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Acute dacryocystitis complicated by orbital cellulitis and loss of vision: A case report and review of the literature

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ABSTRACT

INTRODUCTION: Acute dacryocystitis usually presents as a pre-septal cellulitis since the lacrimal sac lies anterior to the orbital septum. Orbital cellulitis secondary to acute dacryocystitis is very rare due to a variety of anatomic barriers to the orbit but can occur and result in abscess formation with risk of visual compromise.
PRESENTATION OF CASE: We describe a case of otherwise healthy adult who presented with complete visual loss following orbital cellulitis and abscess formation secondary to acute dacryocystitis. The clinical, radiological, intraoperative and postoperative findings are discussed.
DISCUSSION: Typically, orbital cellulitis responds well to systemic antibiotic and surgical drainage without permanent visual loss. There are 7 cases reported in the literature of acute dacryocystitis complicated by permanent visual loss.
CONCLUSION: Patients with acute dacryocystitis need to be carefully monitored for signs of orbital cellulitis. Prompt recognition and appropriate treatment of this condition are essential.

1. Introduction

Acute dacryocystitis commonly causes pre-septal cellulitis as the lacrimal sac lies anterior to the orbital septum. Due to natural anatomic barriers to the orbit, orbital cellulitis secondary to acute dacryocystitis is very rare but has been reported resulting in abscess formation with risk of visual loss. Typically, orbital cellulitis responds well to systemic antibiotic therapy and surgical drainage without permanent loss of vision [1]. We describe a case of otherwise healthy adult who presented to our academic institution with complete visual loss following orbital cellulitis and abscess formation secondary to acute dacryocystitis. Our case has been prepared and reported in line with the SCARE criteria in: "The SCARE Statement: Consensus-based surgical case report guidelines". International Journal of Surgery 2016; 34:180–186. The authors further stress that they have no financial disclosures related to their recommendations [1].

2. The case

A 35-year old male presented with pain, redness and eyelid swelling of the right eye for 3 days. His condition was rapidly progressing with proptosis, restricted eye movement and decreased vision in the right eye over the following day. He had no associated history of fever. He was otherwise healthy and had no history of trauma. Prior to his presentation, the right eye was completely normal with normal vision and eye movement. He had visited another hospital 2-days prior to his presentation to us but did not have any symptoms suggestive of cellulitis at that time. He was diagnosed with acute dacryocystitis and pre-septal cellulitis on the right side, was given oral antibiotics and discharged home with a follow up appointment in 3 weeks. Despite compliance with the oral antibiotics, his symptoms continued to worsen until he lost the vision in his right eye, which brought him to our emergency room seeking urgent medical advice.

On evaluation, his vital signs were stable. The clinical examination showed right upper and lower eyelid erythema and edema, which was tense on attempted retropulsion, and right eye proptosis with complete ophthalmoplegia (Fig. 1A & B). The visual acuity of the right eye was no light perception and of the left eye was 20/20. The intraocular pressure of the right eye was 50 mmHg while it was 16 mmHg in the left eye. The right pupil was fixed, mid-dilated, and nonreactive to light. The slit lamp examination of the right eye showed conjunctival chemosis and signs of exposure keratopathy.

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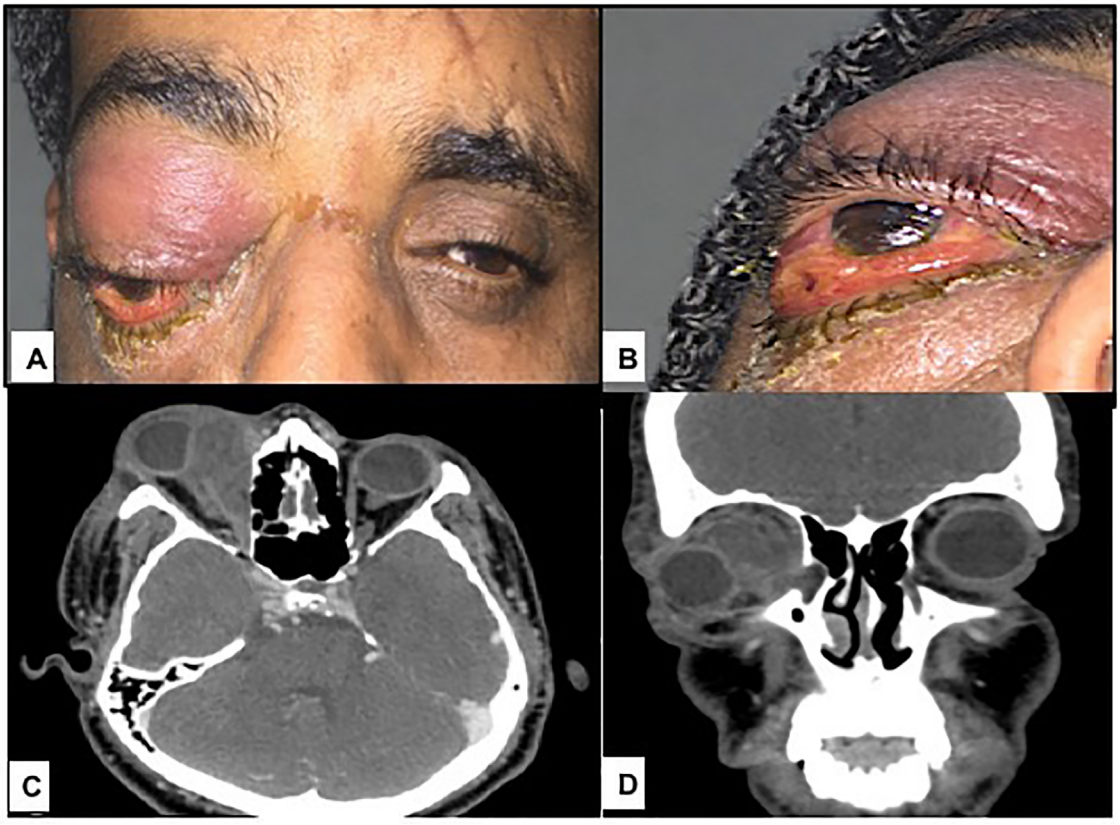

