

## A New Case of a Primary Necrotizing Fasciitis of the Chest Wall

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### Abstract

Necrotizing fasciitis or necrotizing bacterial dermo-hypodermatitis is a bacterial dermo-hypodermatitis affecting the soft tissue and muscular fascia. It occurs most frequently along the lower aspects of the body. The primary chest involvement is exceptional. It is a rare condition, rapidly progressive, and a devastating evolution, responsible for a mortality rate of up to 30 to 76%. The most cases reported in the literature are secondary to a medical procedure such as thoracic drainage, or transparietal biopsy. Only an early diagnosis and a rapid and adapted management are able to improve prognosis. We report a new case of a primary chest wall necrotizing fasciitis in a diabetic patient.

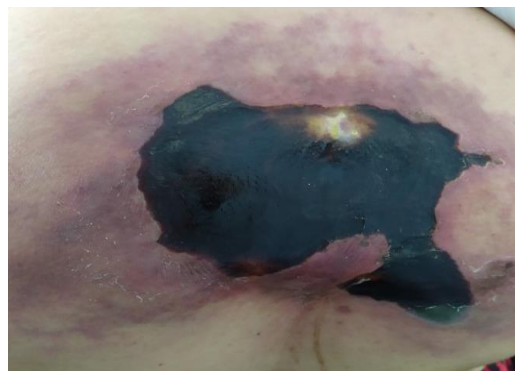
**Key Words:** chest wall ; fascia ; infection ; muscle ; necrotizing fasciitis

### Introduction

Necrotizing fasciitis (FN) is a rare infection of the subcutaneous tissue and deep fascia [1]. It occurs most frequently along the lower aspects of the body, such as the legs, perineum, and lower abdomen [2]. The primary chest involvement is exceptional, and constitutes a diagnostic and therapeutic emergency. The most cases reported in the literature are secondary to a medical procedure such as thoracic drainage, or transparietal biopsy [1]. In addition to this, chest wall necrotizing fasciitis has been highly lethal [3]. We report a new case of a primary chest wall necrotizing fasciitis in a diabetic patient.

### Presentation of the case:

A 53-year-old Moroccan lady, with unbalanced diabetes since 3 years, who has been poorly balanced. She was admitted to the emergency department for a big necrotic lesion of the back with foul smell discharge, evolving since 3 weeks, which had started with a little painful red papule expanding and becoming necrotic. On the top of the lesion she has applied a mixture of medicinal plants. She had not taken any antibiotics. Clinical examination found a feverish patient (39 °), with an hypotension 100/40 mmHg and 94% in saturation. She had a giant and painful necrotic lesion in the posterior chest wall, surrounded by a peripheral erythema (figure 1).



**Figure 1 :** Giant and painful necrotic lesion in the posterior chest wall, surrounded by a peripheral erythema

In addition, no infectious portal of entry has been found. Laboratory analysis revealed a high level of CRP 320 mg / l with a leukocytosis 17210 / mm<sup>3</sup>, hyperglycemia at 3.5 g / l and a high level of lactate 6.48 mmol / l. HIV serology was negative. CT scan showed a large collection of dorsal subcutaneous soft tissues with infiltration of adjacent fat and an important subcutaneous emphysema (figure 2).



**Figure 2 :** Thoracic CT scan with a large collection of dorsal subcutaneous soft tissues with infiltration of adjacent fat and an important subcutaneous emphysema

Emergency surgical debridement was required. A full-thickness necrosis of the posterior chest wall was found, involving the skin, fascia, and muscle layers. The patient then benefited from a large necrosectomy exposing part of the trapezius and large dorsal muscles with abundant washing and the placement of two Delbet blades for drainage (figure 3).



**Figure 3 :** Necrosectomy exposing part of the trapezius and large dorsal muscles with the placement of two Delbet blades.

