

Experience of the Traumatology-Orthopedics Department of the Rabat Military Hospital in the Management of Necrotizing Fasciitis of the Limbs: A Series of 13 Cases

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Abstract

Original Research Article

Introduction: Necrotizing fasciitis (NF) is a rare, life-threatening necrotizing bacterial dermo-hypodermatitis that extends to the fascial planes. This study reports the experience of a traumatology-orthopedics department at the Rabat Military Teaching Hospital in managing this emergency. This was a retrospective study that included 13 consecutive patients treated for NF of the limbs between 2018 and 2023. Management was multidisciplinary, based on resuscitation, antibiotic therapy, and surgery. The series included 12 patients. Diabetes and immunosuppression were the predominant risk factors. The mean time to first surgical intervention was 4.5 days. All patients required iterative surgical debridement. Coverage surgery was performed later, with a mean delay of 3 to 4 weeks. Beta-hemolytic streptococcus was the most frequent pathogen. NF is a medical-surgical emergency whose prognosis depends on early diagnosis and aggressive, multidisciplinary management. Our experience underscores the crucial importance of extensive and early surgery, combined with appropriate antibiotic therapy.

Keyword: Necrotizing fasciitis, Limbs, Surgical emergency, Debridement, Orthopedics.

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INTRODUCTION

Necrotizing fasciitis (NF) is a rare, rapidly spreading, and life-threatening bacterial infection that causes necrosis of the hypodermis and superficial fascia [1]. Its management constitutes an absolute medical-surgical emergency, and the prognosis is closely linked to the timeliness of diagnosis and therapeutic intervention. The Traumatology-Orthopedics Department of the Rabat Military Teaching Hospital is regularly confronted with this serious condition. This retrospective study aims to analyze the profile, management, and outcome of a series of 13 patients admitted for NF of the limbs between 2018 and 2023, highlighting the specificities of the multidisciplinary management of this entity.

MATERIALS AND METHODS

This was a retrospective study conducted in the Traumatology-Orthopedics Department of the Rabat Military Teaching Hospital.

All adult patients admitted between January 2018 and August 2023 for surgically confirmed

necrotizing fasciitis of the limbs were included. The final cohort comprised 12 patients. *

(Translator's Note: There is a discrepancy between the abstract mentioning 13 patients and the methods/results stating 12. This inconsistency is preserved from the original text.)

Data were collected from medical records using a standardized protocol including:

- Demographic data and risk factors, with a systematic search for diabetes and immunosuppression.
- Infection characteristics: location, portal of entry, and time between first symptoms and first surgical intervention.
- Management modalities: use of imaging (CT scan), number of surgical procedures, need for amputation, time to coverage surgery, antibiotic therapy, and implementation of resuscitation measures and adjuvant therapies (hyperbaric oxygen therapy, immunotherapy, negative pressure wound therapy).

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- Microbiological data from intraoperative samples.
- Prognostic parameters: length of hospital stay and mortality.

The diagnosis of NF was based on intraoperative findings: fascia necrosis, loss of resistance of tissue planes, and presence of necrotic fluid.

RESULTS

The average age of our patients was 59.5 years, with extremes of 48 and 71 years. We noted a male predominance with a sex ratio of 7. Among the 13 patients included, an active search for risk factors identified diabetes and immunosuppression as the predominant comorbidities in this series. Smoking was the second most common risk factor. The etiologies were diverse, primarily domestic accidents from wounds that went unnoticed, or gardening injuries; the involvement of palm tree bark was found in 2 of our patients.

However, the etiology remained unknown in 23% of our patients. A portal of entry was identified in 9 of our patients, often corresponding to puncture wounds considered minor by the patients. The average time between trauma and the onset of symptoms was 6 days. These symptoms corresponded to a swollen, tense, red, and painful limb occurring in the context of a systemic inflammatory response syndrome with fever and patient prostration. Skin necrosis was found in 3 patients (Figure 1). It is noteworthy that 2 of our patients were in a state of severe sepsis and diabetic ketoacidosis. Elevated biological markers of infection were the rule. The diagnosis was primarily clinical and intraoperative. Radiological workup included a standard X-ray of the affected limb and an ultrasound to help assess the extent of the lesions. CT scan was the imaging modality of choice to detect the presence of gas in the tissues, although this sign was often absent. In accordance with established principles, imaging never delayed surgical management.



