

SUCCESSFUL TREATMENT OF PROGRESSIVE NECROTIC FASCIITIS (CLINICAL CASE)

Babajanov B. D.
U. K. Kasimov,
T. Sh. Atajanov

Abstract:

Necrotizing soft tissue infections is a formidable disease either presenting on its own or as a result of various manipulations. It is a potentially fatal condition that usually affects the soft tissues of the extremities, abdominal wall and perineum. However, the condition can also manifest in other parts of the body. Predisposing factors include the presence of comorbidities, advanced age, and chronic alcoholism. The mammary gland is rarely affected and, in most cases, it is a consequence of various manipulations, in particular puncture methods of treatment, inadequate conservative therapy, or trauma. The paper presents a clinical case of necrotizing fasciitis of the breast in a 29-year-old female patient with no identified risk factor and provides a therapeutic and diagnostic concept in relation to necrotizing infection.

Keywords: necrotizing infection, necrotizing fasciitis, myonecrosis, mastitis, necrotizing cellulitis.

Introduction

Necrotizing soft tissue infections (NIMTs) are rapidly progressive infections of the skin and soft tissues that cause widespread tissue necrosis and are associated with systemic disease [1]. The term "NSTI" is increasingly used instead of the term "necrotizing fasciitis", originally coined by B. L. Wilson in 1952, to cover cases where necrosis extends beyond the fascia and can affect muscles, skin and surrounding tissues[2].

Depending on the depth of tissue infection and necrosis, necrotizing soft tissue infection can be divided into three forms, which include dermis and subcutaneous tissue for necrotizing cellulite, fascia for necrotizing fasciitis, and a muscle layer with intact overlying skin for necrotizing myositis [3].

The incidence and prevalence does not have a definite trend related to the season, location and patient population.

Diagnosis of these conditions is difficult because studies show a high incidence of misdiagnosis upon admission [4], mainly because the initial clinical manifestations may be underestimated and the chosen treatment tactics accordingly.

A Clinical Case

Patient D., born in 1992, was admitted to the department of purulent surgery and surgical complications of diabetes mellitus at the multidisciplinary clinic of the Tashkent Medical Academy. Upon admission, the patient complained of pain in the left breast, the presence of painful compaction and cyanosis in the left breast, with a seal with a transition to the lateral surface of the neck and sternum, an increase in body temperature to 38.0°C, lack of appetite, weakness.

In the anamnesis, ten days before admission, the patient received a blunt trauma to the area of the left breast (falling down the stairs). After receiving an injury, the patient goes to a medical institution, where the patient is examined and a post-traumatic hematoma is detected. The patient is undergoing a diagnostic puncture in which blood is aspirated in a small amount and conservative therapy in the form of compresses is prescribed. Over the course of four days, the patient's condition is without positive dynamics and the patient turns to traditional healers who performed punctures followed by the administration of drugs (she does not remember the name of the drugs).

There is no history of diabetes, hypertension, HIV infection, smoking or any other chronic diseases.

On examination: the condition of the patient is of moderate severity. Body temperature 37.8 °C, blood pressure 120/70 mmHg, tachycardia with a pulse rate of 118/min. Locally: on examination, there is a slight asymmetry of the mammary glands, due to an increase in the left breast.



Figure 1. The appearance of the patient on the day of admission.

At the same time, in the left mammary gland, starting from the areola with the transition to the inner-upper quadrant, skin cyanosis is determined. Foci of cyanosis are also detected in the projection of the lower third of the sternum (Figure 1).

Tissue compaction was detected palpationally, with moderate soreness, while the boundaries of the compaction went beyond the visible altered part (Figure 2).



Figure 2. The boundaries of the identified altered tissues (highlighted with a marker).

The boundaries of the seal capture the tissues of the sternum and pass to the lateral surface of the neck on the left. At the same time, the fabrics are not visually changed. There were no characteristic signs of inflammation. There was an increase in cervical and axillary lymph nodes on the left. The right breast is without features.

