Case Report

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Post-traumatic occipital psoriatic plaque complicated by extensive necrotizing fasciitis of the head and neck: a case report and literature review

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Abstract

Necrotizing fasciitis (NF) is a severe infection involving the superficial fascial layers, subcutaneous cellular tissue, and possibly skin. It usually has a fulminant evolution, rapidly leading to death in the absence of early diagnosis and aggressive surgical treatment. We herein report a rare case of NF secondary to a traumatized occipital psoriatic plaque in an alcoholic 47-year-old woman and compare this case with the published literature. The NF extended to the entire scalp, right face, and posterior and lateral cervical region. Despite the initially guarded prognosis, the patient's survival emphasizes the importance of aggressive surgical treatment with wide excision of all necrotic structures without any aesthetic compromise.

Keywords

Necrotizing fasciitis, trauma, psoriasis vulgaris, oral and maxillofacial surgery, psoriatic plaque, infection

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Introduction

The term "necrotizing fasciitis" (NF) was coined by Wilson in 1952.[1] This condition was earlier described by Hippocrates and subsequently compared with "hospital gangrene" by the Confederate Army surgeon Joseph Jones because of its severity, pattern of infection, fulminant progression, and extension along the superficial fascial layers with involvement of the subcutaneous cellular tissue, skin, and underlying muscles.[2,3] NF involving the scalp and cervical and facial region has rarely been described.[4–7] Septic venous thrombosis and thromboangiitis obliterans in the papillary dermis can lead to marked tissue necrosis.[8,9] In patients with improper surgical management of NF, death is induced by progressive organ failure.[10] The etiology of NF varies in the literature; reported causes include dento-periodontal foci[11] associated or unassociated with diabetes mellitus, intravenous drug use and abuse,[12] trauma compromising the skin barrier,[13,14] and postoperative complications or even idiopathic causes.[4,15] Regardless of the causal factor, any type of infection is likely to be worsened by alcoholism, diabetes mellitus, renal failure, malignancy, immunological deficiencies, nutritional disorders such as obesity, increased age, and even metabolic syndrome in young adults.[16] The development of NF on the background of psoriasis vulgaris with or without alcoholism has rarely been reported.[17,18] A multimicrobial pattern of NF with predominance of streptococcal bacteria is more frequent than a monomicrobial pattern, and the prognosis is guarded if the diagnosis is delayed.[10,19–21] Successful surgical treatment must be initiated within the first 24 hours after onset[22,23] to prevent complications such as mediastinitis, aspiration pneumonia, septic shock, or internal jugular vein thrombosis.[9,10]

We herein present a rare case of NF of the scalp with an emphasis on its unusual onset and severe evolution. This case is being reported to make clinicians aware of the extreme importance of rapid diagnosis and treatment to prevent death in patients with NF. Presentation of this case was approved by the Ethics Committee of the Clinical Emergency County Hospital. The patient consented to the reporting of her case, and the authors respected her confidentiality by using anonymous information and pictures that do not expose the patient's facial features.

Case report

A 47-year-old Caucasian woman with a 26-pack-year history of cigarette smoking, 10-year history of consumption of more than 1 glass of alcohol per day, and untreated chronic psoriasis vulgaris was found unconscious on the floor of her house in May 2017. She had been previously treated at a regional hospital with meropenem (intravenous infusion of 1 g powder for solution every 12 hours for 2 days). Interhospital transfer to the Oral and Maxillofacial Surgery (OMFS) Clinic of Cluj Napoca, Romania was performed for evaluation and treatment of an extensive infection of an occipital excoriated psoriatic plaque. Upon admission to the OMFS department, the patient had a normal temperature, tachypnea, tachycardia, hypotension, tumefaction in the right area of her face and neck, bilateral palpebral microabscesses, a large occipital psoriatic plaque of 10×7 cm, and massive crepitations in the occipital and posterior cervical regions (Figure 1). Within 1 hour, emergency surgery was performed and involved a wide posterior cervical incision from the contralateral margin of the trapezius muscle to the right lateral cervical region, extending along the anterior margin of the right sternocleidomastoid muscle. This was complemented by a right submandibular incision from the right mastoid process to the mental region.

