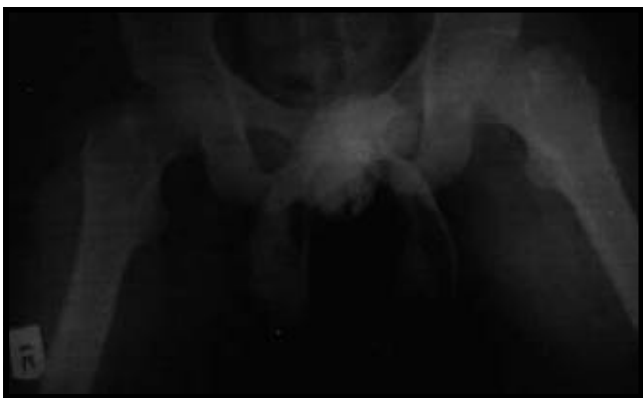


## Necrotizing fasciitis

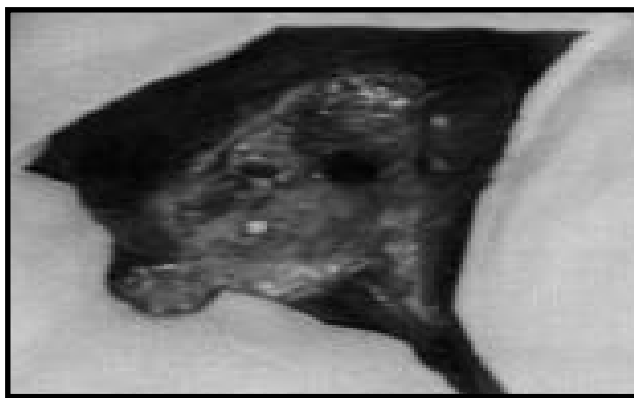
Sir,

I read with interest the review of Dr. Cherneski and Dr. Embil on necrotizing fasciitis.<sup>1</sup> This update review on the flesh-eating disease is informative and a mention of Fournier's gangrene<sup>2</sup> would have made it comprehensive. Some authors ignore the eponym because it may perhaps be unmerited. However, stating that the condition has been known for several years, gives an impression of novelty. There might be recent renewal of interest and a catching new media name but the condition was reported over 230 years ago. Alfred Fournier<sup>3</sup> gave the condition its popular eponymous name in 1883. Baurienne<sup>4</sup> first reported it in 1764. Meloney<sup>5</sup> reported the gangrene affecting other areas of skin and its differential diagnosis. Fournier's gangrene is necrotizing fasciitis of the scrotum that has a unique importance as it may erode the skin and subcutaneous tissues of perineum, penis and lower abdomen.<sup>2</sup> It is relatively more common and frequently reported than any other affected skin area. The same polymicrobial synergistic bacterial gas-producing organisms cause it, and it is different from gas gangrene, other streptococcus pyogenes and dermatitis conditions. Most patients do not have systemic illness or immunodeficiency disorder. Although the source of infection may never be found, most authors agree that it is rarely truly idiopathic.<sup>2</sup> The source of infection may be either urological (45%), anorectal (33%) or cutaneous (21%).<sup>6</sup> It may occur de novo or initiated by any minor surgery on the anus, genitalia or groin in young healthy males.<sup>2</sup> The deep fascia and muscles are spared. The testes are also usually spared due to isolated blood supply

and are protected by tunica albuginea and vaginalis, but this rule is broken if tunica is opened or the source of infection is epididymo-orchitis. This has medico-legal importance. Scrotal necrotizing fasciitis initially presents with acute painful scrotal swelling with over-stretched shiny skin due to gas formation. Necrotic spots become islands of skin gangrene that spread rapidly. There is a special differential diagnosis list to consider such as infected postoperative scrotal hematoma for which ultrasound (US) is helpful. An unusual case that mimicked the initial presentation of Fournier's gangrene affected a young man who developed large scrotal swelling after anal fistula repair. The scrotal sac was inflated with gas that masked its contents on US examination. A plain x-ray affirmed the diagnosis of scrotal pneumatocele (**Figure 1**). Air was injected during surgery for anal fistulae identification. The condition resolved spontaneously without gangrene formation under adequate antibiotic cover and careful observation. Scrotal necrotizing fasciitis may spread rapidly and become fatal unless adequate antibiotic therapy and aggressive surgical excision are implemented promptly. This is the primary life-saving therapy for the condition and any other therapy is supportive. Adjuvant therapies such as hyperbaric oxygen, when available, are helpful in speeding up recovery by reducing the spread of gangrene, the extent of skin loss, the need for skin grafting and hospital stay. A patient presented with necrotizing fasciitis causing necrosis of half scrotal skin, underwent therapy using hyperbaric oxygen after surgical debridement (**Figure 2**). This allowed rapid clean healing of the wound, limited the spread of gangrene and reduced the size of the wound area (**Figure 3**). It also allowed secondary suture of



**Figure 1** - A plain x-ray of scrotum demonstrates pneumatocele. Mimicking early Fournier's gangrene. The large painful scrotal swelling was discovered the morning after anal fistula repair in a 25-year-old Saudi patient. The over stretched scrotal skin was shiny and pale with crepitation. Air was injected for fistula identification.



**Figure 2** - Shows the defect of scrotal skin after surgical debridement of Fournier's gangrene. Other areas of necrotic skin were excised later. It belonged to a 23-year-old patient who presented with acute scrotal swelling after 2 weeks of severe ano-rectal pain. The over stretched scrotal skin was typically shiny with necrotic areas and crepitation.



