

CASE REPORT

## A rare complication of endoscopic sinus surgery: necrotizing fasciitis of the eyelid

Endoskopik sinüs cerrahisinin nadir bir komplikasyonu: Gözkapağı nekrotizan fasiiti

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Necrotizing fasciitis is a soft tissue infection characterised by necrosis of fascia and subcutaneous tissue. It frequently involves the groin, abdomen and lower extremities, but rarely involves the head and neck region. An unusual occurrence of periorbital necrotizing fasciitis after a routine endoscopic sinus surgery in a 57-year-old woman with a history of type II diabetes mellitus is presented. Although the disease is very rare, all the physicians should be aware of the manifestations of this disorder and its treatment. Early recognition and prompt intervention plays an important role in minimizing the morbidity and mortality rates.

**Key Words:** Eyelid diseases/pathology/etiology; fasciitis/pathology; paranasal sinuses/surgery/endoscopy/complications.

Nekrotizan fasiit cilt altı doku ve fasyanın nekrozu ile kendini gösteren bir yumuşak doku enfeksiyonudur. İngüinal bölge, karın ve alt ekstremitelerde daha sık rastlansa da, baş ve boyun bölgesinde de nadiren görülür. Tip II diabetes mellitus öyküsü olan ve endoskopik sinüs cerrahisi yapılmış 57 yaşındaki bir kadın hastada periorbital nekrotizan fasiit olgusu sunuldu. Hastalık nadir görülse de tüm hekimlerin bu hastalığın belirtileri ve tedavisi hakkında bilgi sahibi olmaları gerekir. Erken tanı ve zamanında müdahale, morbidite ve mortalite oranlarını azaltmada önemli rol oynar.

**Anahtar Sözcükler:** Gözkapağı hastalıkları/patoloji/ etyoloji; fasiit/patoloji; paranasal sinüsler/cerrahi/ endoskopi/ komplikasyon.

Necrotizing fasciitis was first reported by Fournier in 1883 as idiopathic scrotal gangrene, although the full clinical entity was not described until 1924 by Meleney.<sup>[1]</sup> In 1952 Wilson introduced the term necrotizing fasciitis.<sup>[2]</sup> The disorder is a progressive, potentially fatal, rapid necrotizing infection of the subcutaneous tissues and fascia that generally follows minor trauma to the lower extremities, with head and neck involvement being extremely rare.<sup>[3]</sup>

Orbital and periorbital infections may be caused by a variety of bacterial, fungal and parasitic agents. The close anatomic relationship shared by the orbits, paranasal sinuses and facial venous system makes early diagnosis essential to prevent the potentially devastating consequences of orbital infection.<sup>[4]</sup> The most common cause of orbital cellulitis is direct extension of an infection from the paranasal sinuses, particularly the ethmoidal system.<sup>[5]</sup> The thinness of this bone in the lateral wall of the ethmoidal

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labyrinth may contribute to the direct extension of infection into the orbit.<sup>[6]</sup>

We present an extremely unusual case of necrosis of the eyelid skin in a female patient who underwent endoscopic sinus surgery.

### CASE REPORT

A 57-year-old woman with history of type II diabetes mellitus was examined because of rapidly progressive swelling of both left upper and lower eyelids. She had undergone endoscopic sinus surgery because of maxillary and ethmoidal sinusitis. She had been evaluated postoperatively by the surgeon and prescribed oral sulbactam+ampicillin.

On examination seven days after the endoscopic sinus surgery, the patient was very ill, weak, non ambulant, with a body temperature of 39°C and blood pressure of 100/60 mmHg. Induration and necrosis was noted over both left upper and lower lids. Dark yellow and foul smelling pus was discharging from the wound and cords of necrotic tissues were present under the skin. The left upper eyelid was ptotic and purulent discharge was noted within the conjunctival fornices. Induration and edema extended to the right periorbital region and face (Fig. 1a).

Ophthalmic examination disclosed visual acuity in the left eye to be 6/20 and, in the right eye to be 10/20. Slit lamp examination revealed a fine corneal edema with active inflammation in the left anterior chamber. Ophthalmoscopic examination showed normal optic nerves and no diabetic retinopathy. Intraocular pressure were bilaterally normal.

