

Combined Reconstructive Treatment After Debridement of Fournier's Gangrene in the Lower Limb: Progressive Approximation with Flaps Followed by Skin Grafting

Francisco Javier Pérez Lara^{1*}, Arminda Ferrer Berges², Jose Manuel Hernández Gonzalez¹, Emilio Jose Emmanuel Tejero³, Nestor Sánchez Martínez³ and H Oliva Muñoz⁴

¹Digestive Surgeon, Service of Surgery, Hospital de Antequera, Málaga, Spain

²Plastic Surgeon Surgery, Málaga University Hospital, Málaga, Spain

³Urologist, Hospital de Antequera, Málaga, Spain

⁴Chief of Surgery Service, Hospital de Antequera, Málaga, Spain

***Corresponding Author:** Francisco Javier Pérez Lara, Digestive Surgeon, Service of Surgery, Hospital de Antequera, Málaga, Spain.

Received: June 12, 2018; **Published:** July 13, 2018

Abstract

We present the surgical technique used in a patient with Fournier's gangrene affecting the entire posterior right leg and the thoraco-abdominal wall. The tissues were debrided, and in view of the large area exposed, it was necessary to perform a combined reconstruction technique, with progressive approximation using flaps, and then skin grafting

The patient recovered well, and on discharge the only sequelae remaining was occasional mild neuralgia in the right leg.

In our opinion, this technique is of interest in cases of extensive exposure of tissues, in order to avoid large-scale skin grafts (in the case described, the grafting required was reduced by over 50%).

Keywords: *Fournier; Gangrene; Infection; Reconstructive Surgery; Skin Grafting*

Introduction

Fournier's gangrene is an acute and potentially fatal polymicrobial infection [1-3] that usually affects the scrotum, perineum and abdominal wall. It is characterised by synergistic necrotising fasciitis, which leads to thrombosis of the small subcutaneous vessels and as a result gangrene develops in the overlying skin. However, Fournier's gangrene is uncommon (with an estimated total incidence of 1,6/100.000 [4]).

This condition can lead to significant loss of tissues, which may be difficult to overcome since an early and accurate diagnosis of gangrene is difficult. Furthermore, this condition may advance rapidly and provoke death.

We present a severe clinical case, with rapid progressive Fournier's gangrene producing major tissue loss, which was resolved by approximation with flaps, followed by skin grafting.

Clinical Case

We present the technique used in a patient (male, 49 years old) with no relevant medical history, who reported having suffered a scorpion sting in the perineal area a few days previously. The patient consulted with fever, malaise, pain in the perineum and right leg, which was, moreover, swollen.

The CAT scan revealed gas in the soft tissues of the right gluteal area, perineum, and abdominal/thoracic wall (Figure 1).

