Case Report

Necrotizing Periorbital Cellulitis Following Aesthetic Rhinoplasty

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Rhinoplasty is rarely complicated with infection. We present a case of necrotizing periorbital cellulitis that developed in an 18-year-old woman following aesthetic rhinoplasty. The clinical manifestations consisted of swelling of the eyelids and necrosis of the lower eyelid regions, accompanied by high fever. Streptococcus pyogenes was isolated from the wound. The patient responded well to administration of intravenous amoxycillin/clavulanate and conservative local treatment. The infection resolved uneventfully. At 2-year follow-up, the cosmetic result was excellent. (Aesthetic Surg J 2005;25:270-272.)

Aesthetic rhinoplasty surgery remains one of the most frequently performed plastic surgery procedures. Despite the complexity and challenges of the procedure, complications are uncommon and infection is a rare event, occurring in less then 0.1% to 0.5% of cases. In this article, we present a rare case of severe necrotizing periorbital cellulitis involving the lower eyelid region bilaterally following a formal rhinoplasty.

Case Report

An 18-year-old female high school student in good health was admitted to our institution with signs of infection in the periorbital region. Two days prior to admission, the patient underwent aesthetic rhinoplasty at another medical facility. The patient revealed on admission to our institution that she suffered a sore throat 3 days before her surgery. No other symptoms occurred. She did not have her temperature taken or seek any medical attention. The symptoms had resolved by the time of surgery. She did not report those details to the operating surgeon, and denied experiencing any external trauma or insect bites.

The operation consisted of dorsal hump removal and lateral osteotomies. Septoplasty was not performed, and no alloplastic material was inserted. According to the surgery report, the procedure was uneventful. The patient received cefonicid preoperatively and postoperatively. The nasal packing was removed on the first postoperative day.

On admission to our department, the patient presented with fever of 102°F (38.9°C), severe periorbital swelling, erythema, and pain (Figure A and B). Mild nonpurulent rhinorrhea was also observed. The remainder of the physical examination was normal except for profound weakness and chills. She reported chills and shivering 1 hour prior to admission.

A complete blood count revealed a white blood cell count of 59,000/mm³ and marked neutrophilia of 96%. Other laboratory findings, including biochemistry, were normal, as was the ophthalmologic examination. Throat swab and blood cultures were negative for bacteria. Urinalysis and chest x-ray were normal. A direct bacteriologic microscopy following Gram stain of material obtained from the nose revealed Gram-positive cocci.

Periorbital cellulitis was diagnosed and empiric treatment with an intravenous amoxycillin/clavulanate preparation was initiated following consultation with an infectious disease specialist. The patient underwent computerized tomography (CT) in order to exclude necrotizing fasciitis of the face, abscess formation, or involvement of other anatomic structures. The CT scan was normal except for marked soft tissue edema.
On the third postoperative day, necrosis appeared on the lower eyelid region bilaterally. The wounds were conservatively treated with 2% fusidinic acid ointment. Beta-hemolytic *Streptococcus* was isolated from the material obtained from the wounds as well as from the material obtained from the nose at admission. Antibiotic treatment was continued according to antibiograms.

The patient showed gradual general improvement, consisting of normalization of the body temperature and gradual resolution of the local periorbital signs of infection. Her white blood count returned to normal. Complete secondary healing of the necrotic wounds at the lower eyelids was achieved within 1 month. Residual erythema, telangiectasis, and hyperpigmentation persisted in the healed eyelid regions for 1 year. The two-year follow-up revealed almost complete resolution of the above noted signs, except for very mild changes in pigmentation. The overall esthetic result was excellent (Figure C).

**Discussion**

The infection rate following rhinoplasty is much lower than one would expect for an operation conducted in an unsterile field. The good blood supply to the face and nose is thought to be the reason for this. Staphylococci, and less commonly streptococci, are the principal pathogens implicated. Several case reports of postrhinoplasty infection with unusual pathogens such as *Pseudomonas*, actinomycosis, and nontubercular mycobacteria were also reported.