Conjunctival and wound swabs were taken. Laboratory investigations revealed a white cell count

of 20000/mm<sup>3</sup>. Blood glucose level was 300 mg/dL. Gram stain of the purulent discharge disclosed gram-positive cocci. Wound and conjunctival cultures yielded *Streptococcus pyogenes* sensitive to penicillin and clindamycin. Blood cultures were negative.

Initial treatment included intravenous fluid and electrolyte therapy, management of diabetes mellitus and intravenous therapy with high-dose penicillin G (4,000,000 units every 6 hours) and clindamycin (600 mg every 8 hours). Ofloxacin eyedrops were also initiated. Surgical debridement was performed to remove the affected skin, subcutaneous tissue, fascia, and all other necrotic tissues. The ectropion of the left lower eyelid was initially managed with pomade and tarsorrhaphy. After two weeks of saline dressing changes, the wound was once again debrided and covered with a full-thickness retroauricular skin graft. Final evaluation after four months, demonstrated no significant deformity except the mild ptosis (Fig. 1b). Visual acuity did not change.

### DISCUSSION

Necrotizing fasciitis is an uncommon, severe, and potentially fatal bacterial infection involving the subcutaneous soft tissue, particularly the superficial and deep fascia with a mortality rate approaching 30%. Mortality results from a fulminant course that may lead to septic shock, respiratory distress syndrome, and renal failure.<sup>[7]</sup> Necrotizing fasciitis typically occurs in the setting of trauma. Poor prognostic factors include extensive involvement, delayed treatment, immunosuppression, malnutrition, advanced age, diabetes mellitus, and peripheral vascular disease.<sup>[8]</sup> The most frequent sites of involvement include the extremities, abdominal wall, groin, and perioral

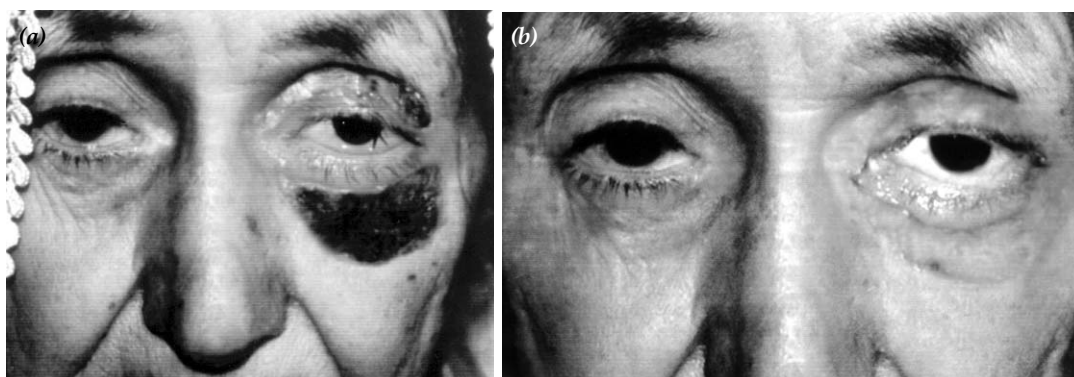


Fig. 1 - (a) Appearance of the wound site seven days after endoscopic sinus surgery. (b) Four months later, post-operative view of the patient.

area, as well as postoperative wound sites.<sup>[9]</sup> Extensive necrosis of the superficial fascia with widespread undermining of surrounding tissues and secondary gangrene of the overlying skin characterize the disease. These infections are caused by a variety of microorganisms, including aerobic and anaerobic gram-positive and gram-negative bacteria.<sup>[7]</sup> Necrotizing fasciitis in our patient seemed to have been precipitated by old age, type II diabetes mellitus, and the traumatic effect of endoscopic sinus surgery. Infection in this patient is caused by *Streptococcus pyogenes*.

