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# NECROTIZING FASCIITIS IN A CHILD: CLINICAL CASE

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# КЛИНИЧЕСКИЙ СЛУЧАЙ НЕКРОТИЗИРУЮЩЕГО ФАСЦИИТА У РЕБЕНКА

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The article highlights a clinical case of diagnosis and successful treatment of necrotizing fasciitis in a 4-year-old child. The clinical picture of the onset and course of the disease, the difficulties of differential diagnosis, as well as methods of diagnosis and treatment are described. It should be noted that this pathology in childhood develops at lightning speed. However, in the initial stages, it can proceed under the guise of other diseases, such as acute hematogenous osteomyelitis.

*Keywords: necrotizing fasciitis, Streptococcus pyogenes, children, ozone therapy, treatment*

Освещен клинический случай диагностики и успешного лечения некротизирующего фасциита у ребенка 4 лет. Описана клиническая картина течения заболевания, трудности дифференциальной диагностики, а также методы диагностики и лечения. Следует отметить, что данная патология в детском возрасте развивается молниеносно и может на начальных стадиях протекать под маской других заболеваний, таких как острый гематогенный остеомиелит.

*Ключевые слова: некротизирующий фасциит, Streptococcus pyogenes, дети, озонотерапия, лечение*

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ARVI – acute respiratory viral infection
MRI – magnetic resonance imaging

**Necrotizing fasciitis is a rare and life-threatening soft-tissue infection characterized by rapidly spreading inflammation and subsequent necrosis of the fascial planes and surrounding tissues [1, 2]. The clinical course is particularly severe and has a high mortality rate without timely comprehensive treatment [3]. It is usually a rapidly progressive infection, commonly caused by Streptococcus pyogenes, a group A beta-hemolytic streptococcus [4]. The inflammation rapidly spreads through the fascia, accompanied by severe intoxication, which does not correspond to the severity of local inflammatory changes in the early stages. Early diagnosis and radical surgical treatment of the pathological focus are crucial to successfully managing this disease [5].**

**Clinical case.** Child K., four years old, was admitted on December 22, 2022, with complaints of pain in the left upper and right lower limbs and fever. Anamnesis Morbi: seven days before admission, a single body temperature rises to 37.8 °C with no accompanying symptoms. Four days after the first episode, a temperature rise to 40 °C was registered, accompanied by chills and catarrhal syndrome. The parents sought medical advice in the district pediatric outpatient clinic, where the pediatrician prescribed symptomatic treatment for acute respiratory viral infections without a visible positive effect. The high temperature lasted for three days. Then, pain in the left upper limb, moderate edema, and hyperemia of the soft tissues of the left shoulder along the anterior surface was detected. Over time, soft tissue swelling of the left upper limb began to overgrow, complaints of pain in the right lower limb appeared, and the child stopped stepping on the foot and began to spare it while walking. The patient was admitted to the hospital by an ambulance. On admission, his condition was severe due to expressed symptoms of intoxication. Locally, a dense, warm swelling of the soft tissues of the left shoulder and moderate hyperemia along the interior surface of the left shoulder were detected. On palpation, expressed tenderness in the edema area was noted. The movements in the left shoulder joint were preserved. The activities in the left elbow joint are limited due to severe pain (Fig. 1). While examining the lower limbs, moderate swelling in the area of the posterior surface of the hip joint with the transition to the gluteal region was observed. Palpation in the area of the right hip joint was painful, and movements were limited.

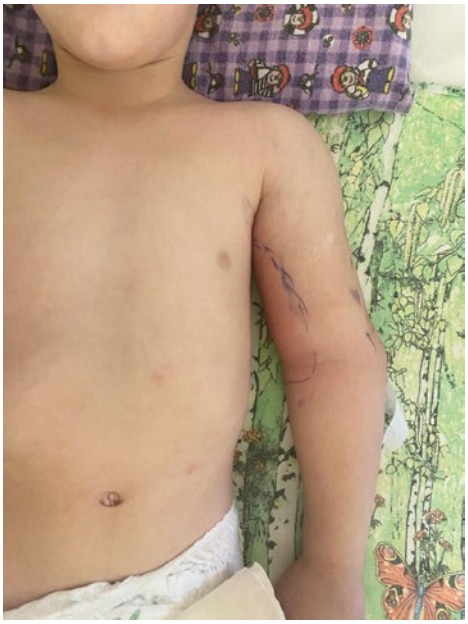

*Fig. 1.* Swelling of the left shoulder

The preliminary diagnosis at the admission stage was acute hematogenous osteomyelitis of the left humerus? Arthritis of the left elbow joint? Arthritis of the right hip joint? The child was moved to a pediatric intensive care unit.