The resultant defect in the posterior chest wall was covered with mesh. The surgical treatment was associated to a triple probabilist antibiotic therapy with ceftriaxon 2g / d, metronizal 500mg / 8h and gentamycin 320 mg / d. Deep pus culture showed a multibacterial infection by staphylococcus aureus, klebsiella pneumoniae and proteus mirabilis sensible to ceftriaxon and gentamycine. The postoperative outcome was uneventful and the patient was stable at day 2 on post operative. The negative pressure wound therapy (VAC) could not be done because of the unavailability of the treatment.

#### Discussion :

Necrotizing fasciitis (NF) or necrotizing bacterial dermo-hypodermatitis is a bacterial derma-hypodermatitis affecting the soft tissue and muscular fascia [4]. It is the most severe stage of infections of the skin and soft tissues. It affects all the cutaneous planes (epidermis, dermis, hypodermis), deep fascias and sometimes muscles underlying [1]. Unlike cellulite which is limited to the dermis [5]. It is a rare condition, rapidly progressive with devastating evolution, responsible for a mortality rate of up to 30 to 76%. The recognized risk factors are age > 50, diabetes, peripheral vascular disorders (36%), chronic alcoholism and drug addiction (15 to 20%) and immunosuppression (cancers, immunosuppressive treatments, chemotherapy) [1].

In a large series of 166 patients with necrotizing fasciitis, the extremities were the most common site of infection (57.8%), followed by the abdomen (12.1%), perineum (12.1%), buttocks (10.2%), head and neck (8%), and chest (5%) [3]. The primary involvement of the chest wall is exceptional. The few rare clinical cases reported in the literature are secondary to thoracic drainage, pulmonary or esophageal surgery, transparietal pulmonary biopsy or thoracic empyema [6]. A recent Moroccan study has reported 7 cases of primary necrotizing fasciitis of the chest wall [1].

NF is caused by microorganisms called 'flesh eating bacteria', mainly represented by group A beta-haemolytic streptococcus [4]. However, in reality, these bacteria do not feed on the flesh, but release toxins, which are deadly for living cells, or which, by their effects on the immune system, lead to the production of free radicals [5].

In 1977, Giuliano classified NF into Type I and II based on microbial source. Type I is a polymicrobial infection involving mixed aerobic and anaerobic bacteria. Type II is caused by Group A Streptococcus alone or in association with S. aureus. Some studies later classified NF caused by Vibrio spp as Type III [7]. Multi-microbial associations have been found in 40 to 90% of NF. The main germs found are group B streptococcus and Clostridium Perfringens [5]. It has been reported that polymicrobial infections may present in a more insidious manner, unlike monomicrobial infections which often present in a fulminate fashion [3]. In our case, it was a multibacterial infection caused by klebsiella pneumoniae and proteus mirabilis which are present just in 6,1% in the literature [8]. Staphylococcus aureus was also present in our case which is reported in 10,4 % of cases [8].

Clinical features of chest wall necrotizing soft tissue infection are similar to those seen at other sites including wound pain, skin blistering, crepitus, foul-smelling watery discharge from the wound, and dramatic deterioration in the patient's condition. Because there are few early symptoms (cutaneous manifestations



appear late), diagnosis is difficult and may require biological exams and radiographic imaging [3].

Early diagnosis and treatment are the two main factors responsible for the prognosis [1]. The antibiotic treatment must be started immediately, even before the results of the microbiological analyses. The recommended antibiotic treatment consists in the association of  $\beta$ -lactamine, imidazole+aminoside [4]. It is complementary to the surgery because the local diffusion of antibiotics is weak because of the vascular thromboses responsible for the necrosis of the deep planes [5].

Wong *et al.* proposed a different approach to the debridement in necrotizing fasciitis, involving the classification of the affected area into the three surgical zones: (1) Necrotic tissue, which is completely excised; (2) infected but potentially salvageable soft tissue, which is carefully assessed and progressively cut back; and (3) non-infected skin, which is left alone [3].

The additional use of a negative pressure wound therapy (VAC) and hyperbaric oxygen therapy for management of NF of the chest wall has been reported with success.[4]

#### Conclusion :

Our case is added to the few cases published in the literature of a primary NF of the chest wall, to alarm, against this entity specially in diabetic patient. Only an early diagnosis and a rapid and adapted management are able to improve prognosis.

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