Group A streptococci are among the few bacterial pathogens that typically produce signs of wound infection and surrounding cellulitis within 24 hours after surgery. The infection may involve the skin, subcutaneous tissue, muscle, and fascia. It can result from inoculation of organisms into the skin and subcutaneous tissue. The port of entry may be a traumatic or surgical wound, an insect bite, or any other break in skin integrity.

Periorbital cellulitis is an inflammation of the eyelids and periorbital tissues. It is differentiated from true orbital cellulitis by the absence of signs of orbital involvement, such as ptosis or limitation of eye movement. Orbital cellulitis is a potentially lethal event involving the orbital contents. Thus, it is essential to differentiate between the conditions. A CT scan or magnetic resonance imaging scan is the test of choice for this purpose.

Other infectious complications of rhinoplasty reported in the literature, such as meningitis, cerebritis, subdural empyema, brain abscesses, and cavernous sinus thrombosis, are extremely rare. One case of staphylococcal endocarditis was also reported.

Toxic shock syndrome (TSS) is a rare life-threatening infectious event following rhinoplasty. The true incidence of this syndrome following rhinoplasty is unknown; in one study it was reported to be 16.5 per million, which is proportionately higher than for the general population. No definite predisposing factors have been identified, and there is only a weak correlation between TSS and the performance of septrhinoplasty. The analogy of nasal packing to vaginal packing as a risk factor may be appropriate, but TSS has been reported in patients with nasal splints but without nasal packing. In short, to this day we do not know why some patients contract TSS after rhinoplasty while most do not.

The role of perioperative antibiotics in rhinoplasty is controversial. Most authors agree that infection rate is essentially the same whether or not prophylactic antibiotics are used. However, others believe that the use of prophylactic antibiotics is indicated in certain situations, including nasal packing for more than 24 hours, the presence of severe hematoma, and the placement of alloplastic implants and grafts.
It is difficult to indicate precisely the risk factors that may predispose a patient to the development of infection following rhinoplasty. Sinusitis is a major risk factor in the development of periorbital cellulitis in nonsurgical patients, and it seems to increase the risk of infective complication after rhinoplasty.\(^1\) Devascularized spicules of bone or severe hematoma may also increase the risk of infectious complications.\(^2\) Infection seems to have more to do with the technical details of surgery, such as performance of external lateral osteotomies, rather than with the presence of saprophytic bacteria.\(^3\) Such as performance of external lateral osteotomies, have more to do with the technical details of surgery, the risk of infectious complications.\(^2\) Infection seems to have more to do with the technical details of surgery, such as performance of external lateral osteotomies, rather than with the presence of saprophytic bacteria.\(^3\) Machida et al.\(^4\) reported a case of refractory facial cellulitis following rhinoplasty after cord blood stem cell transplantation. During the procedure, a nasal implant was inserted. It is also important to remember that the immunocompromised state of the patient may also contribute to the development of such an infection.

**Conclusion**

The patient in our case presentation experienced a rare complication following a cosmetic operation. The dramatic presentation on admission resolved with almost no scarring. The early recognition of the severity of the condition as well as the rapid initiation of appropriate antibiotic therapy prevented more severe sequelae.

In our patient, preoperative awareness of the upper respiratory infection might have served as a red flag for the possible development of postoperative periorbital cellulitis. Although nasal packing was removed on the first postoperative day, it may have also played a role in the development of infection. In view of some of the factors that might predispose to infection following rhinoplasty, we would recommend the following: Consider postponing surgery in patients with active infections elsewhere. Look for evidence of active skin or sinus infection. In addition, consider preoperative bacteriologic examination and culture of the sinuses in patients with chronic sinusitis. This would allow for appropriate antibiotic selection.\(^7\) Bone dust, spicules, and pad gauze should be carefully removed prior to closure. Nasal packing should be removed within 24 hours. It may be reasonable to administer antibiotics in the clinical situations noted above.

Even though postrhinoplasty infections are uncommon, we believe most infections are preventable with the appropriate measures. However, when infection occurs, early identification and treatment as well as aggressive (but not necessarily operative) treatment is called for. As our experience in this case demonstrates, this approach (with appropriate infectious disease consultation and support) can be enormously effective in minimizing adverse sequelae and deformity.

**References**