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Lab investigation results of the blood test showed moderate leukocytosis, $14.8\times10^9$/l, with a left shift. C-reactive protein was 13.14 mg/dl. Procalcitonin was above 10 ng/ml. X-Ray of the left and right humerus: the reaction of periarticular tissues in the projection of the left humerus, the soft tissues of the left shoulder were heterogeneous in density; no pathological changes in the right shoulder bone. Ultrasound examination results: the signs of edema of the subcutaneous layer of the left shoulder and the right thigh, and swelling of the right iliopsoas muscle.

The puncture of the soft tissues of the left shoulder and humerus was performed. The bone marrow without pressure was obtained from the metaphysis. In bacterioscopy, blood was noted in the smear, but microflora was not detected. The child received antibacterial (maxiktam, linezolid, and metronidazole) and infusion therapy. However, no positive effect was seen; an intense hot swelling of the left shoulder rapidly progressed, spreading over 4 hours from the left shoulder joint to the middle third of the forearm. MRI of the affected limbs (Fig. 2) was conducted to diagnose the nature and prevalence of bone and soft tissue lesions. An extensive muscles swelling, interfascial spaces with fluid accumulation, and subcutaneous tissue with a possible violation of muscle trophism were found, indicating a sign of necrotizing fasciitis.

Surgery December 23rd, 2022, on the external surface of the left shoulder in the lower third (in the place of the former puncture of the humerus), a 3 cm incision of the skin, subcutaneous tissue, and a superficial fascia of the shoulder was performed. A large amount of cloudy effusion was released from the subcutaneous tissue and interfascial spaces. Subcutaneous tissue was edematous with mild bleeding. Fascial compartments were a whitish-greenish color with no bleeding; the muscles with no bleeding too (Fig. 3). Taken into consideration the condition of the soft tissues, the skin incision was extended to the deltoid muscle; the fascial compartments of the biceps, brachial, and triceps muscles were opened. A considerable amount of cloudy liquid was released.

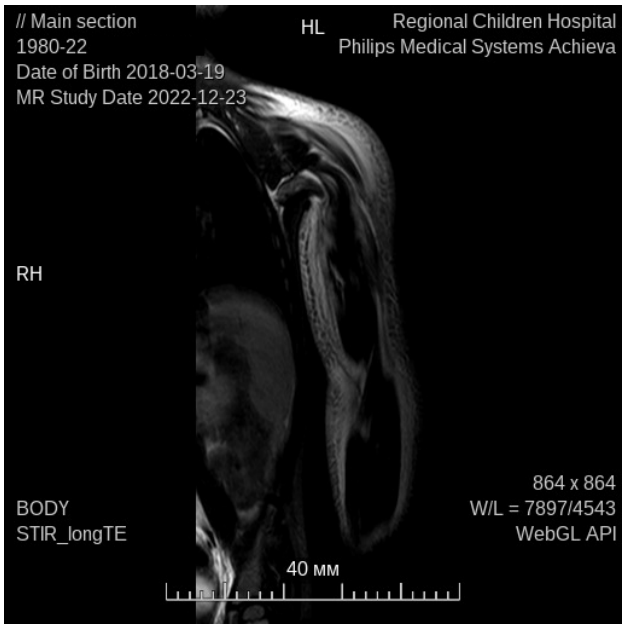


*Fig. 2.* MRI of the left shoulder. Extensive swelling of muscles and interfacial spaces with fluid accumulation

