

## Pressure-induced expansion of the maxillary sinus. A rare entity

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### INTRODUCTION

Bony wall distension of the frontal and the ethmoidal sinuses is a rare entity and mostly seen in cases of mucocele (Ohnishi et al., 1982). Another disorder, pneumosinus dilatans - possibly of endocrine genesis, involves frontal sinuses unilaterally (Bourdial, 1970). In the maxillary sinus, mucocele and other non-malignant expanding deformities are extremely rare (Natvig and Larsen, 1978). The present report demonstrates other etiologies for an expansion of the antrum. In one case the expanding antrum was seen as a complication of a septoplasty operation.

### CASE REPORTS

#### *Case 1.*

A 26-year-old man was admitted to the ENT-Department with the history of recurrent episodes of right-sided facial pain and nasal discharge since one year. A

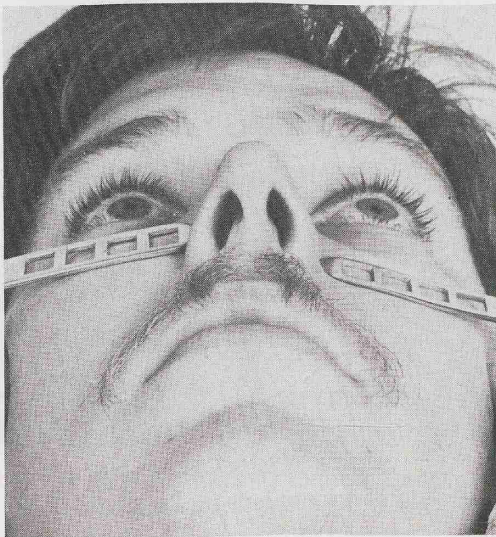


Figure 1. Protruding right cheek of the 26-year-old man in case 1.

single choanal polyp was recognized on the same side, as well as a bony protrusion of the cheek (Figure 1). Radiography revealed complete antral attenuation and a thin protruding anterior wall of the sinus. At a following antrostomy, the sinus cavity was found filled up by two serous cysts, one of them expanding through the ostium where the stalk continued into the choanal polyp. The second cyst, attached to the antero-lateral aspect of the bony wall, had expanded without destruction of the bony wall. One year following extirpation of the cysts and the polyps, the sinus was aerated, but the bony protrusion still remained.

#### *Case 2.*

A 25-year-old man, who had had an uncomplicated septoplasty because of septal deviation to the left returned to the department one year following surgery due to left-sided facial pain and increasing nasal obstruction. The left nasal cavity was found almost occluded by the lateral wall bulging into the nasal cavity. When blowing his nose, a strong facial pain usually appeared, which could last for some hours or even a day. This problem had started two months following surgery. Sinus tomography revealed an enlarged but otherwise healthy left antrum. The aerated cavity reached into the root of the zygomatic arch, into the ethmoidal region and down between the premolar roots (Figure 2). This finding was in



Figure 2. Tomogram of the maxillary sinuses. Left sinus enlarged and filled with air. Most of the left nasal cavity and ethmoidal sinus are incorporated and a slight bulging upwards of the orbital floor is demonstrated.



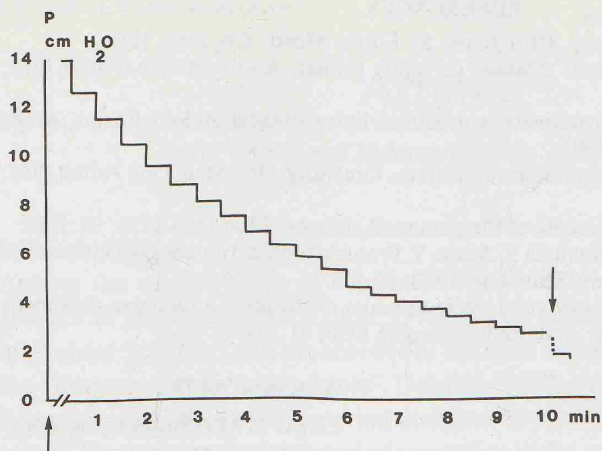


Figure 3.  
Pressure recording from the left maxillary sinus following a moderate blowing of the nose ( $\uparrow$ ). There is a gradual decline in pressure. This is further decreased following a rapid inspiration through the nose ( $\downarrow$ ).

bright contrast with the X-ray picture taken immediately before the septoplasty. The intrasinusoidal pressure was measured via a Lichtwitz needle introduced into the maxillary sinus through the wall of the lower meatus. The needle was attached via a polyethylene tube to an electromanometer. Pressure-changes were recorded stepwise on a X-Y recorder every 30 second (Measuring range 0-30 cm H<sub>2</sub>O). The pressure-curve in Figure 3 shows the high pressure built up when blowing the nose and the slow equilibration of this pressure. Obviously, there was an ostial valve acting. An antral volume of 50 ml was measured by instillation-reaspiration of saline, which should be compared with the volume of his healthy antrum that was 14 ml. By antral trepanation and by fracturing and restoring the bulging medial maxillary wall to its normal position, all complaints disappeared. Radiographically, however, the sinus had not essentially diminished in size one year after the operation.

#### COMMENTS

Enlargement of the maxillary sinus may be due to malignant tumours (Sonesson, 1950) or to dental cysts (Mårtensson, 1955). The cause of deformation of the bony walls in dental cysts is a longstanding pressure acting on the periost and it is well-known that chronic pressure on periost causes osteoclastic and osteogenic activity, leading to rebuilding of the bone (Cushing, 1922; Andersson, 1961). The cases reported here, seem to share this mechanism, but the etiologies differ. In the present two cases the primary problem seems to depend on the occlusion of the maxillary ostium. However, protrusion of the bony walls of the maxillary sinus should hasten the diagnostic efforts to exclude malignancy. In case of benign expansion, measures should soon be taken to prevent further development, since the cosmetic defect seems to remain.

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