A rare case of *Enterococcus faecalis*-induced orbital cellulitis and myositis

Piyush Kohli, Parul Ichhpujani, Rakesh Kumar Bansal, Suresh Kumar

Orbital cellulitis is an infection of soft tissue behind the orbital septum. Common pathogens isolated include *Staphylococcus aureus*, *Staphylococcus epidermidis*, and *Streptococcus pneumoniae.* It is a straightforward diagnosis and usually responds to empirical treatment without any sequela. We report a case of orbital cellulitis caused by *Enterococcus faecalis*, which was complicated by myositis of levator palpebrae superioris. To the best of our knowledge, only one case report exists dating way back to 1986.

Key words: Cellulitis, *Enterococcus faecalis*, myositis, levator palpebrae superioris

Orbital cellulitis is an infection of soft tissue behind the orbital septum. Predisposing factors include sinusitis, upper respiratory tract infections, odontogenic abscess, facial infections, and dacryocystitis.[1] Common pathogens isolated include *Staphylococcus aureus*, *Staphylococcus epidermidis*, and *Streptococcus pneumoniae*.[2] We report a case of orbital cellulitis with associated myositis caused by *Streptococcus faecalis*. To the best of our knowledge, only one case report exists dating way back to 1986.[3]

Case Report

A 10-year-old Asian Indian male child was brought to the emergency services of our tertiary care hospital with progressive bulging of the left eye for the past 7 days. It was associated with deep constant periorbital pain, inability to close the eye, fever with no rigors or chills, discharge, and decreased vision. The patient gave a history of scratching of boil over the left upper eyelid 3 days before start of symptoms. There was no history of upper respiratory tract infection, toothache, ear discharge, insect bite, or trauma. The patient had received oral penicillins before presentation at our center, but there was no relief.

Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/0301-4738.191513

Department of Ophthalmology, Government Medical College and Hospital, Chandigarh, India

Correspondence to: Dr. Parul Ichhpujani, Department of Ophthalmology, Level III, Block D, Government Medical College and Hospital, Sector 32, Chandigarh, India. E-mail: parul77@rediffmail.com

Manuscript received: 28.12.15; Revision accepted: 28.06.16

Examination of the affected eye revealed visual acuity of 6/24, hypoglobus, mechanical ptosis, restriction of ocular movements in all directions; swelling of lids with overlying redness of skin with raised temperature and tenderness on palpation. Anterior segment examination showed conjunctival chemosis and diffuse descemet folds while posterior segment examination was unremarkable. Investigation showed hemoglobin of 13.6 g/dL, total leukocyte count of 12,500/mm^3, erythrocyte sedimentation rate of 45 mm in 1st h, and no pus cells in urine. Blood and urine cultures were negative. Noncontrast computerized tomography (NCCT) scan showed ill-defined hypodense collection in the extraconal department of the left orbit, extending up to orbital septum and causing proptosis suggestive of orbital abscess. There was associated with thickening of superior rectus-levator palpebrae superioris (SR-LPS) complex but no evidence of sinusitis [Fig. 1].

A straightforward diagnosis of orbital cellulitis with abscess formation was made; and intravenous amoxicillin (25 mg/kg/day in three divided doses) and clavulanic acid and metronidazole (7.5 mg/kg/day in three divided doses) and amikacin (15 mg/kg/day in three divided doses) were started empirically. Abscess was drained and pus samples were sent for microbiological examination. We were left in a fix when there was no improvement even after 3 days of treatment. Microbiology report unveiled the mystery behind this odd behavior and guided us toward the correct path for further management. Culture on blood agar showed greenish discoloration suggestive of alpha (complete) hemolysis while MacConkey agar showed magenta-colored colonies. Microscopy shows Gram-positive spectacle-shaped cocci arranged at an angle to each other and in lines. The organism was catalase negative, grew on 6.5% sodium chloride, and produced black colonies on blood tellurite agar. This confirmed the presence of *Enterococcus faecalis* [Fig. 2]. Sensitivity as per the Clinical and Laboratory Standards Institute revealed resistance to ciprofloxacin, penicillins, and cotrimoxazole and sensitivity to clindamycin, teicoplanin, linezolid, gentamicin, and doxycycline. After pediatric consultation, intravenous clindamycin (20 mg/kg/day in three divided doses) and gentamicin (1.5 mg/kg/day in three divided doses) were started. Swelling and proptosis started reducing by day 2 of revised therapy. On day 10, best-corrected visual acuity improved to 6/6, swelling and proptosis disappeared, and extraocular movements became full and free. Some amount of ptosis persisted while extraocular movements were full and free. Repeat NCCT showed thickened LPS-SR complex, with involvement of tendons suggestive of myositis [Fig. 3a and b]. The patient was then put on oral steroids 1 mg/kg/day. After 1 month of

