

A Case of Orbital Cellulitis with Accompanying Bilateral Ptosis

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ABSTRACT

A case study of a young male with right orbital cellulitis secondary to sinusitis is presented. Ocular signs are described, including decreased visual acuity, ptosis, proptosis, pain, and restriction of ocular movements. The patient had a number of clinical signs, including a decompensating intermittent exotropia and the continued

presence of bilateral ptosis following resolution of the orbital cellulitis. It was concluded that the patient likely had previously unknown pre-existing conditions, which meant that he will continue to require ophthalmic and orthoptic management beyond the resolution of the orbital cellulitis.

Key Words: orbital cellulitis, sinusitis, orbital abscess, ptosis

INTRODUCTION

Orbital cellulitis is an infection of the soft tissues of the orbit posterior to the orbital septum.¹⁻³ It is a serious condition with many dangers, including optic nerve involvement that can result in decreased vision, cavernous sinus thrombosis, inflammation of meninges and brain abscess.^{1,2,4-8} This condition needs to be treated as a medical emergency, with hospital admission often necessary, requiring medical and surgical intervention. It often develops suddenly and is generally accompanied by unilateral chemosis, ocular movement restrictions, severe pain, proptosis and lid swelling, and may also have decreased visual acuity and an afferent pupillary defect.^{1,3,5,7,8}

defect. Ocular movements were affected, with underactions of -3 in all gazes except elevation, laeoelevation and laevodepression, which were -4. He was diagnosed with right orbital cellulitis secondary to sinusitis, and admitted to hospital where he remained for 14 days. Swab results found two streptococci species as the cause of the infection. Management included initial superior orbital abscess drainage, followed by drainage of ethmoid, maxillary and frontal sinuses; with intravenous benzylpenicillin for two weeks, vancomycin for five days, and metronidazole (Flagyl) for two weeks. Post surgery he complained of an increase in eye pain and further decreased VA, and proptosis was noted.

CASE REPORT

In early September 2009, 14-year old Master C attended the clinic for review of his resolving orbital cellulitis. He had previously attended in August, following his original treatment in hospital.

At initial presentation in hospital during July, Master C complained of severe pain and swelling, resulting in trouble opening his eye. Right visual acuity (VA) was count fingers 2 m (right side of visual field) and count fingers ½ m (left side of visual field); left VA was 6/6. He had no afferent pupil

At discharge, VA had improved to 6/9 part and ocular movements were only mildly restricted in upward gaze. The right upper lid had mild swelling and ptosis, however a left ptosis was also noted. The right palpebral fissure width was 5 mm and the left 7 mm, and right levator function was 5 mm and left 13 mm. A significant exophoria was present that decompensated to an intermittent exotropia with consequent diplopia, however it was concomitant in both right and left gaze, with no medial rectus underaction. Due to the diplopia being intermittent, no treatment was given at this stage to allow for the resolving orbital cellulitis. Master C was reviewed monthly and since discharge he was treated with chloramphenicol (Chloromycetin) ointment and dexamethasone (Maxidex) drops twice daily (bd) in the right eye and ciprofloxacin (Ciloxan) drops bd to the right nostril.

Two months following discharge, uncorrected RVA was 6/18 and LVA 6/6-1. Subjective refraction RE was -0.75/-

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0.50 x 105° = 6/6, and LE -0.50/-0.50 x 105° = 6/5-1. He demonstrated a 20 to 25 dioptre exophoria with moderate recovery at both near and distance. Convergence function was of no concern, his near point being closer than 10 cm. Distance prism cover test in nine directions was performed with changes in head position whilst he fixed on a light source (Table 1). This was performed to clarify any residual vertical limitation.

Table 1. Distance prism cover test in nine directions (left eye fixing)

	30BI 6L/R	35BI 3L/R	25BI	
Right Gaze	18BI	22BI	10BI	Left Gaze
	10BI	12BI	8BI	

Ocular movements had continued to improve with only a minor underaction in dextrolevation and all medications were finished. The orbital cellulitis had resolved, diplopia was no longer present and bilateral ptosis was now Master C's greatest concern. At the next review, consideration was to be given to the prescription of glasses and discussion of ptosis surgery.

