

## Conservative management of streptococcal necrotizing periorbital fasciitis following primary VZV infection

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**SUMMARY: Conservative management of streptococcal necrotizing periorbital fasciitis following primary VZV infection.**

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*A 45-year old male patient, with a past history of illicit drug abuse and hepatitis C, presented with a 2 day history of worsening eyelid edema. Examination of the globe was impossible due to eyelid fusion caused by extensive soft tissue damage. Based on the examination, a diagnosis of necrotic fasciitis secondary to VZV infection was*

*made. The patient received empirical treatment with intravenous acyclovir, meropenem and vancomycin. CT imaging demonstrated no ocular involvement. Lesions were cultivated, revealing presence of Streptococcus pyogenes. Intravenous clindamycin was added to his course. Improvement was gradually observed. The patient received treatment for a total of 21 days, resulting in excellent final outcome. His final visual acuity was 0.9 on a Snellen chart, without signs of ocular inflammation. No surgical intervention was required and lesions fully healed with conservative management. Clinical outcomes depend on prompt treatment initiation, whilst delay in the diagnosis can prove fatal.*

KEY WORDS: Fasciitis - Varicella zoster virus - Infection - Necrosis - Surgical debridement.

### Introduction

Periorbital necrotizing fasciitis is a severe, rare and potentially lethal condition of the face. It is defined as a rapidly extensive necrosis of the superficial fascia to the deeper planes (1). Infection can rapidly spread in adjacent tissues along the fascial planes leading to necrosis of subcutaneous substance and high mortality rates (30-60%) (2, 3). The periorbital fascia is a relative uncommon region to harbor the infection (4), while most cases are associated with immunosuppression, trauma or post-operational exposure (5, 6). However, it was found that in 27.8% of all cases, no triggering incident is found (4). It is

often suggested that aggressive treatment with intravenous antibiotics and extensive surgical debridement is critical for favorable clinical outcomes (5). In this report we present an interesting case of necrotic soft tissue infection from Streptococcus pyogenes after primary infection of varicella zoster virus (VZV), which was treated only with intravenous agents without the need of surgical debridement or reconstruction

### Case presentation

A 45-year old male patient with a background of heroin abuse, smoking habit and chronic hepatitis C, was referred to our department because of a 2-day history of left eyelid edema. Physical examination showed an extensive area of left eye periorbital soft tissue necrosis, as well as area of shingles, with elevated lesions of crusts and scabs at the distribution

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of the ophthalmic branch of the left trigeminal nerve (V1) (Figure 1). Slit lamp examination revealed erosions involving both the upper and lower eyelids. Eye examination was not possible at that time due to extensive damage, resulting in edematous and relatively fused eyelids. On admission, blood tests revealed slight leukocytosis (11700 WBC/mm<sup>3</sup>), with no neutropenia, and a mildly elevated C-reactive protein of 33.3 mg/l. CT of the head demonstrated subcutaneous and orbital fat infiltration, with no obvious sign of ocular involvement. Based on the clinical findings a diagnosis of necrotizing soft tissue infection, secondary to primary VZV infection was made.

After samples for blood cultures were taken from the necrotic areas, the patient was rapidly commenced on antiherpetic and broad-spectrum antibiotic treatment. This entailed a combination of intravenous acyclovir, with an empirical antibiotic regime of meropenem and vancomycin. The patient

was subsequently referred to the plastic surgery department, where it was deemed appropriate to postpone surgical debridement, as conservative observation would potentially reveal a clear zone of demarcation (7). The antibiotic course was carried out throughout the patient's hospital stay. Daily wound care was performed by irrigation using an ophthalmic Betadine solution.

Blood results on day 3 of patient's hospitalization, demonstrated a decrease in the C-reactive protein value (3.02 mg/l). Biochemical analysis was unremarkable and testing for human immunodeficiency virus (HIV) proved to be negative. Lesions were cultivated, revealing the presence of *Streptococcus pyogenes*. Intravenous clindamycin was thus added to the patient's therapy. On the 9th day of admission, examination of his eye became possible owing to a marked improvement in his clinical appearance (Figure 2). His best-corrected visual acuity was 20/25 on a Snellen chart. Ocular motility was nor-



**Figure 1 - Clinical presentation with severe periorbital necrosis and eyelid fusion before treatment initiation.**



**Figure 2 - Improvement was profound at day 9 of intravenous antibiotic therapy.**



**Figure 3 - Fully healed skin lesions with complete eyelid closure after 21 days.**

mal without diplopia. The corneal epithelium was intact and no hypopyon was seen. Fundus examination reveal no significant pathology.

Overall, the patient received intravenous antibiotics for 21 days, and was discharged with excellent esthetic and functional results (Figure 3). No surgical reconstruction was required.

## Discussion

Necrotizing fasciitis is a rapidly progressing, severe infection of the superficial fascia, which, if left untreated carries a high risk of morbidity and mortality. It is often associated with vascular thrombosis, subcutaneous tissue destruction and necrosis of the overlying skin. The most common organisms involved in eyelid necrosis are *Streptococcus pyogenes* and *Staphylococcus aureus* and less commonly, fac-

ultative and anaerobic microorganisms (8).

No standard protocol exists on how to best manage periorbital necrotizing fasciitis. An aggressive multimodal approach is often required consisting of extensive surgical debridement of the compromised tissues along with broad-spectrum antibiotic treatment. It is suggested that, because of the risk blood vessel thrombosis, antibiotics may not be effective in the infected area. Thus, surgical debridement may allow better penetration of drugs and limit the bacterial load (5). However, in the aforementioned case, our patient who was afflicted with severe eyelid necrosis, was treated conservatively, requiring only antiviral and antibiotic therapy. He demonstrated an excellent clinical outcome 21 days later. The eyelids tend to be resistant to infection because of their rich vascular supply (9). Their unique anatomy allow for a delay in debridement (10), since systemic antibiotics have better access to infected areas. Therefore, patients with uncomplicated periorbital necrotizing fasciitis can be treated with conservative management only, and necrotic tissue may be debrided if the condition persists (7).

It should be noted that, empirical therapy is mandatory while waiting for species cultivation and identification, since timing of treatment initiation is the most crucial factor for patient outcome (11). Once a species is identified, antibiotics regime can be tailored accordingly. Additional treatment options have been described, such as negative pressure wound therapy and hyperbaric oxygen therapy, but their use remains controversial (12). Necrotizing fasciitis should be differentiated from preseptal cellulitis, orbital cellulitis and cavernous sinus thrombosis.

To conclude, a prompt therapeutic approach with parenteral antibiotics is paramount for an optimal clinical outcome and cosmetic result. All patients should be monitored closely, to identify signs of improvement and surgical debridement should be reconsidered in cases of delayed response to antibiotic therapy. Report of this case was approved by the Institutional Review Board of Korgialenio Benakio General Hospital and followed by the principles of the Declaration of Helsinki.

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Written informed consent was obtained from the patient for publication of this case report and ac-

companying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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