Cite this article as: Kohli P, Ichhpujani P, Bansal RK, Kumar S. A rare case of *Enterococcus faecalis*-induced orbital cellulitis and myositis. Indian J Ophthalmol 2016;64:609-11.

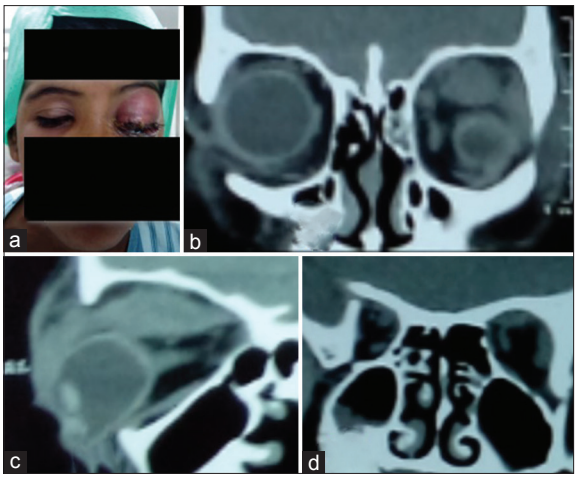

Figure 1: At presentation. (a) Clinical picture, (b) ill-defined hypodense collection in the extraconal department of the orbit suggestive of orbital abscess, (c) thickening of superior rectus-levator palpebrae superioris complex, (d) clear sinuses on left

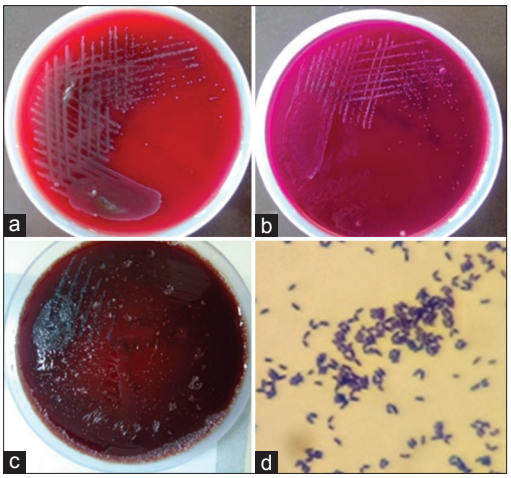

Figure 2: Microbiological evidence. (a) Greenish colonies on blood agar, (b) magenta colonies on MacConkey agar, (c) black colonies on blood tellurite agar, (d) microscopy showing spectacle-shaped Gram-positive cocci arranged at an angle to each other

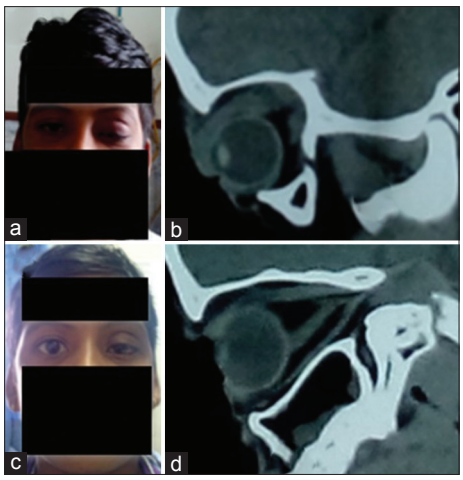

Figure 3: Two weeks after treatment. (a) Left persistent ptosis, (b) superior rectus-levator palpebrae superioris complex thickened with involvement of tendons. One month after treatment, (c) improving ptosis, (d) decreased thickness of superior rectus-levator palpebrae superioris complex

steroid treatment, there was improvement in the amount of ptosis [Fig. 3c and d].

