

# Necrotizing Fasciitis in the Sub-Saharan Zone: Analysis of an Exceptional Case and Review of the Literature

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## Abstract

Necrotizing fasciitis (FN) are severe, fulminant infection with necrosis of the skin and superficial fascia. The variability of the clinical picture and the severity of the condition make it a formidable condition. B.A, 16 years old, breeder, was admitted to ENT hospitalization for a large necrotic cervico-thoracic and dorsal ulceration of sudden onset following febrile odynophagia. ENT examination: large necrotic wound extending from the antero-posterior cervical region to the thoraco-abdominal and dorsal region, letting pus weld with trismus at 1.5 cm and a fistula of the anterior pillar of the right tonsil. Cytobacteriological examination of the pus isolated *Staphylococcus aureus*. We instituted a probabilistic antibiotic therapy readjusted afterward to the association amoxicillin clavulanic acid with the result of the antibiogram. Incision, drainage and surgical debridement of all necrotic tissues were performed, leading to extensive loss of skin substance. A daily local dressing was applied for 11 days, then replaced by honey for 51 days. On the 64th day, he was entrusted to the dermatology department for a skin graft where he stayed for 3 months. Conclusion: current name, necrotizing bacterial dermohypodermatitis. Surgery has a key role in treatment. Antibiotic therapy should be broad-spectrum.

## Keywords

Necrotizing Fasciitis, Surgery, Sequelae

## 1. Introduction

Necrotizing fasciitis (FN) is a severe, fulminant infection of the skin and soft

tissues characterized by a necrotizing infection of the subcutaneous tissue involving the superficial fascia and possibly extending to the muscles [1]. The 2000 consensus conference clarified anatomical terminology and definitions. A distinction is thus made between non-necrotizing bacterial dermo-hypodermatitis (DHB), necrotizing bacterial dermo-hypodermatitis (DHBN), and necrotizing fasciitis (FN) corresponding to necrotic damage to the pre-muscular aponeurosis and deep fascias [1] [2]. The clinical picture of DHBN-FN is variable, ranging from isolated cutaneous or subcutaneous necrosis to septic shock [2]. The severity of the condition depends on the anatomical site and the virulence of the germs in question [3]. The sites preferentially affected are the lower limbs in 75% of cases, as well as the perineum and the abdomen. Cervical localization is rare with a mortality rate between 7% and 20% of cases [3].

## 2. Objective

The objective of this work was to report 1 case of necrotizing fasciitis notable for the fulgurance of its clinical presentation and its tonsillar origin.

As for the ethical aspect: This is a purely scientific work that aims to improve the quality of care. The consent of the patient as well as the parents was obtained beforehand.

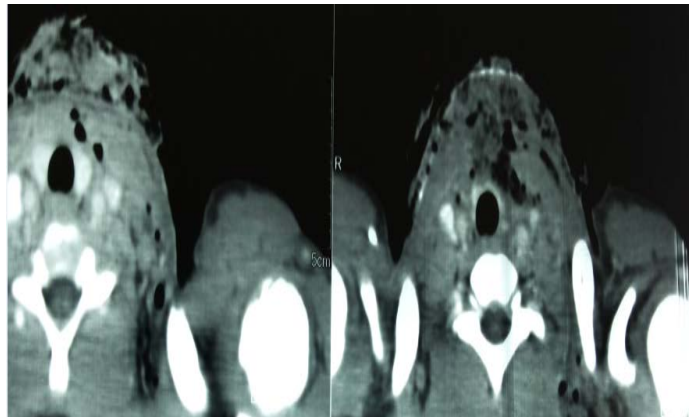
## 3. Observation

B.A, 16 years old, male, breeder, was admitted to ENT-CCF hospitalization for a large necrotic cervico-thoracic and dorsal ulceration. The interrogation found a notion of right laterocervical tumefaction of sudden onset following a febrile odynophagia 10 days earlier. The evolution was marked by the extension of the swelling to the thoracic and dorsal levels following traditional treatment such as fumigation. On admission, there was a large necrotic wound extending from the anteroposterior cervical region to the thoraco-abdominal and dorsal region leaving pus to weld (**Figure 1**). Examination of the oral cavity and the oropharynx found trismus at 1.5 cm and a fistula of the anterior pillar of the right tonsil. The rest of the ENT examination was unremarkable. The general examination found a temperature at 39°C 1/10th, a BP at 100/70 mmHg; HR: 118 beats/min; HR: 19 cycles/min. CBC found hyperleukocytosis predominantly polymorphonuclear neutrophils with hypochromic microcytic anemia. HIV serology, glycaemia and creatinaemia were normal. Cytobacteriological examination of the pus isolated *Staphylococcus aureus*.