Extensive necrosis affected the occipital epicranial galea, posterior cervical fascia, and right superficial cervical fascia from the right temporozygomatic arch to the superior border of the right clavicle (Figure 2(a)).

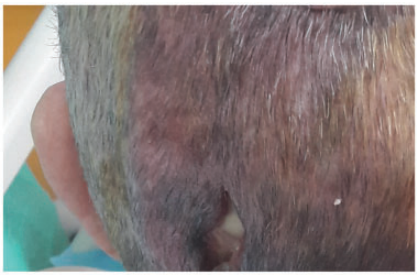

Figure 1. First postoperative day – Clinical appearance of the occipital psoriatic plaque after the initial posterior cervical incision.

We performed wide excision, applied a sterile dressing, and carried out extensive washing with oxygenated water and povidone-iodine solution. A postoperative contrast-enhanced computed tomography scan revealed no additional fluid or gas collections in the superficial fascial layer or deep cranial, facial, and cervical layers. After 3 days of empirical antibiotic therapy (vancomycin 1000 mg, imipenem 500 mg, and metronidazole 500 mg powder for solution, infused intravenously every 12 hours), we performed a limited right lateral cervical and supraclavicular necrectomy with complete excision of the platysma muscle, partial excision of the lateral cervical skin flap, total necrectomy of the splenius capitis muscles, and partial necrectomy of the

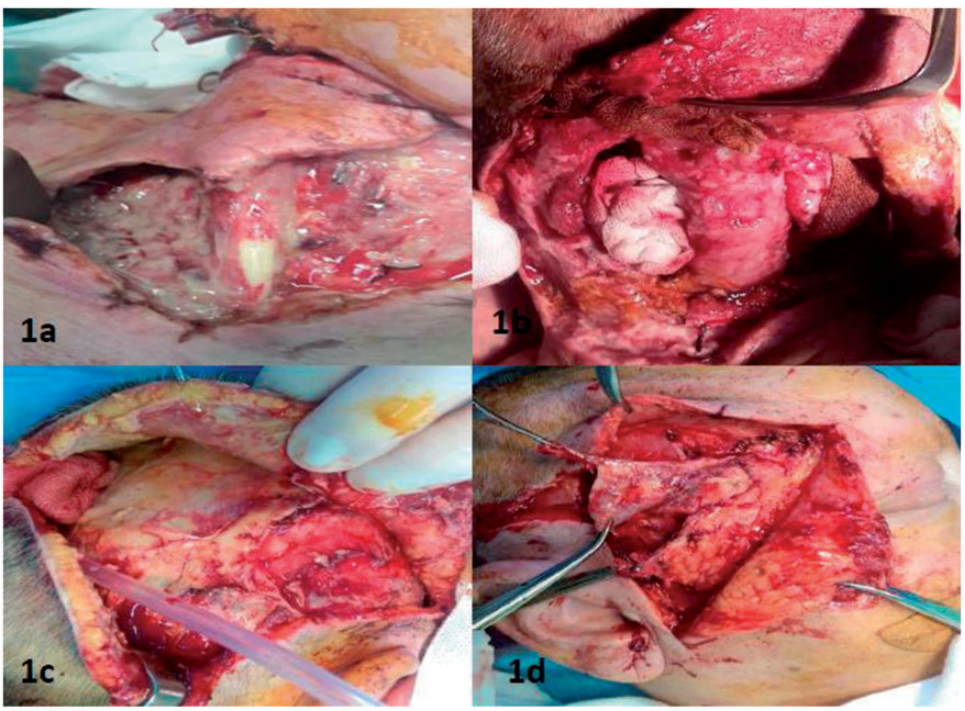

Figure 2. Intraoperative view. (a) Superficial necrotic area of the right sternocleidomastoid muscle and right supraclavicular fossa. (b) The two semispinalis muscles after excision of the superficial splenius capitis muscles as well as the interstitium between these muscles after excision of the posterior cervical line. (c) Necrectomy of the epicranial galea. (d) Necrectomy of the right temporal fascia.

