17mmol/L, arterial ph 7.1, lactic acidosis 4.8 mmol/L. He was resuscitated aggressively with crystalloids and vasopressors, taken immediately to or as a case of Fournier's gangrene for exploration and debridement without further radiological investigations. Upon exploration, it was found that the gangrene extended to the lower abdominal wall, so an exploratory laparotomy, which revealed perforated gangrenous pelvic appendicitis with fecal peritonitis as an abdominal source for Fournier's gangrene. Appendectomy and copious peritoneal lavage and drainage were done and open abdomen and perineal debridement as a damage control procedure were performed. He was transferred to ICU in critical condition on maximal vasopressor support, 4 hours later, unfortunately, the patient arrested and didn't respond to CPR and was declared dead.

DISCUSSION

Fournier's gangrene is a synergetic polymicrobial necrotizing fasciitis of the perianal, perineal and genital areas, which is characterized by obliterative endarteritis of the subcutaneous arteries, resulting in gangrene of the subcutaneous tissue and the overlying skin.[1]

First described by a French dermatologist and venereologist Jean Alfred Fournier in 1884 who described five cases of young males affected by a rapidly progressing fulminant infection of the soft tissues in the perineal and scrotal regions, but there was no identifiable etiology.[2] Although originally considered idiopathic, an underlying cause of the disease can be identified in most patients.[1]

Acute appendicitis has been identified as another cause of Fournier's gangrene, mainly secondary to rupture of the viscus in the retrocecal or retroperitoneal spaces with the subsequent spreading of infection into the perineal and scrotal regions.[3] Fournier's gangrene diagnosis may not be evident initially if the underlying cause is intra-abdominal, resulting in a late presentation and a poorer prognosis.

This case demonstrates the critical importance of considering a diagnosis of Fournier's gangrene because of a missing diagnosis of appendicitis even if the patient is young, healthy, immunocompetent and without a background of abdominal pain.

Moreover, when there is a clinical suspicion of Fournier's gangrene and the underlying cause is unclear, with perirectal and urinary tract infection and trauma causes are not readily apparent, an intra-abdominal source should be considered. A high index of suspicion and immediate surgical management with a multidisciplinary approach are necessary to maximize the chances of a good outcome. Missing such a case could be catastrophic.

In 1991, was the first description of Fournier's gangrene caused by appendicitis, which was a 27 year old man who had a retroperitoneal infection caused by perforated gangrenous retroperitoneal appendicitis spreading to the scrotum via the ductus deferens. Management consisted of surgical debridement and placed several drains. After surgery, hyperbaric oxygen and antibiotic therapy were started. The patient made a full functional recovery and was discharged 50 days after admission.[4]

Two cases of Fournier's gangrene were reported in 1994, caused by intra-abdominal infectious processes (ruptured appendicitis and diverticulitis), which was not immediately evident on the initial evaluation of either patient.

They were managed by immediate debridement of the necrotic tissue, exploratory laparotomy, and diverting colostomy.[5]

Another case of Fournier's gangrene caused by appendicitis was reported in 2002. The patient was admitted due to abdominal pain localized in the right lower flank and generalized sepsis secondary to a perforated retrocecal acute appendicitis which compromised the scrotum and testis. A resection of the right inguinal cord and testis was done. Unfortunately, the outcome was poor, and the patient died due to multiorgan failure.[6]

In 2005, a 68 year old Japanese man diagnosed with Fournier's gangrene, that arose secondary to retroperitoneal soft tissue infection resulting from perforated gangrenous appendicitis. The patient was admitted with perforated ascending colon diverticulitis. Preoperatively, he was diagnosed as having an acute perforated appendicitis with panperitonitis. The operative findings showed perforated gangrenous appendicitis with a retroperitoneal abscess. On the second postoperative day, he complained of pain and swelling in his right scrotum, which was diagnosed as Fournier's gangrene

caused by acute appendicitis. On the fourth postoperative day, he was managed by debridement and drainage.[7]

A case of a 78 year old patient with bilateral Fournier's gangrene due to acute appendicitis with retroperitoneal perforation and an enterocutaneous fistula of the cecum was reported in 2006. He was managed by vacuum-assisted closure therapy in surgery, which eventually ended with a quick and safe treatment of infection and healing.[8]

The first reported case of Fournier's gangrene secondary to a herniated inflamed appendix into the inguinal canal (Amyand's inguinal hernia) was in 2015. A 68 year old man hemodynamically collapsed on arrival to the hospital, who presented with severe pain and extensive purple discoloration from the right iliac fossa to the perineum. The patient was resuscitated with intravenous fluids, and broad-spectrum antibiotics were initiated. Laparotomy was performed which revealed a grossly inflamed appendix herniating into the inguinal canal with an ischemic caecum. Surgical debridement, drainage of necrotic fluid, and right hemicolectomy were performed. Unfortunately, the patient went into cardiac arrest and passed away on the operating table. Histological analysis showed acute-on-chronic inflammation involving the appendix. The condition where appendicitis is implicated in Fournier's gangrene is usually due to retroperitoneal rupture and tracking into the perineal spaces.[9]

Another case of Fournier's gangrene complicating perforated appendix in an inguinal hernia (Amyand's inguinal hernia) was reported in 2016. A 47 year old mentally impaired Chinese man came with four days history of lower abdominal pain and pus discharge from his right inguinoscrotal area. He was diagnosed with Fournier's gangrene. The patient was managed by a right orchiectomy with excision of the cord structures and debridement of tissues. On the second postoperative day, he had an excellent recovery, and the drain was removed. He was discharged home with negative pressure wound dressing.[10]

Fournier's gangrene can also affect young immunocompetent patients. In 2016, a case was reported of a 28 year old man admitted to urology department through the emergency department with an atypical history of acute scrotal swelling on a background of abdominal pain which was within 24 hour acute, rapidly progressing bilateral scrotal swelling, pain, and erythema. He was mildly tachycardic but normotensive. There were right iliac fossa and right renal angle tenderness with signs of peritonism. An abdomino-pelvic CT scan showed multi-loculated collections in the right iliac fossa, suggesting perforated appendicitis with the secondary extension of gas down the spermatic cord into the scrotum. The patient was diagnosed with perforated appendicitis and Fournier's gangrene. The patient underwent an urgent laparotomy. Drainage was performed and antibiotics were commenced. Post-operatively patient was admitted to the intensive care unit (ICU). On the fourth postoperative day, the patient was successfully extubated and discharged from ICU and general surgical care. Fortunately, he made a functional recovery, and after two weeks, he was discharged home.[11]

Appendicitis can cause Fournier's gangrene even in children. In 1994, a 10 year old boy in septic shock due to perforation of the appendix went for an emergency laparotomy for appendectomy followed by drainage and antibiotic therapy.

On the second postoperative day, there were signs of increasing redness and edema around the scrotum which became more severe, that raised a strong suspicion of Fournier's gangrene. Emergency surgical debridement of the necrotic scrotal tissue was performed under general anesthesia. Following this operation, the patient improved and weaned from ventilatory assist. On the 6th postoperative day, the patient discharged from the ICU to the ward without any complications.[11]

CONCLUSION

Our case demonstrates the importance of considering Fournier's gangrene as a complication of an intra-abdominal septic process, even in a young, healthy, immunocompetent patient, even in the absence of abdominal pain, especially in rapidly deteriorating patients and to initiate an aggressive medical and surgical resuscitation and source control to achieve acceptable outcomes.

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