Case Report

Non-axial proptosis secondary to pneumosinus dilatans of the maxillary sinus

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Abstract

Pneumosinus Dilatans (PD) is a rare condition characterized by abnormal enlargement of one or more paranasal sinuses that can lead to different functional and cosmetic presentations. Here we report right non-axial proptosis in a 47-year-old female secondary to pneumosinus dilatans of the maxillary sinus with superior bowing of the orbital floor.

Keywords: Proptosis, Maxillary sinus, Pneumosinus dilatans, Orbital floor

Introduction

Proptosis is one of the main presentation of different orbital pathologies. Occasionally paranasal sinus abnormalities may present with proptosis. Here we report right non-axial proptosis in a 47-year-old female secondary to pneumosinus dilatans of the maxillary sinus with superior bowing of the orbital floor.

Case report

A 47-year-old female presented to the oculoplastics clinic complaining of eye asymmetry with upward deviation of right eye that was first noticed 20 years earlier. The patient denied having facial pain, nasal obstruction, nasal or postnasal discharge, loss of vision, or double vision. There was no history of trauma. The patient is not known to have any medical disease or previous surgery.

On examination, her visual acuity was 20/20 in each eye with no relative afferent pupillary defect. Extraocular movements were normal in both eyes. Intraocular pressure (IOP) was 15 mmHg in both eyes. There was hyperglobus of right eye manifested as pseudoptosis. There was 4 mm of non-axial proptosis in the right eye (Fig. 1). There was no lagophthalmos in either eye. Anterior segment and fundus examinations were within normal limits bilaterally. Nasal endoscopy was normal.

The initial impression was a space-occupying lesion beneath the globe, either in the orbit or in the maxillary sinus. Subsequently, orbital computed tomography (CT) was performed which showed hyperaeration of the right maxillary sinus with superior bowing of the orbital floor without evidence of other sinuses pathology bilaterally apart from retention cyst in the left maxillary sinus (Fig. 2). No orbital masses or fractures were identified bilaterally. Magnetic resonance imaging (MRI) of the orbit was not performed. The patient...
was offered endoscopic sinus surgery for a right maxillary antrostomy and partial orbital floor removal, however, she preferred to clinically observe her condition for now.

Discussion

Pneumosinus Dilatans (PD) is a rare condition characterized by abnormal enlargement of one or more paranasal sinuses that can lead to significant deformity of the overlying bone and surrounding soft tissue. The precise etiology and pathogenesis of PD remain obscure.1,2 Several mechanisms have been proposed for PD: the presence of spontaneously draining mucocele, dilatation by gas-forming microorganism, the presence of a one-way valve and previously unrecognized congenital malformation.3 The one-way valve theory seems to be the most convincing explanation. This theory has been tested by Wolfersberger who measured the antral pressure before and after Valsalva’s maneuvers on patient with pneumosinus dilatans of the maxillary sinus. The experiment revealed higher antral pressure on the affected sinus after maneuver and the pressure remained elevated for several minutes.4

Pneumosinus dilatans can affect all paranasal sinuses. Most frequently affected sinuses are the frontal sinus (63%), the sphenoid sinuses (24%), and the maxillary sinus (20%) with the ethmoidal sinus being least commonly involved (19%).5 The commonest presenting complaint of patients with PD the maxillary sinus is cosmetic in nature. Other complaints including facial pain or pressure (worsen by nose blowing or sneezing), nasal obstruction, otalgia, hearing loss, orbital displacement and proptosis.5–7 Patients with PD of the maxillary sinus have 56% chance of having associated condition at the time of diagnosis. The conditions most commonly associated are vision loss (20%), arachnoid cysts (8%), and orbital tumor (4%).5

Computerized tomography (CT) scan are diagnostic for maxillary PD. The typical findings on CT scan include hyperpneumatization of the maxillary sinus with massive dilatation, medial displacement of a membranous medial maxillary wall, superior displacement of the orbital floor and thinning of the zygomatic bone.8 Moreover, CT scan can be utilized to rule out orbital or maxillary masses that may mimic the presentation of maxillary PD.

Treatment of PD of the maxillary sinus consists of creation of a naso-antral window endoscopically.8,9 Although, naso-antral window may be effective in relieving the symptoms, the deformity may persist. Hence, partial removal of the orbital floor is recommended specifically in patients presenting with a complaint of cosmetic nature.3,8

In conclusion, we reported a case of pneumosinus dilatans of the maxillary sinus causing orbital floor displacement in otherwise healthy female. Although this is a rare differential
diagnosis of a maxillary disease, PD of maxillary sinus should be considered in patients with non-axial proptosis.

Conflict of interest

The authors declared that there is no conflict of interest.

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