



DOI: 10.14744/eer.2025.66588
Eur Eye Res 2025;5(3):272–275

EUROPEAN
EYE
RESEARCH

CASE REPORT

Post-traumatic orbital cellulitis and eyelid necrosis

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Abstract

We report a case of periorbital and orbital cellulitis following trauma, resulting in left upper eyelid necrosis. The infection was treated with broad-spectrum systemic antibiotics, debridement, and drainage of the abscess. Early treatment can prevent complications such as blindness, aesthetic problems, and systemic involvement.

Keywords: Eyelid necrosis; orbital cellulitis; post-trauma; necrotizing cellulitis.

Periorbital (preseptal) cellulitis refers to an infection localized in the soft tissues anterior to the orbital septum, whereas orbital (postseptal) cellulitis involves infection of tissues posterior to the orbital septum. Cellulitis can affect individuals across all age groups.^[1]

Dacryocystitis, eye surgeries, paranasal sinusitis, trauma, and intraorbital foreign bodies are the main causes of orbital cellulitis.^[1,2] Infections such as otitis, pneumonia, and dental infections that cause bacteremia can also cause orbital cellulitis through hematological spread.^[1]

The purpose of this case report is to describe a rare instance of necrotizing orbital and periorbital cellulitis following trauma, to discuss the management approach employed, and to highlight the importance of early intervention to prevent potential complications. This report aims to contribute valuable insights into the clinical approach to such infections, guiding ophthalmologists and other healthcare professionals.

Case Report

A 40-year-old male patient was admitted to the emergency department of our tertiary care center in October 2023. He initially did not report significant swelling or redness of the left upper eyelid, which had progressively worsened. The patient also reported pain in his left shoulder and hand. The incident leading to his admission involved a fall from a cliff after consuming alcohol, during which he lost consciousness and remained unconscious for approximately twelve hours. He was found five days after the fall and subsequently admitted to the hospital. The patient was unable to recall the events surrounding the trauma and, therefore, could not provide specific details regarding his state of consciousness, the circumstances of the fall, or the exact height of the fall. Informed consent for research, medical evaluation, and treatment was obtained from the patient.



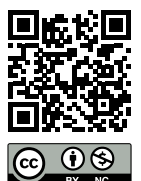
Cite this article as: Irdem F, Taskiran Comez A. Post-traumatic orbital cellulitis and eyelid necrosis. Eur Eye Res 2025;5(3):272–275.

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Submitted Date: 12.01.2025 **Revised Date:** 26.06.2025 **Accepted Date:** 09.07.2025 **Available Online Date:** 17.12.2025

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Findings

At presentation, the left upper lid was observed to be necrotic, covered with dense secretions and black crusts (Fig. 1).

Best-corrected visual acuity (BCVA) was 1.0/0.2. Eye movements were limited in all directions, and light reflexes were normal. Bilateral corneas were transparent, and globe integrity was preserved. The fundus could not be evaluated due to chemosis secondary to trauma and intense edema in the upper eyelid of the left eye. Ocular ultrasound was performed, and no retinal pathological finding was detected. After tetanus prophylaxis, the patient was transferred to the ophthalmology service from the emergency department. At the time of presentation, laboratory tests showed an elevated white blood cell (WBC) count of 13,090/ μ L and a C-reactive protein (CRP) level of 74 mg/L. Without considering lid reconstruction, the infected eyelid was debrided until vital tissue was observed (Fig. 2). Before antibiotic therapy, a sample was taken from the wound site for direct examination, culture, and Gram staining. The collected sample confirmed the presence of methicillin-sensitive *Staphylococcus aureus* (MSSA).

Orbital computed tomography (CT) and magnetic resonance imaging (MRI) were performed. The imaging findings were compatible with left orbital cellulitis without meningeal involvement.

The patient was referred to the infectious diseases department. Vancomycin 3 \times 1 g and piperacillin-tazobactam 3 \times 4.5g were started intravenously. Vancomycin was chosen to cover MRSA, a common pathogen in severe soft tissue infections such as orbital cellulitis, while piperacillin-tazobactam was used for its broad-spectrum coverage against Gram-positive, Gram-negative, and anaerobic organisms. Topical povidone-iodine, dexpanthenol, mupirocin, and rifampicin (synergistic effect in combating MSSA) treatments were applied.^[3-5] On the eighth day, the infection symptoms had regressed.