**Figure 3** - Shows the scrotal ulcer defect of the patient shown in (Figure 2) after 2 weeks of hyperbaric oxygen therapy. Secondary skin suture was feasible which completely covered the spared testes allowing full recovery and early discharge from the hospital.

scrotal skin that covered the testes adequately without graft. The patient was discharged well from the hospital after less than 3 weeks, which is half the usual period when such a patient survives. The authors<sup>1</sup> listed, in Table 1, renal failure and respiratory distress syndrome among the criteria of toxic shock syndrome. No doubt, such features and mortalities of the multiple vital organ dysfunction/failure syndrome (MVOD/F) occur in fulminating infection and septicemia. However, new evidence suggests that septicemia infection may be over implicated. Adding to the fact that most cases of MVOD/F occur in clean post-surgical and trauma patients, the currently available powerful reliable antibiotics should help to reduce sepsis to its real size in order to identify other serious causes of MVOD/F. The commonly applied policy of aggressive fluid therapy in septic and other shock types require careful reconsideration, particularly in the light of new evidence that incriminates volumetric overload.<sup>7</sup>

**Ahmed N. Ghanem**  
**Ismail A. Halim**  
 King Khalid Hospital  
 PO Box 1120  
 Najran  
 Kingdom of Saudi Arabia

#### *Reply from the author*

Sir,

We welcome Dr. Ghanem's comments. As this author notes, Fournier's gangrene is a well known

condition which is essentially necrotizing fasciitis of the scrotum and perineum. It is a polymicrobial synergistic gangrene frequently occurring in the elderly, those with diabetes and the homeless. Its etiology is unknown.<sup>8,9</sup> Fournier's gangrene may also develop after surgery in the perineal area.<sup>10,11</sup> We agree with Dr. Ghanem that Fournier's gangrene, a polymicrobial form of necrotizing fasciitis is neither a new nor a novel entity. Its management as with other forms of necrotizing fasciitis requires urgent patient stabilization, prompt and appropriate antimicrobial therapy and early surgical intervention. Surgery in this area may result in large tissue defects and may be grossly disfiguring. Dr. Ghanem notes that in Table 1 of the review article on necrotizing fasciitis<sup>1</sup> reference is made to end organ damage and specifically renal impairment and the adult respiratory distress syndrome. It is important to note that these criteria are epidemiologic criteria which have been established to help define a streptococcal toxic shock syndrome.<sup>12</sup> We agree with Dr. Ghanem that in many cases of streptococcal toxic shock syndrome, the wound does not appear grossly infected. It is likely that the streptococcal toxic shock syndrome arises as a consequence of group A streptococcus producing its various biological mediators specifically the super antigens<sup>13</sup> which have extensive systemic effects leading to the manifestation observed in the toxic shock syndrome. The management of the Sepsis Syndrome requires all available modalities, specifically, volume replacement, inotropic support, antimicrobial therapy and surgery to debride all affected tissue. More recently, activated protein C has become available for the management of patients with severe sepsis.<sup>14</sup> While it is possible that aggressive fluid therapy may lead to, or aggravate aspects of the Sepsis Syndrome the ultimate outcome of the patient is determined by prompt and aggressive intervention to ensure the stabilization and reversal of the underlying process. Until further studies are available, we suspect that aggressive fluid resuscitation will remain a significant part of the management of patients in septic shock.

**John M. Embil**  
 Health Sciences Centre  
**Catherine Cherneski**  
 Department of Medicine  
 University of Manitoba  
 MS 673, Thorlakson Building  
 820 Sherbook Street  
 Winnipeg, Manitoba,  
 Canada

## References

1. Cherneski CL, Embil JM. Necrotizing fasciitis. *Saudi Med J* 2001; 22: 565-568.
2. Smith GL, Bunker CB, Dinneen MD. Fournier's Gangrene. *Br J Urol* 1998; 81: 347-355.
3. Fournier JA. Gangrene foudroyante de la verge. *Medicin Pratique* 1883; 4: 589-597.
4. Baurienne H. Sur une plaie qui s'est terminée par le spacie de la scrotum. *J Med Chir Pharm* 1764; 20: 251-256.
5. Meloney FL. A differential diagnosis between certain types of infectious gangrene of the skin- with particular reference to haemolytic streptococcus gangrene and bacterial synergistic gangrene. *Surg Gynecol Obstet* 1933; 56: 847-867.
6. Clayton MD, Fowler JE Jr, Sharifi R. Causes, presentation and survival of 57 patients with necrotizing fasciitis of the male genitalia. *Surg Gynecol Obstet* 1990; 170: 49-55.
7. Ghanem AN. Magnetic field-like fluid circulation of a porous orifice tube and its relevance to the capillary-interstitial fluid circulation: preliminary report. *Med Hypotheses* 2001; 56: 325-334.
8. Stone HH, Martin JD Jr. Synergistic necrotizing cellulitis. *Ann Surg* 1972; 175: 702-711.
9. Green RJ, Dafoe DC, Raffin TA. Necrotizing fasciitis. *Chest* 1996; 110: 219-229.
10. Iorianni P, Oliver GC. Synergistic soft tissue infections of the perineum. *Dis Colon Rectum* 1992; 35: 640-644.
11. Nickel JC, Morales A. Necrotizing fasciitis of the male genitalia (Fournier's Gangrene). *Can Med Assoc J* 1983; 129: 445-448.
12. The Working Group of Severe Streptococcal Infections. Defining the Group A Streptococcal toxic shock syndrome. Rationale and consensus definition. *JAMA* 1993; 269: 390-391.
13. Steven DL. Streptococcal toxic-shock syndrome: Spectrum of disease, pathogenesis and new concepts in treatment. *Emerg Infect Dis* 1995; 1: 69-78.
14. Bernard GR, Helterbrand JD, Ely EW, Fisher CJ Jr. Recombinant human protein C worldwide evaluation in severe sepsis (PROWESS) study group. *N Engl J Med* 2001; 344: 699-709.