DISCUSSION

Cellulitis has been reported as occurring in 3% of cases of sinusitis.³ The incidence of sinusitis as a cause of cellulitis has been reported as between 66% and 91%.^{1,3,5,7} Multiple sinus involvement, as in this case, has been reported in 20% to 35% of cases.^{1,5,8} Orbital cellulitis occurs following sinus infection, most commonly the ethmoid and maxillary sinuses, either by direct spread to the orbit through the thin porous walls, or through normal venous drainage channels.^{3,7-9} Surgical treatment involves drainage of any orbital or subperiosteal abscess, which allows the condition to resolve.^{6,8,9} Drainage of the abscess aims to prevent potential visual function loss⁷ and any damage to extraocular muscles.⁶ Orbital cellulitis is commonly a result of the bacteria staphylococcus aureus or streptococcus pyogenes,^{1,2,5,7-9} which was the case with Master C, where two streptococci species were found. As with Master C who is aged 14 years, it is usually children or young adults who present with orbital cellulitis,^{5,7} the condition occurring most commonly in children aged 0 to 16 years, as sinusitis becomes more prominent as they reach preteen years.^{1,2,7,8} It has been stated that there is a gender preference with twice as many males affected than females,^{1,2,8} and that seasonal changes, in particular colder weather may play a part in the development of the condition.^{1,5} The presence of an orbital abscess would have resulted in Master C's condition falling into the category of severe,⁷ with the average length of stay for these patients

being reported as 10 to 11 days due to surgical intervention being required.⁷⁻⁹ Master C's stay of 14 days was therefore longer than the average, but this was as a result of the necessary surgeries that occurred and the decrease in VA and prolonged pain that resulted. In the case of Master C, upon initial presentation his condition reflected all the classic characteristics with results consistent with those found in reported studies.

Of interest in this case is the suspicion that there were pre-existing undiagnosed conditions. He presented with problems with his right eyelid, however examination at discharge noted a bilateral ptosis. A note in the patient's history stated 'noticed droopy eyelids' previously, but he had never had an ocular examination. Lid swelling due to the accumulation of fluids, rather than ptosis, is a feature of orbital cellulitis,^{1-3,5,7-9} and it is generally considered that a bilateral ptosis indicates a congenital origin.¹⁰ Normal palpebral fissure width is 10 mm, indicating that both the left and right eyes can be considered abnormal, with a bilateral asymmetrical ptosis is present.^{11,12} As normal levator muscle function is defined as 12 to 17 mm, the left may be considered normal, however the right eye would be graded as 'fair' as it is between 5 and 8 mm.^{13,14} It may also be of note that strabismus has been reported as occurring in 20% of cases of cases of congenital ptosis, compared to 1% to 5% of the general population, with horizontal strabismus accounting for two-thirds of these.^{13,14}

The second issue is the presence of a moderately large exophoria of mixed type for near and distance, with a V-pattern. During the acute phase of the cellulitis this decompensated to an intermittent exotropia. In the Sydney Myopia Study it was reported that exophoria was present for near fixation in 52.2%, and for distance in 7.8%, of 12-year old children, though the incidence of any heterophoria of 10 dioptres or larger was only 3.2%.¹⁵ It was also reported that 12.3% of 12-year olds were 0.50 dioptres or more myopic, and that those who were myopic were 2.1 times more likely to have an exophoria for near and 3.1 times more likely for distance.¹⁵ This would support the hypothesis that increasing myopia and its effect on the accommodative convergence control mechanism may also have contributed to the decompensation.

With the one-line difference in final vision, the question was raised of the possibility of a residual defect from the cellulitis or a pre-existing amblyopia. Amblyopia has been defined as a visual acuity difference of two lines or more,¹⁶ and one line of a LogMAR chart is considered a normal interocular difference.¹⁷ So, the one-line difference in best corrected visual acuity would be considered normal.

In summary, after full recovery from an acute episode of orbital cellulitis, it is suspected that Master C had a combination of pre-existing ocular conditions that manifested or became obvious during or after his recovery. These included a bilateral asymmetric ptosis, a moderately

large exophoria of mixed type, and increasing myopia. During the acute phase the exophoria decompensated, most likely due to a combination of the decreased visual acuity and the vertical limitations. It remains to be seen whether he will maintain the good control of his exophoria, or whether myopia will become an increasingly dissociative factor.

CONCLUSION

Orbital cellulitis is potentially dangerous to the eye and may be a life-threatening condition, however with suitable treatment it can be resolved. Many patients like Master C are of a young age, and obtain the infection from sinusitis. If the patient fails to respond to antibiotics, VA is decreasing, or an abscess is present, surgery is indicated. Sinusitis is the most common cause of orbital cellulitis, and with appropriate intravenous antibiotics and surgical care, recovery is optimistic with the major complications of the condition all but eliminated.^{1,8} It is important to acknowledge that in this case the clinical dilemma was whether the ocular signs remaining after the resolution of the condition were pre-existing or a residual effect of the orbital cellulitis. Ocular conditions such as orbital cellulitis may not present as a textbook case, and awareness of this enables the clinician to manage the patient effectively.

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