Successful Management of Thigh Necrotizing Fasciitis with Debridement-Continuous Irrigation Method: Case Report and Review of the literature

Mahmoud Ababneh[1] and Nidal Younes [2]

Abstract

This study reports an interesting case of left upper thigh necrotizing fasciitis following internal fixation of femur neck fracture in a 60 -year-old man. The patient developed severe necrotizing fasciitis post operatively which was managed by aggressive surgical debridement of infected tissues and intravenous antibiotics. Continuous Irrigation System (CIS) was established on the first debridement session and continued for one week. The patient eventually recovered after one month where he showed no signs of complications or recurrence. The authors describe a new method of treatment combining surgical debridement and continuous irrigation of the wound. Continuous irrigation is a simple and practical way to control soft tissue infections and may contribute substantially to the management of patients with necrotizing fasciitis after initial debridement.

Keywords: Necrotizing fasciitis; Continuous irrigation system; Fracture femur.

(J Med J 2006; Vol. 40 (3): 218- 220)

Received	Accepted
October 27, 2005	June 6, 2006

Introduction

Wilson (1951) described a rapidly spreading necrosis of superficial fascia with severe systemic intoxication and used the term necrotizing fasciitis to characterize this entity.[1] Before that time, several names were used to describe necrotizing fasciitis such as hospital gangrene, Fournier's gangrene and Meleney's gangrene.[2-4]

Necrotizing fasciitis is a fulminant soft-tissue infection that occurs most frequently in the extremities, abdomen, and perineum. The infection spreads along the superficial fascial planes and tracks in several directions instead of walling off to form an abscess. The overlying skin is spared initially, but eventually it becomes erythematous and it can become necrotic when feeding micro vessels become thrombosed.[5]

1. Department of Special Surgery/Section of Orthopedics, Faculty of Medicine, University of Jordan, Amman, Jordan.
2. Department of Surgery, Faculty of Medicine, University of Jordan, Amman, Jordan.
***Correspondence should be addressed to:**
Nidal Younes, MD
P.O. Box : 13024 Amman, Jordan 11942
E-mail: niyounes@ju.edu.jo.

© 2006 DAR Publisher/ University of Jordan. All Rights Reserved.

Predisposing factors include diabetes mellitus, peripheral vascular disease, cirrhosis and alcoholism.[5,6] Mortality rates from necrotizing fasciitis has remained high with mortality rates of approximately 30% ranging from 6% to 76%,[5,6] but these rates had decreased to 21.3% in recent studies.[8,9] Complications of NF include, sepsis, vascular occlusion or thrombosis, and multi organ failure syndrom.[5, 8] Early diagnosis, aggressive surgical debridement and re-debridement and wound care in addition to adequate nutritional support and broad-spectrum intravenous antibiotics are the keys to a successful outcome in necrotizing fasciitis. In this article, we describe a case of thigh NF which was successfully managed by initial debridement followed by continuous irrigation with saline.

Case Report

A 60-year-old man presented to Jordan University Hospital with a base neck fracture of the left femur. He had controlled diabetes and had been well until two days prior to admission when he suddenly fell down and fractured his hip. Open reduction and internal fixation with dynamic hip screw was performed. The patient had a smooth postoperative course and resumed ambulation in the second postoperative day and discharge home six days after surgery. On the 9th postoperative day, the patient presented to the clinic with wound discharge. His white blood cell count was 15.900 cell/ml and he was febrile [38.5^{o}C]. The patient was readmitted to the hospital for further treatment. Upon culture, Enterococcus and Klebsiella were isolated from the wound specimen and Enterococcus was isolated from the blood. These microorganisms were susceptible to Vancomycin and Imipenem and intravenous treatment with these antibiotic started immediately. The patient continued to have fever, and his level of consciousness started to deteriorate. The patient was taken to the operating room on the 14th postoperative day for wound exploration. The wound was reopened where necrosis of the fascia lata; the intermuscular fasciae and the periosteum was encountered. The necrotic material expanded from the lower third of the femur up to the inguinal ligament. No myonecrosis was seen. Debridement of all dead and necrotic tissue was performed and continuous irrigation system with 0.9% saline was established using 3 ports for entry and 3 ports for exit. The system was kept for one week then a second exploration of the wound was done and revealed no further infection. The patient continued to have daily dressing changes and required few minor debridement of the wound during his hospital stay. The wound slowly began to granulate, and the edges were approximated. The rest of the wound was closed with split thickness skin graft.

