An Orbital Abscess Secondary to Acute Dacryocystitis

Ioannis Ntountas, MD
Ricardo Morschbacher, MD
David Pratt, MD
Bhupendra C. K. Patel, MD
Richard L. Anderson, MD
John D. McCann, MD, PhD

Abstract. An orbital abscess is an ophthalmic surgical emergency that is typically caused by the spread of bacteria from adjacent structures, such as the sinuses, eyelids, or teeth. Although acute dacryocystitis is commonly associated with preseptal cellulitis, it rarely causes orbital infection. Infection of the lacrimal sac will typically localize in the preseptal space because the lacrimal sac lies anterior to the orbital septum. To the authors' knowledge, this is the first report of an intracanal abscess secondary to acute dacryocystitis. The key points in the surgical management of this entity are discussed. [Ophthalmic Surg Lasers 1997;28: 758–761.]

Orbital abscess is an ophthalmic emergency that can lead to visual loss or life-threatening cavernous sinus thrombosis. The most common routes through which bacteria gain access to the orbit are extensions from immediately contiguous structures. The orbit is typically seeded from the sinuses, eyelids, or teeth. The lacrimal sac is located anterior to the orbital septum, and infections of the lacrimal sac are typically contained within the preseptal space. Acute dacryocystitis rarely causes orbital cellulitis and almost never results in an orbital abscess.

We present a case of a fulminate orbital abscess secondary to acute dacryocystitis. We believe this is the first reported case of an intracanal abscess secondary to acute dacryocystitis.

CASE REPORT

A 38-year-old, otherwise healthy man presented to his general ophthalmologist with erythema, swelling, and a pustule on the skin overlying the left nasolacrimal sac. The patient reported no history of epiphora. A clinical diagnosis of acute dacryocystitis was made. The patient was given an intramuscular injection of ceftriaxone sodium and was treated with an oral combination of amoxicillin and clavulanate potassium. During the next 12 hours, marked proptosis developed, and the visual acuity decreased to 20/400 in the left eye. He was admitted to a local hospital and treated with intravenous gentamicin and a combination of ticarcillin disodium and clavulanate potassium. After 72 hours of unsuccessful treatment, the patient was transferred to our care.

On presentation, the patient's visual acuity was 20/20 in the right eye and 20/400 in the left eye. The results of an examination of the right eye were entirely normal. In the left eye, the intraocular pressure was 37 mm Hg, and the orbit was firm to retropulsion. A dense, afferent pupillary defect was present, and there was erythema of the upper and lower eyelids, demarcating at the arcus marginalis. The left globe was 10 mm proptotic with no extraocular movement. The conjunctiva was chemotic with marked vascular injection. When mild pressure was applied to the globe, purulent material was expressed from a fistula adjacent to the caruncle. A cutaneous fistula was also present overlying the lacrimal sac. Corneal sensation was normal. Funduscopic examination demonstrated radial choroidal folds emanat-
ing from the optic nerve head. The posterior aspect of the fundus appeared conical, with the apex of the cone at the optic nerve head. The retinal vasculature was markedly attenuated, and no vascular pulsations were present. The fundus had a pale ischemic appearance but no cherry red spot was detected.

A magnetic resonance imaging scan demonstrated a 1.5-cm, intracanal orbital abscess (Fig. 1). The optic nerve was on stretch, resulting in a deformation of the posterior aspect of the globe. The sclera formed a 95° angle at the point of insertion of the optic nerve (Fig. 2). An abscess was also present in the nasolacrimal sac, and a fistula could be seen connecting the nasolacrimal sac with the intracanal abscess (Fig. 3). No evidence of cavernous sinus thrombosis was present.