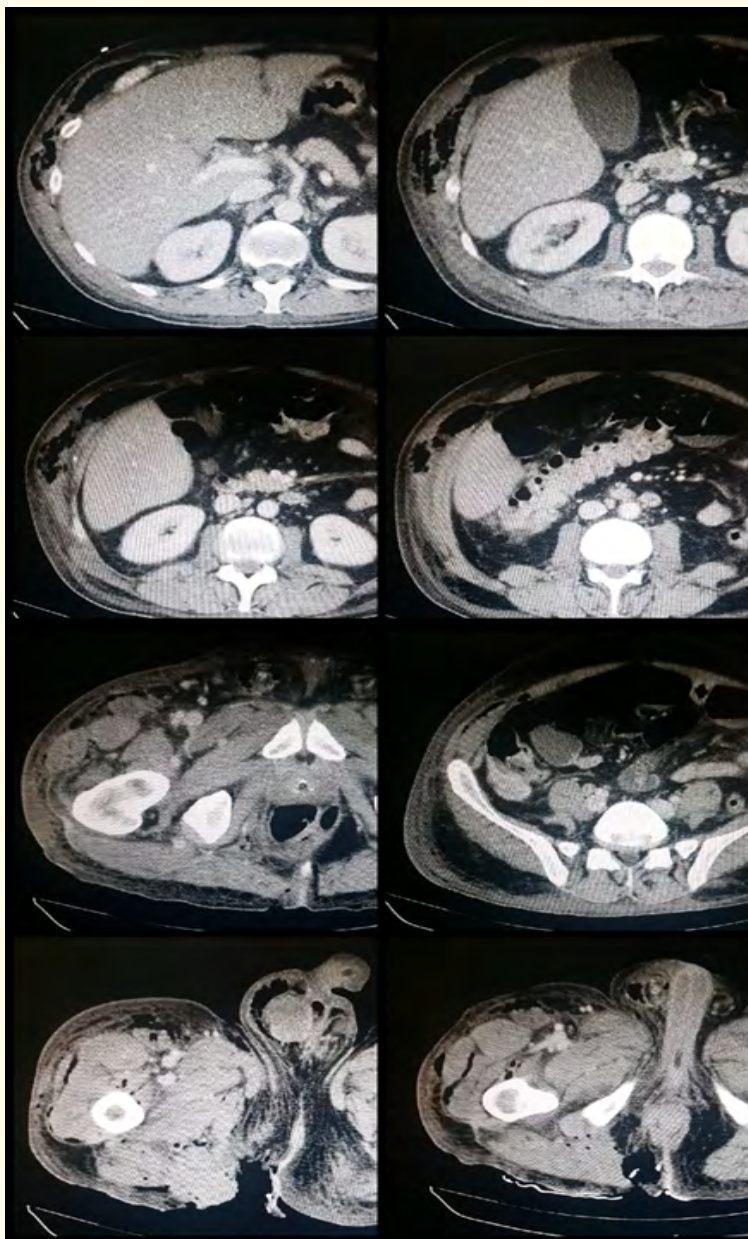


Figure 1: CAT scan revealing gas in the soft tissues of the right gluteal area, perineum, and thoraco-abdominal wall.

The gangrenous tissue was excised from the perineal area, the right gluteal area, the posterior right leg down to the ankle (Figure 2), the right inguinal area and the right abdominal/thoracic wall (where Penrose drains were applied (Figure 3)).



Figure 2: Debridement of all the tissue that presents gangrene: perineal area, right gluteal area, posterior right leg down to the ankle



Figure 3: Debridement of right inguinal area and right thoracic-abdominal wall (where Penrose drains were placed).

The main problem encountered in performing this reconstruction was the significant dimension of the exposed site (from the gluteal area to the ankle). Then after having debrided the necrotic area of the lower limb, an area of 1082 cm² in the right leg remained exposed (Figure 4). In view of this circumstance, we decided to employ a mixed reconstruction technique, first reducing the exposed surface by half and then performing the skin graft, an approach that presents significant advantages.

After the initial therapy (debridement and medical therapy (first with piperacillin-tazobactam 4g/0,5g and later with imipenem 500 mg (culture sensitivity)) for ten weeks), and when culture and blood analysis had confirmed the absence of infection in the tissues (normalized leukocytes and reactive C protein and negative culture analysis), we began the first phase of the reconstruction, which consisted in approaching the dermal adipose flaps as closely as possible by continuous traction, applied as follows: staples were inserted along the edges of both flaps; a vessel loop was then passed between the staples like a shoelace; the vessel loop was used to apply gradual traction for eight weeks, thus bringing the two flaps together (Figure 5), and substantially reducing the exposed area (to 486 cm²) (Figure 4).

Once this approximation of the flaps had been achieved, only the central part of the popliteal area remained exposed, which was reconstructed in the second phase of treatment, in which it was covered with a free-skin graft (Figure 6). The patient recovered well after six weeks, and on discharge the only sequelae remaining was occasional mild neuralgia in the right leg.