Discussion

Hospital gangrene, described by Joseph Jones, was probably the first term used for necrotizing fasciitis among wounded soldiers during the Civil War. [2] Meleney (1924) used the term " superficial fascial necrosis" to describe a similar process of spreading infection caused by beta-hemolytic streptococcus.[3] The term necrotizing fasciitis, however, was introduced by Wilson (1952) to characterize rapidly spreading necrosis of superficial fascia with severe systemic intoxication. [1]

The etiology of necrotizing fasciitis in most patients is related either to infection or trauma. In most series of NF, the primary etiology has been a primary infection of unknown etiology, although infections secondary to surgery and abscess have also been reported.[5- 8] Extension along the fascial planes allows infection to spread rapidly in different directions. The surgical management of NF remains a major challenge. Ideally, management should provide adequate debridement of necrotic tissues while minimizing the stress of repeated surgery on extremely sick patients. [5- 8]

Repeated surgical debridement alone mandates repeated wound explorations and has the attendant risks of hemorrhage, significant tissue loss and possible cardiac and respiratory complications. A debridement- continuous lavage method described here has been used to treat one patient with severe necrotizing fasciitis of the thigh complicating fracture femur surgery over one week followed by minor debridement and daily dressing.

The technique mainly consisted of initial extensive debridement of all dead and necrotic tissue followed by a traumatic debridement of further necrosis with continuous irrigation for one week, and re-exploration of the wound to drain loculated collections and debridement of residual necrosis. The CIS may help in debridement of the necrosis as it spontaneously demarcated decreasing the risk of significant tissue loss and the stress of repeated surgery in sick patients.

Wound healing occurred by secondary intention followed by direct suturing of the edges and split thickness graft. The postoperative course was uneventful. Prompt surgical debridement followed by a CIS can be effective in the treatment of NF following internal fixation of long bone fractures.

Necrotizing fasciitis of the thigh is a fulminant soft-tissue infection that requires prompt identification and treatment to ensure survival. Broad-spectrum intravenous antibiotics, aggressive surgical debridement and good intensive care are the mainstays of treatment [9-10.] A debridement-continuous irrigation method is described for the management of necrotizing fasciitis of the thigh. The effectiveness of this management modality permits control of infection without the necessity of extensive repeated debridement in these patients with sepsis who are often critically ill.

References

1. Wilson B. Necrotizing fasciitis. Am Surg 1952; 18:416- 431.
2. Jones J. Investigations upon the nature, causes and treatment of hospital gangrene as it prevailed in the Confederate armies, 1861-1865. In: Surgical Memoirs of the War of Rebellion. New York: U.S. Sanitary Commission, 1871.
3. Meleney FL. Hemolytic streptococcus gangrene. A Surg 1924; 9: 317- 365.
4. Fournier JA Gangrene foudroyant de la verge. Semaine Med 1883; 3; 345.
5. Young MH, Aronoff DM, Engleberg NC. Necrotizing fasciitis: pathogenesis and treatment. Expert Rev Anti Infect Ther. 2005; 3: 279- 294.
6. McHenry CR, Piotrowski JJ, Petrinic D, Malangoni MA. Determinants of mortality for necrotizing soft-tissue infections. Ann Surg. 1995; 221: 558- 63; discussion 563- 565.
7. Younes N, AlQudah MS, Daradkeh S et al. Assessing predictors of outcome in necrotizing fasciitis at Jordan University Hospital. Jordan Med J 2002; 36:34-38.
8. Wong CH, Chang HC, Pasupathy S, Khin LW, Tan JL, Low CO. Necrotizing fasciitis: clinical presentation, microbiology, and determinants of mortality. J Bone Joint Surg Am. 2003; 85-A(8):1454- 1460.
9. Endorf FW, Supple KG, Gamelli RL. The evolving characteristics and care of necrotizing soft-tissue infections. Burns. 2005; 31: 269- 273.
10. Rekha A, Ravi A. A retrospective study of necrotising fasciitis. Int J Low Extrem Wounds. 2003; 2:46-9. fect Ther. 2005;3 :279- 294.