Fig. 1. A & B: External photograph showing right eye dystopia and proptosis, right upper and lower eyelid edema and erythema and conjunctival chemosis. C & D: Axial and coronal CT of the orbit with contrast showing dilatation of the right lacrimal sac, a large extraconal non-enhancing fluid collection seen adjacent to the right medial rectus muscle and causing mass effect on the globe.

Fundus examination of the right eye showed hyperemic disc and choroidal folds. The slit lamp examination and fundus examination of the left eye were unremarkable.

A computed tomography (CT) of the right orbit with contrast showed dilatation of the right lacrimal sac as well as the ipsilateral nasolacrimal duct. The lacrimal sac was showing rim enhancement extending into the extra-orbital post septal region. There was a large extraconal non-enhancing collection measuring 4.7 cm (anteroposterior) × 2.0 cm (transverse) × 2.1 cm (cranio-caudal) seen adjacent to the right medial rectus muscle and causing mass effect on the globe (Fig. 1C & D). The findings were in favor of right-sided dacryocystitis associated with orbital cellulitis and extraconal orbital abscess.

He was immediately started on intravenous ceftriaxone and clindamycin and underwent urgent surgical drainage of the abscess. Intraoperatively the abscess was drained from the lacrimal sac and medial part of the orbit (Fig. 2A) and a swab was taken from the purulent material for microbiology. Posterior rupture of the lacrimal sac into the orbit was expected. Irrigation was done using normal saline and cefazolin. Irrigation of the lacrimal drainage system showed the reflux coming through the drain which confirmed the nasolacrimal duct obstruction (Fig. 2B).

Postoperatively, proptosis had markedly reduced as well as the eyelid edema and erythema. Improvement in motility was also noted and conjunctival chemosis became much less. His visual acuity remained at no light perception. Culture results were positive for staphylococcus epidermidis which was sensitive to ceftriaxone and clindamycin. Intravenous dexamethasone was administered on the third postoperative day with marked improvement in the extraocular motility and periocular swelling. He was discharged on the seventh postoperative day on oral amoxicillin/clavulanic acid and was followed up as an outpatient. Three months later, he underwent right external dacryocystorhinostomy and intubation without complications. He was followed up regularly with a plan for stent removal 4 months after the surgery. He did not regain vision and developed right optic nerve atrophy (Fig. 2C & D).

3. Discussion

Dacryocystitis is an infection of the lacrimal sac due to nasolacrimal duct obstruction. Acute dacryocystitis can present as a pre-septal cellulitis, which generally involves soft tissue in the pre-septal area. Orbital cellulitis is a vision-threatening infectious process involving the ocular adnexal structures posterior to the orbital septum. Orbital cellulitis can rarely occur secondary to acute dacryocystitis and typically responds well to systemic antibiotic and surgical drainage without permanent visual loss [2]. The attachment of orbital septum to the lacrimal crest prevents the spread of infection to the posterior orbit. In addition, other anatomical structures such as the lacrimal fascia, the posterior limb of the medial canthal ligament, and deep heads of the pre-tarsal and pre-septal orbicularis muscles also act as a barrier to posterior extension. Orbital abscess secondary to dacryocystitis generally occurs in the medial and inferior aspects of the globe because of the anteroinferior location of the lacrimal sac. The anterior and inferior location of the lacrimal sac in relation to the globe can result in a channel of communication between the medial and inferior rectus muscles directly to the intraconal space, which can result in rapid loss of vision necessitating urgent surgical intervention [3].

There are 7 cases of visual loss following orbital cellulitis secondary to acute dacryocystitis reported in the literature. Summary of the cases (including ours) is shown in Table 1. Kikkawa et al.