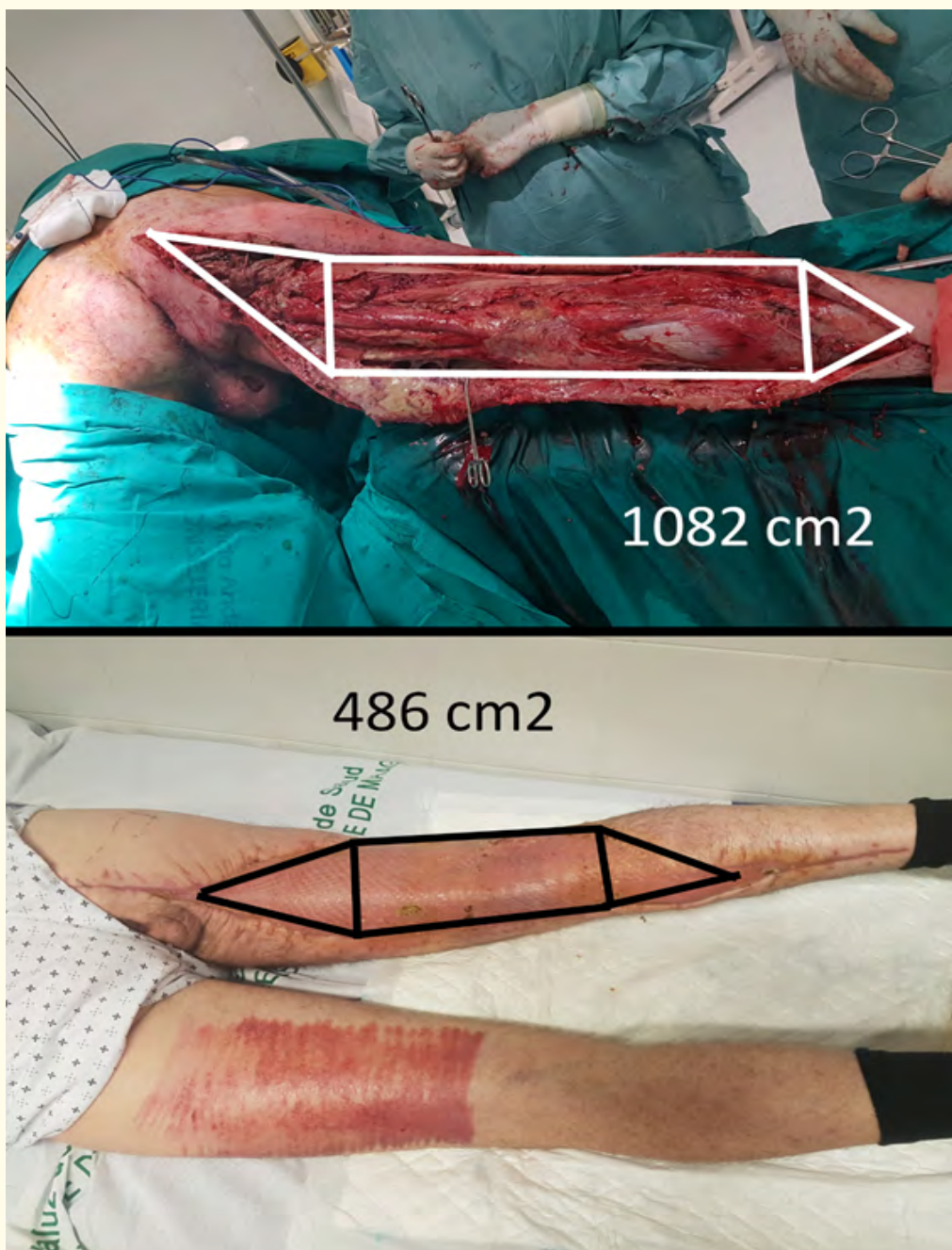


Figure 4: Dimensions of the exposed area before and after the approximation performed, reduced from 1082 to 486 cm² of surface to be grafted.



Figure 5: Progressive approximation of the dermal adipose flaps



Figure 6: Final result after free-skin grafting

Discussion

Fournier's gangrene was first described in 1883 by Jean Alfred Fournier, as an idiopathic scrotal gangrene [5]. Since then it has been redefined as an infectious necrotising fasciitis of the perineum and genital and/or perianal regions.

The pathology, which is rapidly progressive, occurs when host resistance is altered, due to reduced cellular immunity. A suppurative bacterial infection then arises from the invasion of normally commensal organisms into this area. Thrombosis of small subcutaneous vessels also occurs. The combination of these two disease processes leads to the development of gangrene of the overlying skin.

The main cause of death is sepsis. Mortality rates of 4-88% have been reported, with an average of 25 - 40% [6,7]. Older age, diabetes mellitus, delayed treatment and alcoholism are all factors of poor prognosis [8].

However, this high level of mortality has been reduced with improvements in medical examination, the development of antibiotics and advances in medical technology.