In the early stages of this condition the patient was being treated with oral antibiotics because of a soft tissue infection with a benign superficial appearance. This was due to the fact that relative mild external clinical signs masked the underlying necrosis. However, the antibiotics together with a relatively mild surgical debridement could not eradicate the infection. The delay in instituting appropriate chemotherapy led to rapid involvement of subcutaneous tissue. The patient was initially treated with sulbactam+ampicillin. Later therapy was changed to intravenous penicillin G, and clindamycin. Penicillin remains the drug of choice for group A streptococcal infections. Substantial resistance to penicillin has not been detected in isolates of group A streptococci even after five decades of use for this pathogen.<sup>[10]</sup> Oral antibiotics are inadequate.<sup>[11]</sup> Initially, broad spectrum empiric antibiotics should be administered parenterally before definitive culture results.<sup>[2]</sup> As culture results are received, the antibiotic regimen may be refined. Typically as seen in this patient surgical elevation of the skin edges, debridement, and vigorous irritation of the wound precipitates the improvement in the patient's condition.

As periorbital cellulitis may be complicated by involvement of the central nervous system, cavernous sinus thrombosis, or decreased visual acuity (secondary to optic nerve compression or increased intraocular pressure) patients should be evaluated by an ophthalmologist on admission.<sup>[12]</sup>

In general, the eyelids tend to be resistant to infection because of their rich vascular supply. However, in patients with uncontrolled infection, the susceptibility of the eyelid to necrosis is attributable to the underlying anatomy.<sup>[11]</sup> The lack of subdermal adipose tissue plus the tenuous attachment of the thin skin to the underlying structures permits accumulation of blood or inflammatory edema sec-

ondary to infection to distend subcutaneous space. This results in impaired capillary blood flow producing skin necrosis similar to the process observed in Meleney's gangrene.<sup>[2]</sup>

Ectropion and contracture are the natural sequelae when the wounds are allowed to heal by contraction and secondary intention. Patients with eyelid necrosis may develop epicanthal folds or cicatricial ectropion requiring reconstructive procedures consisting of split-thickness or full-thickness skin grafts or Z-plasties.<sup>[2,11]</sup> We prefer early surgical debridement and tarsorrhaphy in addition to systemic antibiotics and local wound care to develop a clean wound, and apply a retroauricular full-thickness skin graft.

Despite the successful treatment, it is important to note that patients may remain with periorbital scars, thereby suffering emotionally and socially. Early recognition and aggressive management are paramount with this potentially fatal condition.

## REFERENCES

1. Ray AM, Bressler K, Davis RE, Gallo JF, Patete ML. Cervicofacial necrotizing fasciitis. A devastating complication of blepharoplasty. Arch Otolaryngol Head Neck Surg 1997;123:633-6.
2. Rosenthal WN, Gore HL, Insler MS. Periorbital necrotizing fasciitis. Ann Ophthalmol 1987;19:426-7.
3. Spankus EM, Flint PW, Smith RJ, Miller RH. Craniocervical necrotizing fasciitis. Otolaryngol Head Neck Surg 1984;92:261-5.
4. Jayamanne DG, Bell RW, Allen ED. Orbital cellulitis: an unusual presentation and late complication of severe facial trauma. Br J Oral Maxillofac Surg 1994;32:187-9.
5. Bergin DJ, Wright JE. Orbital cellulitis. Br J Ophthalmol 1986;70:174-8.
6. Mills RP, Kartush JM. Orbital wall thickness and the spread of infection from the paranasal sinuses. Clin Otolaryngol 1985;10:209-16.
7. Schwartz WN. Cellulitis and subcutaneous soft tissue infections. In: Mandel GL, Bennett JE, Dolin R, editors. Mandel, Douglas and Bennett's principles and practices of infectious disease. 4th ed. New York: Churchill Livingstone; 1995. p. 909-29.
8. Bisno AL, Stevens DL. Streptococcal infections of skin and soft tissues. N Engl J Med 1996;334:240-5.
9. Lowry JC, Bartley GB. Complications of blepharoplasty. Surv Ophthalmol 1994;38:327-50.
10. O'Brien TF. Global surveillance of antibiotic resistance. N Engl J Med 1992;326:339-40.
11. Einarsson OJ, Pers M. Streptococcal gangrene of the eyelids. Case reports. Scand J Plast Reconstr Surg 1986;20:331-5.
12. Suner IJ, Meldrum ML, Johnson TE, Tse DT. Necrotizing fasciitis after cosmetic blepharoplasty. Am J Ophthalmol 1999;128:367-8.