Computed tomography (CT) objectified multiple areas of hypodensity alternating with clarity pointing to tissue necrosis (**Figure 2**). We started a probabilistic antibiotic therapy based on ceftriaxone 2 g per day intravenously associated with metronidazole 500 mg in infusion three times a day, then readjusted after the result of the antibiogram to the association amoxicillin clavulanic acid. An analgesic treatment made of paracetamol 1 g infusion every 6 hours and a mouth-wash.



**Figure 1.** Image of the patient on admission visualizing extensive necrosis.



**Figure 2.** Axial CT scan passing through C6 objectifying. Aeric clarities within the antero-cervical soft tissues, and bilateral laterocervical.

Surgical management was performed in the operating room with incision, drainage and surgical debridement of all necrotic tissue leading to a large loss of skin substance (25 cm·W × 45 cm·L) (**Figure 3**). In the post-operative period, a daily local dressing with Dakin was applied for 11 days, then replaced by honey for 51 days. At 64 days, after satisfactory budding of the wound, the patient was referred to the dermatology department for a skin graft where he stayed for 3 months; then the rest of the follow-up was done on an outpatient basis until the complete healing after 9 months but with sequelae bands (**Figure 4**).

#### 4. Discussion

Necrotizing fasciitis (FN) is a severe infection characterized by necrosis of the dermis and hypodermis extending to the aponeurosis. A skin rash precedes the



**Figure 3.** Image of the patient 22 days postoperative.



**Figure 4.** Image of the patient after healing 9 months after the start of treatment leaving bands at the cervical level.

infection in 60% to 80% of cases [2] [3]. The most frequently found germ is group A beta-hemolytic streptococcus. This germ is capable of secreting various exotoxins responsible for skin manifestations and also streptococcal toxic shock [4]. In our case, the isolated germ was *Staphylococcus aureus*. The monobacterial isolation observed in our experience is less frequent than the classic microbial plurality found in the literature [1] [4] [5]. This soft tissue infection, described as “flesh-eating”, progresses rapidly [3], as shown in our clinical case. The infection

begins with necrosis of the hypodermis with vascular thrombosis. The necrosis extends secondarily to the underlying superficial aponeurosis and then secondarily to the dermis. Its evolution is lightning, thus generating a high mortality rate of 30% to 76%. [6].

In accordance with the cases described in the literature, the risk factors are, among other things, age over 65, diabetes, alcoholism, blood diseases and cancers, taking nonsteroidal anti-inflammatory drugs (NSAIDs) or immunosuppressive treatments, which are recognized risk factors for FN [4] [5] [6]. In our study, the risk factors found were the notion of taking nonsteroidal anti-inflammatory drugs and fumigation of the patient. Dental pathology is responsible for most cases of cervico-facial necrotizing fasciitis, but oropharyngeal origin, blunt trauma, burns, and insect bites of the face or neck have been reported [7] [8]. In our case, the amygdala origins associated with the concept of burns by fumigation were incriminated.

Early diagnosis of FN remains difficult even in expert hands. Blisters, purplish bullae and skin necrosis only appear late in the infectious course. The only early cutaneous sign is erythema, an aspecific sign found in all cellulitis. [3] [9]. One of the most important factors in the diagnosis of FN is the fulminant course of the disease requiring a thorough history. Unlike abscesses or cellulitis, which evolve over days or weeks, FN progresses extremely rapidly, on the order of hours [10]. To support the diagnosis, Wong *et al.* established a laboratory risk indicator for necrotizing fasciitis (LRINEC). This biological risk score for necrotizing fasciitis is summarized in **Table 1** with a positive (92%) and negative (96%) predictive rate. The score is determined by 6 serological markers. A score of 6 is relatively a specific indicator of necrotizing fasciitis (specificity 83.8%), but a score < 6 is not sensitive enough (59.2%) to rule out necrotizing fasciitis [10] [11].