Another factor of poor prognosis is when the area of necrotic tissue is greater than 6%. In the case presented, the area of necrotic tissue was over 12%, and so the patient urgently needed a large tissue debridement. In our opinion, this action was fundamental to the patient's subsequent good recovery, since early, aggressive treatment is highly important in such cases.

In Fournier's gangrene, infection can follow three routes: a) via transmission of the bacteria in the lower urinary tract towards the paraurethral gland and spongy body; the penetration of Buck's fascia can enable the infection to spread through the dartos, Colles' and Scarpa's fascia; b) infection can begin near the rectum and spread directly to the scrotum and testicle through Colles' fascia; c) trauma can cause the bacteria present in the skin to penetrate the subcutaneous tissue [9]. In the case we describe, gangrene may have been caused by such a trauma (the scorpion sting) and then followed an unusual double route: downwards (posterior aponeurosis of the right leg) and upwards (aponeurosis of the subcutaneous and muscular tissue of the thoraco-abdominal wall).

This type of infection must be managed aggressively. The recommended treatment consists of immediate extensive debridement and antibiotics, together with the treatment of predisposing conditions.

Diverse techniques used to reconstruct lost tissue have obtained good results. When primary repair is impossible due to lack of skin, skin grafts or flaps (taking myocutaneous skin from the thigh or gracilis) can be used [6].

Studies have described the use of hyperbaric oxygen therapy to treat Fournier's gangrene [10]. The fundamental idea of this approach is that hyperbaric oxygen raises tissue oxygen tension to a level that inhibits and kills anaerobic bacteria. It has also been suggested that this therapy reduces systemic toxicity, limits necrosis and improves the demarcation of gangrene. However, its use is limited by availability, and by the time necessary to transfer a patient to a unit that offers this service. Accordingly, the normal strategy is rapid, aggressive surgery with debridement of necrotic tissues.

We call attention to this case because we believe that in patients with Fournier's gangrene who require extensive debridement, it is very important to reduce the amount of exposed tissues, with the methods available, in order to minimise the surface area to be grafted. By doing so, we reduce the disadvantages of skin grafting (the greater the donor area the more serious the after-effects and, moreover, the greater the body area with lower quality skin).

Conflict of Interest

This type of infection must be managed aggressively. The recommended treatment consists of immediate extensive debridement and antibiotics, together with the treatment of predisposing conditions.

Bibliography

1. Yanar H., *et al.* "Fournier's gangrene: risk factors and strategies for management". *World Journal of Surgery* 30.9 (2006): 1750-1754.
2. Korkut M., *et al.* "Outcome analysis in patients with Fournier's gangrene: report of 45 cases". *Diseases of the Colon and Rectum* 46.5 (2003): 649-645.
3. Ersay A., *et al.* "Factors affecting mortality of Fournier's gangrene: review of 70 patients". *ANZ Journal of Surgery* 77.1-2 (2007): 43-48.
4. Sorensen MD., *et al.* "Fournier's Gangrene: population based epidemiology and outcomes". *Journal of Urology* 181.5 (2009): 2120-2126.
5. Stephens BJ., *et al.* "Fournier's gangrene. historic (1764–1978) versus contemporary (1979–88) differences in etiology and clinical importance". *Annals of Surgery* 59.3 (1993): 149-154.
6. Eke N. "Fournier's gangrene. a review of 1726 cases". *British Journal of Surgery* 87.6 (2000): 718-728.
7. Ecker KW., *et al.* "Necrotizing Fasciitis of the Perineum and the Abdominal Wall-Surgical Approach". *European Journal of Trauma and Emergency Surgery* 34.3 (2008): 219-228.
8. Eskitaşcıoğlu T., *et al.* "Experience of 80 cases with Fournier's gangrene and "trauma" as a trigger factor in the Etiopathogenesis". *Ulus Travma Acil Cerrahi Derg* 20.4 (2014): 265-274.
9. Smith GL., *et al.* "Fournier's gangrene". *British Journal of Urology* 81 (1998): 347-355.
10. Zoranovi U., *et al.* "Hyperbaric oxygenation effects determination in the therapy of chronic occlusive lower extremities arteries disease by the use of perfusion scintigraphy". *Vojnosanitetski Pregled* 67.4 (2010): 279-285.

Volume 5 Issue 8 August 2018

© All rights reserved by Francisco Javier Pérez Lara., *et al.*