Figure 1: Clinical appearance showing large, swollen, tense limbs; red

All our patients had received empiric antibiotic therapy based on amoxicillin with a beta-lactamase inhibitor and an aminoglycoside after verification of renal function.

Patients were taken to the operating room after an average delay of 10 hours following stabilization and correction of hydro-electrolytic disorders.

In the operating room, decompressive incisions, debridement, and necrosectomy were performed with bacteriological samples taken at the beginning and end of the procedure (Figure 2). Thus, patients required iterative surgical debridement and washings, and the use of platelet-rich plasma (PRP) to accelerate the healing process (Figure 3). Skin coverage surgery (in particular by graft or direct sutures) was scheduled secondarily, once the infection was controlled, with an average delay of 3 to 4 weeks after the acute phase (Figure 4).



Figure 2: intraoperative images showing the discharging incisions, debridement and necrosectomy with bacteriological samples



Figure 3: use of platelet-rich plasma (PRP) to accelerate the healing process



Figure 4: skin coverage by graft or direct sutures

5 patients required admission to the intensive care unit. All our patients were treated with daily hyperbaric oxygen therapy for 10 days. Negative

pressure wound therapy was considered on a case-by-case basis (Figure 5).



Figure 5: Negative pressure wound therapy

Bacteriological analysis confirmed that beta-hemolytic streptococcus was the most frequently implicated pathogen. Co-infections or infections with other pathogens, including *Staphylococcus* and *Enterobacteriaceae*, were also documented.

DISCUSSION

Our series of 13 cases, treated in a military traumatology-orthopedics department, illustrates the severity and complexity of managing necrotizing fasciitis [1]. The systematic identification of risk factors, particularly diabetes and immunosuppression, is a key element of early diagnosis. This approach is corroborated by the literature, with a meta-analysis by Goh *et al.*, confirming that diabetes is the comorbidity most significantly associated with the occurrence and severity of NF [2].

The mean delay of 4.5 days before surgery in our series highlights the difficulty of the initial diagnosis and the critical therapeutic window of opportunity [2]. Studies, such as the one by Hakkarainen *et al.*, have demonstrated that a delay of more than 24 hours between admission and the first surgical intervention is an independent predictor of mortality [3]. Our practice, which prioritizes clinical diagnosis and does not allow imaging to delay transfer to the operating room, is fully in line with international recommendations [4].

The microbiological landscape observed, dominated by beta-hemolytic streptococcus but often polymicrobial, justifies the antibiotic strategy implemented [3]. The use of an initial, broad-spectrum empiric antibiotic therapy, covering Gram-positive cocci, Gram-negative bacilli, and anaerobes, is a management standard, as recommended by the Infectious Diseases Society of America guidelines [5].

The cornerstone of our management was surgery, summarized by the imperative that it be "early and effective" [4]. The need for iterative debridement to control the spread of necrosis was a constant. The strategy of delayed reconstruction, with skin grafting performed on average at 3-4 weeks, is a prudent and validated approach that ensures the complete eradication of the infection before any definitive coverage, thereby optimizing the success of the graft [6].

Finally, the multidisciplinary approach, integrating resuscitation, aggressive surgery, and antibiotic therapy, is the keystone of success [5]. The considered use of adjuvant therapies such as hyperbaric oxygen therapy and negative pressure wound therapy reflects the commitment to optimizing outcomes. While the evidence for HBOT remains limited, a systematic review suggests a potential benefit on mortality [7]. NPWT, for its part, is recognized for preparing the wound bed by promoting granulation tissue and reducing bacterial load [8].

CONCLUSION

Our experience, based on 13 cases of necrotizing fasciitis of the limbs, confirms the formidable nature of this infection. Its prognosis is directly correlated to the speed of diagnosis and the implementation of aggressive, multidisciplinary treatment. The therapeutic triad – early and extensive surgical debridement, appropriate antibiotic therapy, and vigorous resuscitation – remains the gold standard. The active search for risk factors, the refusal to let imaging delay surgery, and the principle of delayed reconstruction are fundamental pillars of this management. Constant clinical vigilance and close collaboration between the different specialists are essential to improve the vital and functional prognosis of patients.

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