He was discharged with local and systemic antibiotics and lubrication. In the second month, the debridement area was observed to heal by secondary intention, with minimal lagophthalmos (Figs. 3 and 4). No epitheliopathy was observed in the cornea or conjunctiva. Apart from lubrication therapy, no additional treatment or surgery was considered.

Discussion

Eyelids tend to be resistant to infections because of their rich vascular bed; however, they are prone to necrosis due to their underlying anatomy.^[6-8] The thinness of the eyelid skin and the absence of subdermal fatty tissue facilitate



Fig. 1. At presentation, the left upper lid was observed to be necrotic, covered with dense secretions and black crusts.



Fig. 2. The left eyelid was debrided until vital tissue was observed.



Fig. 3. Minimal lagophthalmos at the 6th-month follow-up.

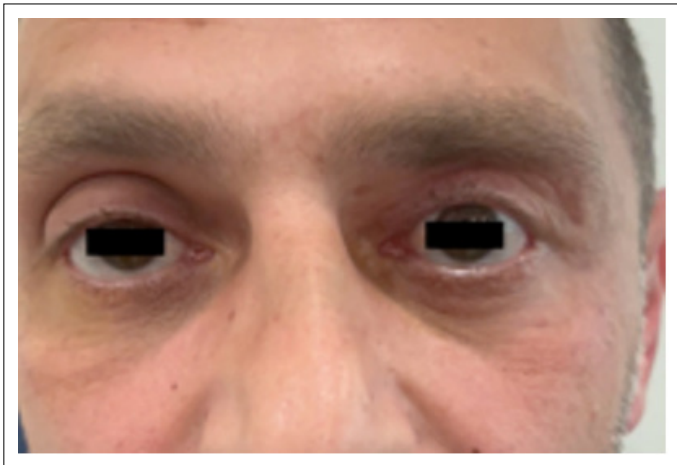


Fig. 4. Minimal lagophthalmos at the 6th-month follow-up.

inflammatory edema secondary to infection. The resulting edema prevents vascularization and causes skin necrosis.^[9,10] Eyelid necrosis can cause cosmetic and functional problems.^[11] Orbital CT and MRI are required for the diagnosis and follow-up of cellulitis. The most important diagnostic tools in determining the causative agent of cellulitis are blood and wound cultures. Samples should be collected before starting antibiotic therapy.^[1] If there is a wound or purulent discharge in the affected eye, as in our case, samples should also be obtained from those areas.

At the time of presentation, it is crucial to assess the WBC and CRP levels. These elevated markers indicate a severe systemic inflammatory response, suggesting that the infection had become significant and widespread. The high WBC count is indicative of an active bacterial infection, while the elevated CRP level reflects the extent of tissue inflammation and ongoing infection. These results were crucial in guiding the decision to initiate broad-spectrum intravenous antibiotics and prompted close monitoring for potential complications, including the risk of systemic involvement or progression to a more severe infection, such as sepsis.

The most common cause of cellulitis is sinusitis. The most frequently detected agents are *Staphylococcus aureus*, *Streptococcus pyogenes*, *H. influenzae*, *Streptococcus pneumoniae*, and anaerobic bacteria.^[12] The most common agents due to disruption of skin integrity, as in our case, are *S. aureus* and *S. pyogenes*.^[13]

Complications may occur due to untreated or advanced-stage cellulitis. In some cases, the infection can progress to the central nervous system. It may cause central nervous system pathologies such as meningitis and brain or subdural abscesses. The optic nerve may be affected, resulting in decreased visual acuity.^[12] Prompt surgical debridement and empirically initiated broad-spectrum antibiotic

treatment are critical in necrotizing cellulitis. Debridement allows local antibiotics to penetrate better under the skin and limits the bacterial load. In cases of extensive tissue loss, reconstruction of the debrided area with a graft or flap should not be considered before treating the infection. The debrided area should be left for secondary healing. However, ectropion, exposure keratopathy, and contractures may develop due to secondary healing. Reconstructive surgeries, such as partial- or full-thickness skin grafts and Z-plasty, depending on the involved side, should be considered for secondary healing complications.^[7,9,10] In our case, surgery for the anterior lamella was not considered because there was minimal lagophthalmos after secondary healing, and the cornea was transparent with lubrication.

