Blowout Fracture of the Orbital Floor Secondary to Vigorous Nose Blowing

Abstract:
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Orbital floor fracture due to vigorous nose blowing in the absence of mechanical trauma is rare, only four cases having previously been reported. In each of these cases, predisposing factors have been identified, preceding URI in three and a history of sino-nasal surgery in the fourth case. We present the case of a 49-year-old woman who developed a maxillary sinus fracture and orbital emphysema after blowing her nose.

Introduction
Orbital floor fractures and maxillary sinus fractures usually occur as the result of blunt facial trauma. Facial bone fractures caused by abrupt changes in air pressure are rare. There are 4 previously reported cases of orbital fractures caused by vigorous nose blowing. This is the first case report of an orbital floor fracture in association with a maxillary sinus fracture occurring after nose blowing. There have been occasional reports of other complications following both sneezing and nose blowing. The raised intrathoracic pressure associated with sneezing has been associated with rib fracture, lung herniation, and aortic dissection. Sudden conductive hearing loss due to a stapled temporal bone fracture has also been described. The increased venous pressure which can result has also been linked to acute closed angle glaucoma and intracranial aneurysm rupture.

Case Report
A 49-year-old woman presented with left sided facial swelling, tenderness and periorbital haematoma of sudden onset after blowing her nose. Her visual acuity and facial nerve function were unaffected. There was no loss of sensation in the distribution of the infraorbital nerve. She gave a history of trauma to the left side of the face approximately 10 years prior to presentation but no facial bone fractures were noted at the time. In addition, she had been suffering from a frontal headache for several days prior to the facial fracture. This had been treated as sinusitis with an over the counter analgesia. The patient had no other medical history and was not on any regular medications. Following facial bone radiography demonstrating a fluid level in the left maxillary sinus, computed tomography of the facial bones was performed revealing a fracture of the left orbital floor and lateral wall of the left maxillary sinus. She was offered operative repair of her facial bone fractures but declined this and elected to be managed conservatively with oral co-amoxiclav.

Figure 1: Posterior-Anterior view of the facial bones demonstrating a fluid level in the left maxillary sinus and a fracture of the lateral wall. There is associated soft tissue swelling over the inferior border of the left orbit.

Figure 2: Coronal non-contrast computed tomography of the facial bones showing a fracture of the orbital floor and the infero-lateral wall of the maxillary sinus.

Discussion
In normal subjects, sneezing raises the intra nasal pressure significantly (up to 8.4mmHg), but the intranasal pressure developed during nose blowing can be up to 9 times this (75mmHg). Direct fluid transfer between the nasal cavity and the paranasal sinuses during nose blowing has been demonstrated radiologically unsuspecting that facial bone fracture could result from nose blowing. It is not clear if the pressure causing such fractures is transmitted intranasally and thus fractures the orbital wall or if the fracture results from increased intranasal pressure transmitted to the lamina papyracea. One theory proposed to explain the mechanism of many orbital fractures is the hydraulic theory and states that blow out fractures can be caused by raised intra-ocular pressure transmitted through the orbital floor. The mechanism of injury may be slightly different in the case we have described. In this case the fracture may have been caused by raised intranasal pressure directly transmitted into the sinus, thus accounting for the injury centered on the maxillary sinus.

It is well established that the sinus wall thins with age, however only one of the cases described in the literature occurred in an elderly patient, and the subject in the above case was aged only 49. It is proposed that chronic inflammation of the sinus wall and associated hyperaemia may lead to localized osteomalacia thus weakening the sinus wall. Both prior predisposing factors such as sinusitis have been identified as contributing factors in cases such as this. Additionally, intranasal pressure during nose blowing has been shown to be significantly higher in subjects with chronic sinusitis than in normal controls, a finding which lends credence to the above theory.

In conclusion, we present a case of spontaneous facial bone fracture as a result of vigorous nose blowing. Symptoms of severe facial pain or swelling following sneezing or nose blowing should be taken seriously and investigation with computed tomography should be considered.

References: