



Figure 1

A 3-year-old boy presented for evaluation of left periorbital swelling.

Case

A 3-year-old boy was brought to the ED by his parents for evaluation of left periorbital swelling. A few days prior to presentation, the child was seen at an outpatient center where he was diagnosed with preseptal cellulitis and given an oral antibiotic. However, even after receiving three doses of the antibiotic, the periorbital swelling and redness around the child's eye worsened, prompting this visit to the ED.

Physical examination revealed edema and erythema both above and below the left eye, with associated tenderness to palpation. A contrast-enhanced maxillofacial computed tomography (CT) scan, with special attention to the orbits, was ordered; representative images are shown (Figure 1a-1c).

What is the diagnosis?

Dr Rotman is a fellow, department of radiology, Weill Cornell Medical College, New York, New York. **Dr Hentel** is an associate professor of clinical radiology, Weill Cornell Medical College, New York, New York; executive vice chairman, department of radiology, New York-Presbyterian Hospital/Weill Cornell Medical Center; and associate editor, imaging, of EMERGENCY MEDICINE. **Dr Kazam** is an assistant professor of radiology, Weill Cornell Medical College, Cornell University, New York; and an assistant attending radiologist, New York-Presbyterian Hospital, New York. He is the chief of emergency/musculoskeletal imaging, department of radiology, New York-Presbyterian Hospital/Weill Cornell Medical Center.

Authors' Disclosure Statement: The authors report no actual or potential conflict of interest in relation to this article.

DOI: 10.12788/emed.2017.0060

■ Answer



Figure 2

The CT images of the orbits demonstrated edema in the superficial left eyelid (**white arrows, Figure 2a and 2b**) and left deep orbital septum (**red arrows, Figure 2a-2c**). A peripherally enhancing fluid collection centered in the left nasolacrimal gland was present (**red asterisks, Figure 2b and 2c**) with mild mass effect on the left globe. Opacification was also noted within the paranasal sinuses (**white asterisks, Figure 2a-2c**). Together these findings indicated sinusitis with dacryocystitis and orbital cellulitis.

Dacryocystitis

Dacryocystitis is an infection or inflammation of the lacrimal sac, usually developing secondary to blockage of the nasolacrimal duct. Orbital cellulitis is an infection involving the contents of the orbit, including the fat and ocular muscles. Orbital cellulitis should not be confused with preseptal cellulitis, which is an infection involving the eyelid occurring posterior to the orbital septum. While both of these conditions are more common in children than in adults, preseptal cellulitis is much more common than orbital cellulitis.

Preseptal Cellulitis

Preseptal cellulitis is typically due to local trauma, local skin infection, or dacryocystitis.¹ Preseptal cellulitis

rarely extends into the orbit, though a minority of cases have been reported in patients with concomitant dacryocystitis.² Orbital cellulitis most commonly results from paranasal sinus disease, particularly of the ethmoid sinus, which is only separated from the orbit by the thin lamina papyracea.³ While both preseptal cellulitis and orbital cellulitis can cause eyelid swelling and erythema, preseptal cellulitis is typically a mild condition. Orbital cellulitis, however, is a serious medical emergency that requires prompt diagnosis and treatment to avoid loss of vision and intracranial complications, such as venous thrombosis and empyema.³

Imaging Studies

Although the clinical features of orbital cellulitis (eg, proptosis, ophthalmoplegia, pain with ocular movement) can sometimes distinguish it from preseptal cellulitis, imaging studies are helpful to confirm the diagnosis.⁴ As previously noted, prompt recognition, diagnosis, and treatment of orbital cellulitis are essential to avoid serious complications.

Computed tomography has a high specificity and sensitivity in detecting the extension of infection into the orbit and associated complications such as subperiosteal or intracranial abscess. For patients in whom intravenous (IV) contrast is contraindicated or who wish to

avoid ionizing radiation, magnetic resonance imaging is a useful alternate modality, and diffusion-weighted imaging is particularly sensitive in diagnosing abscess.⁵

Treatment

Since polymicrobial infection is common in periorbital cellulitis, broad-spectrum IV antibiotics (eg, ampicillin-sulbactam, cefuroxime, ceftriaxone, piperacillin/tazobactam) are usually indicated initially.⁶ The patient in this case was given IV ceftriaxone and clindamycin and oral amoxicillin/clavulanic acid for 3 days, after which he was discharged home in the care of his parents with instructions to complete a 14-day total course of oral amoxicillin/clavulanic acid as well as a 21-day course of fluticasone for nasal irrigation.

References

1. Baring DE, Hilmi OJ. An evidence based review of periorbital cellulitis. *Clin Otolaryngol*. 2011;36(1):57-64. doi:10.1111/j.1749-4486.2011.02258.x.
2. Kikkawa DO, Heinz GW, Martin RT, Nunery WN, Eiseman AS. Orbital cellulitis and abscess secondary to dacryocystitis. *Arch Ophthalmol*. 2002;120(8):1096-1099.
3. Mathew AV, Craig E, Al-Mahmoud R, et al. Paediatric post-septal and pre-septal cellulitis: 10 years' experience at a tertiary-level children's hospital. *Br J Radiol*. 2014;87(1033):20130503. doi:10.1259/bjr.20130503.
4. Rudloe TF, Harper MB, Prabhu SP, Rahbar R, Vanderveen D, Kimia AA. Acute periorbital infections: who needs emergent imaging? *Pediatrics*. 2010;125(4):e719-e726. doi:10.1542/peds.2009-1709.
5. Sepahdari AR, Aakalu VK, Kapur R, et al. MRI of orbital cellulitis and orbital abscess: the role of diffusion-weighted imaging. *AJR Am J Roentgenol*. 2009;193(3):W244-W250. doi:10.2214/AJR.08.1838.
6. Ho CF, Huang YC, Wang CJ, Chiu CH, Lin TY. Clinical analysis of computed tomography-staged orbital cellulitis in children. *J Microbiol Immunol Infect*. 2007;40(6):518-524.