Conclusion

Orbital cellulitis should be treated promptly, and patients should be hospitalized. The most important tools in determining the causative agent are wound and blood cultures taken before antibiotic administration. Before reconstruction, necrotic tissue should be completely debrided. Systemic and topical antibiotics should be administered until the infection resolves. Due to the risk of infection and graft loss in the early period, the debrided area should be left to heal by secondary intention. If necessary, reconstruction of the anterior lamella should be evaluated at a later stage. In some patients, almost complete secondary recovery can be observed without the need for additional surgery, as seen in our case.

Informed Consent: Written informed consent was obtained from the patient for the preparation of this work.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept: F.I., A.T.C.; Design: F.I., A.T.C.; Supervision: F.I., A.T.C.; Resource: F.I., A.T.C.; Materials: F.I.; Data Collection and/or Processing: F.I.; Analysis and/or Interpretation: F.I., A.T.C.; Literature Search: F.I., A.T.C.; Writing: F.I.; Critical Reviews: A.T.C.

Conflict of Interest: None declared

Use of AI for Writing Assistance: Not declared.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Çitçi E, Oygar P, İnce E, Doğru Ü. Periorbital ve orbital sellülitin ampicilin sulbaktam ile tedavisi. *Ankara Üniversitesi Tıp Fakültesi Mecmuası* 2002;55:265– 70. [\[CrossRef\]](#)
2. Shinagawa Y, Ando I, Kukita A, Kitazawa E, Saruki K, Aoki M. Cellulitis of the eyelids associated with sinusitis and brain

- abscess. *J Eur Acad Dermatol Venereol* 1998;11:74–7. [\[CrossRef\]](#)
3. Wang YC, Tseng HM. Necrotizing soft tissue infections: an overview of the management of severe infections. *J Clin Med* 2017;6(2):15–22.
 4. Tunkel DE, Gaughan JP. Empiric antimicrobial therapy for orbital and periorbital infections. *Clin Infect Dis* 2013;56(2):252–7.
 5. Sivak-Callcott JA, Dunbar RM. Antibiotic therapy in periorbital and orbital infections. *Ophthalmol Clin North Am* 2012;25(4):583–90.
 6. Dhariwal DK, Kittur MA, Farrier JN, Sugar AW, Aird DW, Laws DE. Post-traumatic orbital cellulitis. *Br J Oral Maxillofac Surg* 2003;41:21–8. [\[CrossRef\]](#)
 7. Einarsson OJ, Pers M. Streptococcal gangrene of the eyelids. Case reports. *Scand J Plast Reconstr Surg* 1986;20(3):331–5. [\[CrossRef\]](#)
 8. Placik OJ, Pensler JM, Kim JJ, Mets MB, Engel JM. Necrotizing periorbital cellulitis. *Ann Plast Surg* 1993;31(4):369–71. [\[CrossRef\]](#)
 9. Hill J, Alun-Jones T. Eyelid necrosis complicating acute maxillary sinusitis. *J Laryngol Otol* 1989;103(4):413–4. [\[CrossRef\]](#)
 10. Rosenthal WN, Gore HL, Insler MS. Periorbital necrotizing fasciitis. *Ann Ophthalmol* 1987;19(11):426–7.
 11. Raja V, Job R, Hubbard A, Moriarty B. Periorbital necrotising fasciitis: delay in diagnosis results in loss of lower eyelid. *Int Ophthalmol* 2008;28(1):67–9. [\[CrossRef\]](#)
 12. Powell KR. Orbital and periorbital cellulitis. *Pediatr Rev* 1995;16:163–7. [\[CrossRef\]](#)
 13. McBride TP, Davis HW, Reilly JS. Otolaryngology. In: Zitelli BJ, Davis HW (Eds.). 3th Ed. *Atlas of Paediatric Physical Diagnosis*, St. Louis: Mosby-Wolfe, 1997. p. 683–728.