Discussion

After a thorough search of scientific literature, we could find only one case of orbital cellulitis caused by *S. faecalis*, reported by Biedner *et al*. in 1986.[3] They reported a 2.5-month-old female who was hospitalized with septicemia, ethmoiditis, and orbital cellulitis and was managed with intravenous ampicillin. Unlike the earlier reported case, our patient was healthy with no history of admission to a hospital. Infection probably spread from his contaminated hands when he scratched his boil. Gamble suggested three routes for spread of infection: (1) Extension from an adjacent tissue, (2) septicemia, or (3) a wound.[4] In pediatric population, 90% of patients with orbital cellulitis have existing sinusitis[5] while our patient had clear sinuses on CT scan.

Enterococcus is an emerging agent of upper and lower airway diseases, including paranasal sinuses.[6] Therefore, possibility of cases associated with *E. faecalis* which remained undiagnosed cannot be ruled out. The undiagnosed cases may have simply responded to the therapy given, and no abscess formation may have taken place.

Enterococcus group was originally classified with streptococci as Group D. Lancefield classified hemolytic streptococci on the basis of nature of carbohydrate antigen on cell wall into twenty Lancefield groups. On blood agar, they are usually nonhemolytic but may show alpha (complete) or beta (incomplete) hemolysis. On MacConkey agar, being lactose fermenters, they give tiny deep pink colonies. On microscopy, they appear as oval cocci, arranged at an angle to each other or in lines. They can be distinguished from other streptococci as they grow in the presence of 40% bile, 6.5% NaCl, 9.6 pH, at 45°C, in 0.1% methylene blue and survive at 60°C for 45 min. Most prominent members include *E. faecalis and Enterococcus faecium*. *E. faecalis* can be identified by its ability to produce black colonies on tellurite agar and ferment mannitol, sucrose, sorbitol, and esculin.[6]

Chaudhry *et al*. in their review of 218 patients of orbital cellulitis reported 4 patients with persistent ptosis after resolution of orbital cellulitis and found delayed intervention to be the common factor.[1] In our case, precise treatment was delayed for about 10 days pending the microbiological confirmation of the causative agent. Orbital myositis secondary to orbital cellulitis has rarely been reported in literature.[7] Thickening of LPS-SR complex in our case suggests myositis of LPS, which was responsible for persistence of ptosis. This case highlights one of the very rare complications of orbital cellulitis.

Conclusion

The material obtained from abscess drainage should be handled properly and sent for microbiological examination to identify the causative organism and sensitivity. This is especially important, like in our case, where the causative

agent was an unusual one and would not have responded to the empirical therapy. An accurate diagnosis and early intervention are required to prevent the deadly complications of orbital cellulitis. We must understand that antibiotics need to be used judiciously to restrict the resistance being developed by the microbes.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Chaudhry IA, Shamsi FA, Elzaridi E, Al-Rashed W, Al-Amri A, Al-Anezi F, *et al.* Outcome of treated orbital cellulitis in a tertiary eye care center in the middle East. Ophthalmology 2007;114:345-54.
2. McKinley SH, Yen MT, Miller AM, Yen KG. Microbiology of pediatric orbital cellulitis. Am J Ophthalmol 2007;144:497-501.
3. Biedner BZ, Marmur U, Yassur Y. *Streptococcus faecalis* orbital cellulitis. Ann Ophthalmol 1986;18:194-5.
4. Gamble RC. Acute inflammation of the orbit in children. Arch Ophthalmol 1933;10:483-97.
5. Ferguson MP, McNab AA. Current treatment and outcome in orbital cellulitis. Aust N Z J Ophthalmol 1999;27:375-9.
6. Savini V, Gherardi G, Astolfi D, Polilli E, Dicuonzo G, D'Amario C, *et al.* Insights into airway infections by enterococci: A review. Recent Pat Antiinfect Drug Discov 2012;7:36-44.
7. Manuchehri K, Lagnado R, Butler L. A case of orbital myositis secondary to orbital cellulitis in a child. Eye (Lond) 2003;17:434-6.