The patient was taken immediately to the operating room where an anterior orbitotomy and external drainage of the lacrimal sac (dacryocystotomy) were performed. The cutaneous fistula overlying the lacrimal sac was opened and a large amount of purulent material and a dacryolith was irrigated out of the lacrimal sac. A Jackson–Pratt drain was positioned into the lacrimal sac, externalized, and sutured in place. A second incision was made just posterior and inferior to the caruncle. Dissection was carried out to the equator in a plane between the
sclera and Tenon’s capsule. At the equator, the Tenon’s capsule was opened, and purulent material emanated from the retrobulbar abscess. A second Jackson–Pratt drain was sutured in place to maintain drainage from the retrobulbar space. Samples of purulent material were sent to the laboratory for Gram’s stain and culture.

Review of the Gram’s stain demonstrated 3+ gram-negative rods, 2+ gram-positive cocci, and 3+ polymorphonuclear leukocytes. Postoperatively, the patient received intravenous vancomycin, clindamycin hydrochloride, and ceftazidime. During the next 4 days, the vision demonstrated slow clinical improvement, returning to 20/100, and the proptosis, erythema, and swelling diminished. On the fourth postoperative day, the patient inadvertently removed his Jackson–Pratt drains, which were continuing to drain purulent material. An orbital computed tomography scan and ultrasound were obtained and were consistent with a persistent retrobulbar abscess and a lacrimal sac abscess. Based on these imaging studies, a second orbitotomy and a dacryocystorhinostomy were performed. No purulent material was found in the lacrimal drainage system or in the orbit during this second procedure.

Cultures demonstrated a mixed infection with 3+ Streptococcus anginosus, 4+ Peptostreptococcus, and 4+ anaerobic gram-negative rods. The patient continued to show clinical improvement after the second procedure and was discharged on his tenth day of hospitalization. At home, he received an additional 14 days of intravenous cefazolin and oral metronidazole. Six weeks after initial presentation, the vision in his left eye returned to 20/20. He had 2 mm of proptosis on the left side and was without diplopia in all fields of gaze.

DISCUSSION
The lacrimal sac is a preseptal structure, and acute dacryocystitis is commonly associated with preseptal cellulitis. It is rare for bacterial infections of the lacrimal sac to penetrate the orbital septum and lead to orbital cellulitis or orbital abscess. In fact, only two cases of orbital cellulitis secondary to acute dacryocystitis have been reported. In a large review of 148 patients with orbital abscess, none had acute dacryocystitis as the source of infection. It has been reported, however, that an infant with congenital nasolacrimal duct obstruction had acute dacryocystitis and a retrobulbar orbital abscess within the first month of life. Also, a case has been described in which a 40-year-old man had an extraconal orbital abscess adjacent to an infected lacrimal sac. To our knowledge, this study is the only case of an adult having an intraconal orbital abscess secondary to acute dacryocystitis. We speculate that in this case of acute dacryocystitis an orbital abscess developed because the virulent infectious organisms formed a fistula between the lacrimal sac and the intraconal spine.

This case exemplifies three important points of surgical management. First, a narrowing of the posterior globe angle to less than 120°, or marked elevation of orbital pressure constitutes a surgical emergency. This patient presented with elevated orbital pressure and proptosis great enough to place tension on the optic nerve, as well as a decrease of the posterior globe angle to 95°. The prompt decompression of the orbital abscess probably contributed to this patient’s favorable outcome.

Second, acute drainage of a lacrimal sac abscess is indicated particularly when it is the source of orbital infection. It is controversial whether a dacryocystostomy (external drainage) or a dacryocystorhinostomy (intranasal drainage) is the preferred procedure in hyperacute dacryocystitis. In our experience, dacryocystorhinostomy is associated with a high risk of late failure due to extensive scarring. Initially, we prefer to drain the lacrimal sac externally and treat with antibiotics. When the inflammation has resolved, a dacryocystorhinostomy is performed.

Third, the decision to return to the operating room for a second drainage of an orbital abscess should be based primarily on the clinical course. It is common for imaging studies obtained after drainage of an abscess to suggest a residual abscess; however, we have noted only serosanguineous fluid in most of the reoperation cases. The decision to return to the operating room should be based on all available data, with greatest emphasis placed on the patient’s clinical course.

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REFERENCES
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