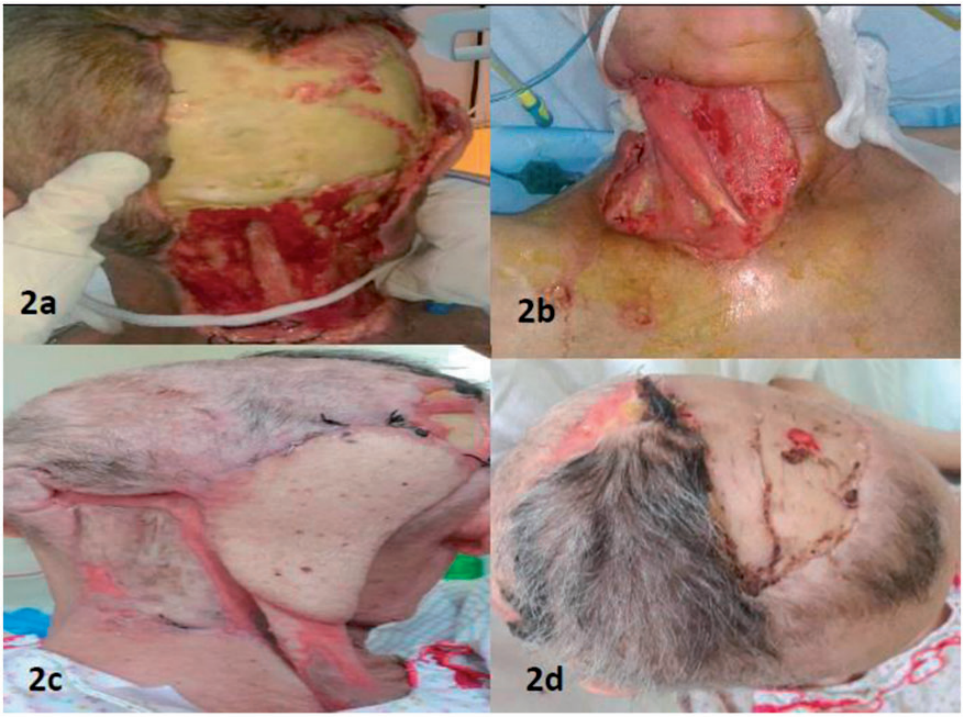

Figure 3. (a, b) Final outcome of the scalp and posterior cervical and laterocervical regions with secondary granulation prior to plastic reconstruction. (c) Final outcome of reconstruction of the occipital scalp and posterior cervical region with a trapezius muscle flap. (d) Final outcome of reconstruction of the laterocervical region with a free skin graft.

semispinalis capitis muscles (Figure 2(b)). The postoperative outcome was favorable in the right face and lateral and cervical regions despite leukocytosis (11.000×10^3/dL) and fever (38.8°C). Three days later, bacteriological wound drainage and drug sensitivity testing showed *Staphylococcus epidermidis*, *Klebsiella* sp., and *Acinetobacter* sp. with sensitivity limited to colistin. The patient was therefore treated with colistin administered as an intravenous injection of 3 million IU every 8 hours in association with the previous antibiotics. On postoperative day 7, the patient's entire face became edematous, and we performed necrectomy of the entire epicranial galea (Figure 2(c)) and right temporal fascia (Figure 2(d)). On postoperative day 45, the patient had clean wounds with granulation tissue in the right lateral cervical and posterior cervical regions (Figure 3(a)) and a persistent area of denuded skull bone in the occipital and right temporal and parietal regions (Figure 3(b)). Plastic reconstruction was necessary and consisted of multiple reconstructions with flaps (pedicled trapezius musculocutaneous and rotated scalp flaps) and two free skin grafts (Figure 3(c), (d)). The patient was transferred to the Plastic Surgery Department for surveillance and subsequently discharged on hospitalization day 76.

