Orbital emphysema after sneezing: a case report

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INTRODUCTION

Orbital emphysema is the abnormal condition in which air is present within the orbit.¹ Air in orbital emphysema most commonly comes from fractures or bony dehiscences of the ethmoid sinus and rarely results from isolated maxillary fractures or complex fractures involving the sphenoid and frontal sinuses.^{2–4} This condition is generally sudden in onset and follows a benign course and is treated by supportive measures.⁵ Rarely can this condition potentially cause an acute orbital compartment syndrome with central retinal artery occlusion and ischaemic optic neuropathy.^{6,7} Following is a case report of a patient who developed unilateral orbital emphysema due to injury to the lamina papyracea after sneezing.

CASE REPORT

A 39-year-old male patient presented with a sudden onset of progressive painless swelling and turgidity of the eyelids on the right-hand side after a bout of violent sneezing. He had difficulty in opening the eyelids. There was no impairment of vision, double-vision or headache. There was no history suggestive of sinus disease. He denied history of recent or remote facial trauma or rhinosinusal surgery.

Patient examination revealed crepitant swelling and ptosis of the right upper eyelid. Otorhinolaryngologic evaluation was normal. On ophthalmologic examination, the visual acuity was normal for both eyes. Proptosis was not present. There was no palsy of the external ocular muscles. Pupillary reactions were normal. The intraocular pressure was normal and the sclera, cornea, lens, vitreous, retina, and the optic disc were bilaterally normal. His vitals were within the normal range.

Radiographs of the paranasal sinuses (Caldwell's view and Water's view) were requisitioned, which revealed foci of peri-orbital air density on the right-hand side, suggestive of orbital emphysema (Figure 1). No fracture or other bony abnormality

was evident. Subsequently, a high resolution computed tomographic (CT) scan of the orbits and paranasal sinuses was performed; 5.0 mm axial images were obtained with 1.0 mm reconstructions in both soft tissue and bone windows. Soft tissue swelling with extraconal orbital and palpebral emphysema was seen on the right-hand side. No intraconal air was evident. There was no proptosis. No fractures of the orbital walls or the paranasal sinuses were noted. However, a deficiency was noted in the lamina papyracea on the right-hand side, measuring 13.0×8.0 mm², with intrasinus prolapse of orbital fat through the defect (Figures 2 and 3). No bone fragment was noted in the region to suggest a fracture. There was evidence of mucosal disease in the right maxillary sinus. A final diagnosis of dehiscence of the lamina papyracea with orbital emphysema (right) was made.

It is most likely that the high air-pressures produced during violent sneezing produced mucosal laceration in the dehiscence area with escape of air into the orbital tissues.

The patient was given oral prophylactic antibiotics, nasal spray decongestants and advised against blowing the nose or straining (Valsalva manoeuvres). On re-examination after three days, most of the periorbital air had been resorbed. One week later there was no clinical sign of orbital emphysema. The patient was discharged and he remained asymptomatic on follow-up.

DISCUSSION

The medial orbital wall is formed partly by the frontal process of the maxilla, the lacrimal bone, and the lateral wall of the ethmoid bone, the lamina papyracea. Dehiscence of the lamina

Figure 1 Radiographs of the skull (Water's view and Caldwell's view) showing air density around the superior orbital margin on the right-hand side, suggestive of orbital emphysema.

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Figure 2 Panel of axial CT images (bone window) showing orbital and palpebral emphysema on the right-hand side. There is dehiscence of the lamina papyracea (arrow) with intrasinus prolapse of fat through the defect.

Figure 3 Panel of coronal CT images (bone window) showing orbital and palpebral emphysema on the right-hand side. There is dehiscence of the lamina papyracea (3rd image; arrow) with intrasinus prolapse of fat through the defect.

papyracea is an uncommon cause of orbital emphysema. Orbital emphysema in this condition may occur after any condition that increases nasopharyngeal pressure like after forceful nose-blowing, sneezing, coughing or vomiting, and scuba diving. Chronic mucosal disease may also weaken the lamina papyracea and lead to dehiscence secondary to elevated intranasal pressures generated from nose blowing.

In the case presented in this article, the orbital emphysema most likely occurred due to mucosal laceration at the dehiscence lamina papyracea with escape of air into the orbital tissues. This is the most common site of bony defect in this area and point of air entry into the orbit. The posterior limit of the dehiscence is always the basal lamella (bony attachment of the middle turbinate which separates the anterior and posterior ethmoidal air cells). The anterior limit is variable.⁸

The diagnosis of orbital emphysema is usually made by history alone, supported by results of external examination and confirmed with orbital CT.

Orbital emphysema can be extraconal (periorbital) or intraconal (intraorbital). Extraconal (periorbital) usually presents as sudden onset crepitant periorbital swelling. Subconjunctival

ecchymosis, pain and tenderness and proptosis can also be present. Clinical characteristics of intraorbital emphysema may be similar to those seen for a post-traumatic retrobulbar haemorrhage. There may be diplopia, ophthalmoplegia, and vision loss. Any visual acuity abnormality in the setting of orbital emphysema should be considered an ophthalmologic emergency.

The management depends on the emphysema extent and the severity of the symptoms. In all cases instructions must be given to the patient against nose blowing, sneezing, diving and flying and to refrain from performing a Valsalva manoeuvre for 7–10 days. Nasal mucosal congestion is prevented by administering topical epinephrine or similar drugs. In most cases of extraconal and intraconal orbital emphysema with minimal clinical and radiographic signs, no treatment is indicated and most cases resolve without active treatment. Observation is also the choice when patients appear with diplopia but no other visual problems. In all other cases, with reduction or loss of vision and ophthalmoplegia, surgical intervention is indicated in the form of lateral canthotomy/cantholysis and orbital decompression by needle aspiration, bony decompression, or

a combination thereof.⁶ Though the role of antibiotics is not definite, most reports have indicated the use of prophylactic antimicrobial therapy as it may be considered a contaminated trauma.^{5,9} Role of steroids is not clear. Regular follow-up is necessary until complete resolution.

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