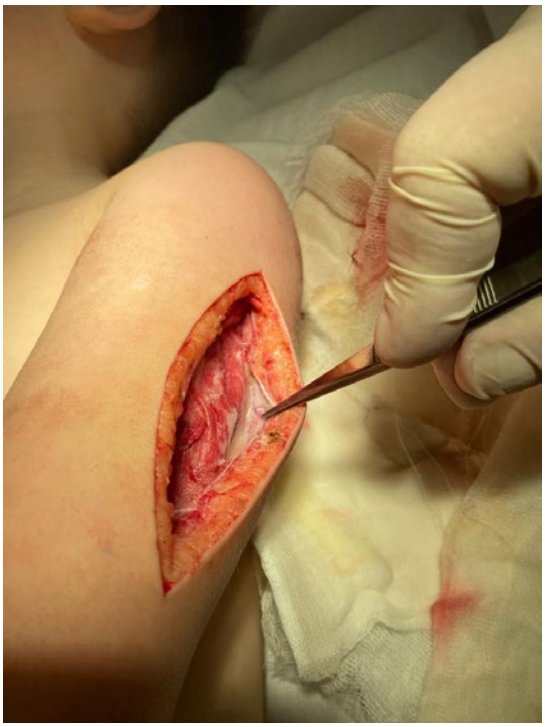

*Fig. 3.* Lampas incision on the left shoulder. Fascial compartments are gray with no bleeding

A skin incision 8 cm long along the internal surface of the shoulder with the opening of the fascial compartments was performed. Complete excision of the altered fascia was conducted. The wounds were treated with a 3 %

hydrogen peroxide solution and were drained with gauze drainages with a 25 % magnesium sulfate solution.

A lampas incision of the skin and superficial fascia along the posterior surface of the right thigh in the projection of the most significant compaction of soft tissues was also performed. Fascia and muscles were whitish in color with no bleeding. A large amount of cloudy liquid was released. Wound toilet, non-viable fascial tissue excision, and gauze drainages with a 25 % magnesium sulfate solution were carried out. Previous antibacterial therapy was changed into imipenem-cilastatin and vancomycin drug therapy.

Effusion microbiological test: Streptococcus pyogenes (Group A) and Cryseobacterium meningosepticum with sensitivity to the prescribed drugs were detected.

Histological examination of the biopsy specimen: focal necrosis and a diffuse, moderately pronounced mixed cell infiltration were revealed.

In the postoperative period, in addition to infusion, antibacterial and immunosupportive therapy, the patient was prescribed the local treatment: the dressings with an ozonized hypertonic magnesium chloride solution and an oil emulsion, including topical treatment with an ozone-nitric oxide gas mixture generated by the Ozotron device with a gas mixture flow rate of 1 L/min and an ozone concentration of 3 g/m$^3$ for 10 minutes daily.

Four days later, a pronounced positive dynamic in both limbs was observed. Fascia and muscles became pink; the wound bleeding was noted. Secondary sutures were placed on the wounds of the left shoulder and the right thigh on the 5th day. The sutures were removed on day 14, and the wounds completely recovered (Fig. 4). The patient was discharged from the hospital on the 28th day in satisfactory condition.

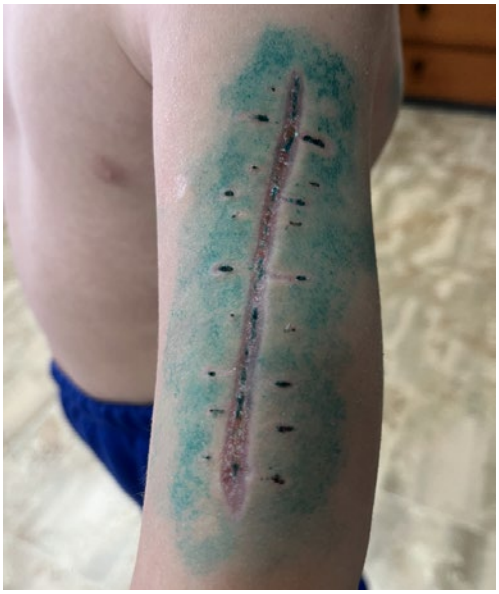

*Fig. 4.* External view of the left shoulder after complete repair

**Conclusion.** The clinical case presented in the article demonstrates a rare pathology observed in children – necrotizing fasciitis. It should be recognized that this pathology can be hidden behind numerous purulent diseases of the skeletal system and soft tissues, significantly complicating the verification process. Only early diagnosis and treatment, including active surgical tactics, allow for avoiding not only a lethal outcome but also extensive soft tissue necrosis followed by skin grafting.

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