Discussion

NF most frequently affects the abdomen and limbs.[24] NF of the head and neck is rare;[5–7,9,11,12,25,26] it is a hidden[27] but not

forgotten disease,[28] such as tuberculosis of the oral cavity.[29] In such cases, the impact of immunosuppression caused by psoriasis,[17] herpes zoster,[27] alcoholism,[18] uncontrolled diabetes mellitus, and chronic renal failure must be considered. Correct diagnosis of NF is frequently difficult because it can mimic soft tissue cellulitis, erysipelas, or lymphedema.[27] This confusion often leads to inadequate, less aggressive treatment and delayed intervention (>48 hours), increasing the mortality rate to 50%,[2,10] especially in cases involving interhospital transfer.[30] From a microbiological viewpoint, NF is classified into four main types.[31] Type I is generally plurimicrobial, characterized by the combination of aerobic with at least one anaerobic or facultative anaerobic species with synergistic virulence between them.[32] Type II is a monomicrobial infection most frequently caused by group A *Streptococcus pyogenes*.[33] Type III is a rare type of infection caused by marine *Vibrio* spp. secondary to fish bites or injuries exposed to salt water.[34] Finally, type IV is caused by fungal agents, especially *Candida* spp. in immunocompromised patients and *Zygomycetes* spp. in immunocompetent patients.[34] Microbiological observations[35] have revealed a frequent monomicrobial pattern of NF (type II with group A *Streptococcus*) localized to the head and neck region.[19,20] In the present case, the type I NF with polymicrobial infection was related to neglected trauma and an underestimated infection of a psoriatic plaque. Type I NF is rarely encountered at the level of the cephalic extremity, which increased the complexity of the present case.[35] Infection of a psoriatic lesion is extremely rare because of the excessive production of antimicrobial peptides (AMPs) by psoriatic keratinocytes.[36] AMPs are known for their role in destroying bacteria, fungi, viruses, and other microorganisms with a protective role for infection in psoriatic lesions.[36] However, the antimicrobial effect of AMPs only manifests if the skin in the are of the psoriatic plaque is intact and nontraumatized and lacks open wounds.[37] The presence of wounds at this level represent entrance gates for microorganisms, thus facilitating infection of the region; this may explain the onset of NF in the psoriatic occipital lesion in our case.[37] Our success in this patient's treatment was due to repeated aggressive surgical procedures performed whenever necessary, with no compromise in the favor of her aesthetic appearance. Aggressive surgical treatment of NF is unanimously accepted worldwide.[38–40] No hyperbaric oxygen therapy was administered in our case. Although some authors recommend it, its efficiency in the treatment of NF remains inconclusive.[17,41] Plastic reconstructions depend on the size and topographic location of NF and may include free skin grafts with vacuum-assisted closure dressing.[42] We performed a special intervention involving the use of a pedicled trapezius musculocutaneous flap and free skin graft (Figure 3(c), (d)). NF of the head and neck remains a disease with a guarded prognosis. A multidisciplinary approach involving other specialties (microbiology, pulmonology, and intensive care) is required to achieve an optimal therapeutic success rate.

In conclusion, rapid diagnosis and surgical therapy of NF are crucial for patient survival. Despite the occurrence of a rare type of NF secondary to a neglected multimicrobial infected occipital psoriatic plaque after minor trauma, aggressive surgery with no compromise in favor of the patient's aesthetic appearance followed by plastic reconstruction were successfully performed in a 47-year-old alcoholic woman.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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