Upon admission, leukocytosis ($12 \times 10^9/l$) with a left shift (78% of neutrophils) and anemia (91 g/l) were detected in the laboratory. In the biochemical analysis of blood: blood sugar 7.2mmol/l; bilirubin 19.2 mmol/L, direct 0.8, indirect 1.9; ALT 0.3; AST 0.6; total protein 63g/l; fibrinogen 6 g/l; CRP 2.1mg/l.

Ultrasound of the mammary glands showed a diffusely swollen and enlarged mammary gland with a twisted echogenic fatty component and a hypoechoic edematous glandular component, without cavities and a normal contralateral mammary gland. There is a layer of fluid in the sternum and neck area.

To diagnose surgical infection of soft tissues, we used an early diagnosis scale, which allows us to identify areas of altered tissues. According to this scale, there are certain clinical signs of the development of surgical infection of soft tissues, which together make it possible to accurately determine the purulent process in soft tissues, with the determination of indications for surgical intervention.

The patient started empirical antibacterial therapy with intravenous administration of piperacillin+tazabactam 4.5*3 times, clindamycin 600mg * 2 times, amikacin sulfate 500mg*2 times. A mandatory component was the inclusion of flucanazole 200mg*1 at a time. Infusion therapy included the administration of reosorbilact 200.0 * 1 time, glucose 5% 400.0* 1 time, infusol 500.0*1 time.

Against this background, the patient was taken for surgery. The operation was performed under intravenous anesthesia. The patient underwent an autopsy of foci in the sternum, breast, supraclavicular region on the left and neck (Figure 3).



Figure 3. Necrosis of the superficial fascia with thrombosis of breast tissue and subcutaneous fat.



Figure 4. Necrosis of the superficial fascia with spread to the neck.
The incision showed that there was a cloudy discharge in the fiber and a necrotic process dominated, which loosely passed to the supraclavicular region and into the neck (Figure 4). During the operation, excision of necrotic tissue within relatively healthy tissues, thorough washing of the wound with hydrogen peroxide, Decasan, taking a sample for seeding and sensitivity, as well as histopathological analysis. The wound was left open for daily follow-up rehabilitation.

Histological examination of the sample by hematoxylin and eosin staining showed the presence of diffuse inflammatory infiltration by segmented neutrophil leukocytes and lobular destruction (Figure 5).

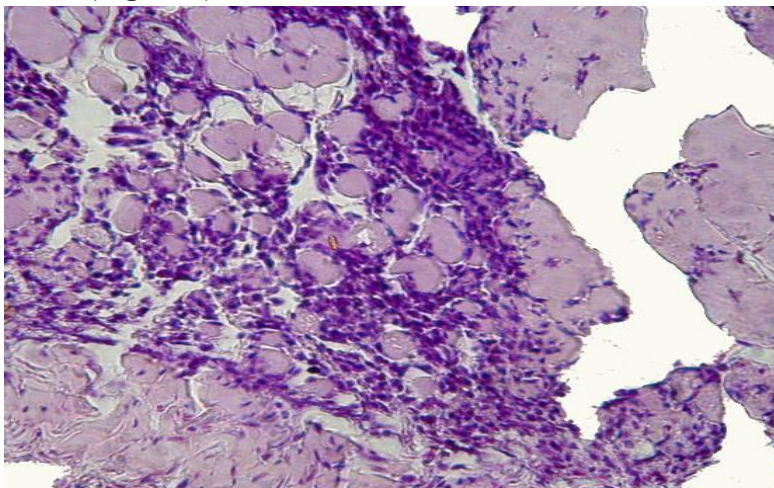


Figure 5. Diffuse inflammatory infiltration by segmented neutrophilic leukocytes.

The microbial landscape showed the preservation of polymorphism of the identified pathogens. Thus, *Staphylococcus* spp. - 12%, *E.coli* - 18%, *Proteus* spp. - 15%, *Streptococcus pyogenes* - 12%, *Staphylococcus faecalis* spp. - 3% were sown from aerobes. Anaerobic microflora was represented by *Peptostreptococcus* spp. - 6%. Fungal flora was detected on the 1st day of treatment in 3% and is represented by fungi of the genus *Candida*.