**Table 1.** Laboratory risk indicator for necrotizing fasciitis (LRINEC) score.

Serological markers	Values	scores
C-Reactive Protein, mg/l	<150	0
	≥150	4
Total WBC count (×10 <sup>3</sup> /mm <sup>3</sup> )	<15	0
	15 - 25	1
	>25	2
Hemoglobin (g/dL)	>13.5	0
	11 - 13.5	1
	<11	2
Sodium (mmol/L)	≥135	0
	<135	2
Creatinine (mmol/L)	≤141	0
	>141	2
Glucose (mmol/L)	≤10	0
	>10	1

Medical imaging also plays an important diagnostic role in case of clinical doubt. CT scan, although sensitive (80%) is also non-specific. Magnetic resonance imaging (MRI) has a sensitivity of 100% and a specificity of 86%. Magnetic resonance imaging (MRI) was found to be more sensitive than computed tomography in detecting FN. MRI detects the presence of multiple “hypersignal” zones in the deep dermis on T2 weighting as well as inflammation of the fascia characterized by a hyposignal on T1 weighting and a hypersignal on T2 weighting. The absence of enhancement after administration of gadolinium in T1 weighting indicates fascial necrosis [9] [10].

Surgical exploration is the key to diagnosis and treatment. The incision is made at the place where the skin seems to be the most affected. The presence of healthy subcutaneous fatty tissue up to the muscular aponeurosis makes it possible to stop further dissection and to stick to antibiotic treatment. On the other hand, if the surgical exploration shows necrotic tissues up to the muscle aponeurosis or a purulent-looking liquid, the dissection must continue until a healthy zone is reached. This can be facilitated by putting the finger between the subcutaneous tissue and the other tissues which peel off easily until the visualization of a healthy zone. Complementary resections at a later stage are often necessary. Reconstructive surgery will be considered secondarily [5] [12]. In the literature, in addition to surgical treatment, triantibiotic therapy is started, combining beta-lactam, aminoglycoside and clindamycin or metronidazole [4] [8].

In this study, the probabilistic antibiotic therapy was Ceftriaxone combined with reacted metronidazole after the result of the amoxicillin + clavulanic acid susceptibility test. Surgical debridement having caused extensive loss of skin substance, honey was ideal for promoting rapid budding. Secondly, in collaboration with the dermatology department, we performed autologous thin skin grafts to repair the loss of skin substances. Surgical sequelae after debridement are often significant. In addition to the aesthetic impact, which is often major (**Figure 3**), functional sequelae can also be found. The hospital stay for patients with necrotizing fasciitis is often very long. Authors report average lengths of stay of 21 days in intensive care and 29 days for the entire hospitalization. The total duration of hospitalization can exceed 100 days [12] [13]. These patients often present, on the occasion of severe sepsis, multiple visceral failures requiring hospitalization in intensive care. During this entire period, patients undergo many surgeries. It is understood in these conditions that the hypercatabolism of these subjects is absolutely major and must be compensated by adequate nutrition [13].

## 5. Conclusion

Necrotizing fasciitis is serious infection, now known as bacterial necrotizing dermohypodermatitis. Management must be multidisciplinary and as early as possible. For a very large number of patients, hospitalization in intensive care is necessary given the frequency of visceral failures. The lesions encountered are



very varied, both in their locations and in their type and extent. Whatever the lesions, the prognosis is directly dependent on the precocity and the quality of the first debridements and excisions. The structure where these patients are hospitalized must have staff trained in the production of complex dressings and have numerous specialized correspondents. Hospital stays are often very long and patients benefit from numerous surgical procedures. In most cases, plastic surgery interventions are secondarily necessary. The key to treatment is surgery. It should never be compensated. Antibiotic therapy should be broad-spectrum.

### Author Contributions

All the authors contributed to the realization of this work. All read and approved the final version of the manuscript.

### Conflicts of Interest

The authors declare no conflict of interest.

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