Against the background of ongoing conservative therapy, local sanitation with Fargal.



Figure 6. Delineation of the process with preservation of the necrotic process.

The necrotic process persisted in the wound dynamics, the tissues were ischemic. There is no active purulent discharge, the process is limited (Figure 6).

The patient underwent a staged necrectomy, with excision of all the altered tissues (Figure 7).



Figure 7. Type of wound process on day 6, after necrectomy.

Local sanitation continued with the use of Oflokelid ointment, twice a day. On day 10, the patient was discharged for outpatient treatment in a satisfactory condition, with a sluggish wound and recommendations for further management of the wound process.

At the next examination, the patient revealed the presence of a painful seal in the right breast and the patient was re-hospitalized in the department and an autopsy and necrectomy of the lesion in the right breast were performed. The dynamics of the appearance of active granulation (Figure 8).



Figure 8. The wound is clean, there is active granulation.

On the 30th day, at the next examination, the wound is completely epithelized, but there is a rough postoperative scar (Figure 9).



Figure 9. The type of wound process on the 30th day, there is a postoperative scar.

Discussion

Necrotizing fasciitis is an aggressive, rapidly spreading infection of the skin and subcutaneous tissue. Its appearance in the mammary gland is extremely rare, especially after routine procedures. Its occurrence in the mammary gland is infrequent in patients without risk factors, and so far only seven cases have been reported in the literature in non-lactating women [10]. In the case of necrotic fasciitis of the breast, the skin manifestations may be invisible due to the thicker tissue between the deep fascia and the skin. By the time the skin signs are noticed, the damage will be extensive and may require a mastectomy [8].

The diagnosis of necrotic soft tissue infection remains predominantly clinical and is based on a clinical examination showing signs of inflammation with discoloration of the skin and pain disproportionate to local manifestations, along with systemic toxicity and subcutaneous crepitation. However, due to the scarcity of skin manifestations in the early stages of the disease, diagnosis can be extremely difficult and requires a high degree of alertness. Sometimes the final diagnosis can be made only intraoperatively, when the characteristic signs of inflammation are not detected [7,13].

A delay in diagnosis can lead to sepsis, septic shock and death[8].

Necrotizing fasciitis can cause a violation of various biochemical and hematological parameters, on the basis of which the LINEC scale was developed, which includes: blood glucose, total leukocyte count, hemoglobin, serum sodium, C-reactive protein and serum creatinine [11].

According to M. V. Grinev et al. [6, 8], morphological changes in fascial formations in necrotic fasciitis initially have the character of wet gangrene, and its spread occurs according to the scale of regional (zonal) violation of the microhemodynamics of fascia.

A characteristic feature of local manifestations is the discrepancy between visually detectable relatively limited local necrosis of the skin and extensive putrefactive necrotic lesions of subcutaneous adipose tissue and fascia (the phenomenon of the "tip of the iceberg"). This explains the underestimation of the severity of the patient's condition associated with the well-known symptom of "clinical scissors" - the discrepancy between the severity of the general condition and the insignificant area of necrotic changes in the fascia of soft tissue structures. The main necrotic process develops under the skin, often necrotically unchanged or slightly modified, and remains unrecognized [6,14]. This circumstance allows us to assert that, based only on external manifestations, it is not always possible to verify the diagnosis of NF, which is the reason for late diagnosis and delay in complex treatment.

The main concepts of treatment of necrotizing soft tissue infections are: early diagnosis and differentiation; early initiation of empirical antibacterial coating (broad spectrum of action) and surgical aid; adequate control of infection sources; identification of infectious agents and appropriate correction of antimicrobial effects [12,15].

Conclusion

The presented clinical cases clearly demonstrate the peculiarities of the manifestation of the clinical picture of necrotic soft tissue infections and, accordingly, the complexity of their diagnosis. They are prone to progression, accompanied by severe intoxication and high mortality. The results of treatment are largely determined by timely clinical diagnosis, which makes it possible to suspect the presence of necrotic lesions at an early stage and, accordingly, to carry out surgical tactics in a timely manner, complemented by an adequate set of conservative therapeutic measures.

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