

## Radiological and endoscopic study of the maxillary sinus in primary atrophic rhinitis

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### Abstract

The maxillary sinuses of 40 patients suffering from primary atrophic rhinitis (ozaena) were studied radiologically, antroscopically and histopathologically. Sixty per cent of the patients showed thick bony walls and a small cavity of the maxillary sinus on X-ray and on antroscopy. On the other hand, 25 per cent of the cases revealed signs of infection including mucopurulent secretion on antroscopy associated with corresponding histopathological changes. It is concluded that poor pneumatization of the antrum plays a more important role in the pathogenesis of ozaena than infection.

### Introduction

Primary atrophic rhinitis (ozaena) is a common disease in developing countries. The exact aetiological cause is still controversial and different theories have been postulated to explain its pathogenesis. Girgis (1966) supported the presumption that ozaena occurs as a result of excessive patency of the nasal cavities in relation to the shape or type of skull. Wachsberger (1934) and Pesti (1949) attributed the cause to poor pneumatization of the antrum with compensatory wide nasal fossae. On the other hand, El-Barbary *et al.* (1970) supported the belief that ozaena is the result of a chronic purulent focus in the nasal cavity or accessory sinuses. Eggston and Wolff (1947) considered that all cases of primary atrophic rhinitis are due to chronic infection.

The aim of this work was to study the maxillary antrum radiologically and antroscopically and the antral mucous membrane histopathologically in cases of primary atrophic rhinitis in order to assess the validity of the previous suggestions.

### Patients and methods

This work included 40 patients suffering from primary atrophic rhinitis. History taking and clinical examination was carried out for every patient to exclude cases of secondary atrophic rhinitis. A biopsy was taken from the inferior turbinate to confirm the clinical diagnosis and to exclude secondary atrophic conditions.

The patients were investigated by:

- (i) Radiological examination of the paranasal sinuses (lateral and occipito-mental views).
- (ii) Antroscopy of cases showing opacity of the maxillary sinus on X-ray. Accordingly, antroscopy was performed on 22 patients under local anaesthesia via the canine fossa route using a Storz rigid endoscope.

Biopsies were taken from the sinus mucosa via the antroscope cannula for histopathological study.

### Results

#### (i) Radiological findings

Opacity of the maxillary sinus was found in 22 patients, most of them showing bilateral opacity; the remaining 18 patients had bilaterally clear maxillary sinuses.

Pneumatization of the paranasal sinuses appeared to be generally reduced. Twenty-four patients (60 per cent) had small maxillary sinus cavities, nine patients (22 per cent) had moderate sized cavities and seven patients (18 per cent) had more or less normal sized cavities. The extent of the anteroposterior pneumatization of the maxillary sinuses was reduced in 80 per cent of cases (Fig. 1).

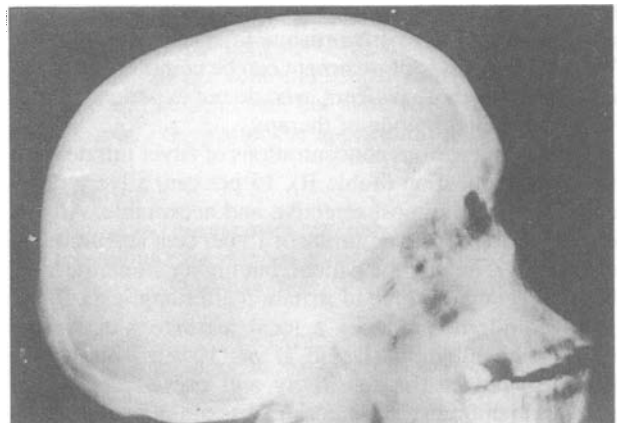


FIG. 1

Sinus X-ray (lateral view) in a case of ozaena showing reduced antero-posterior pneumatization of the maxillary sinus.

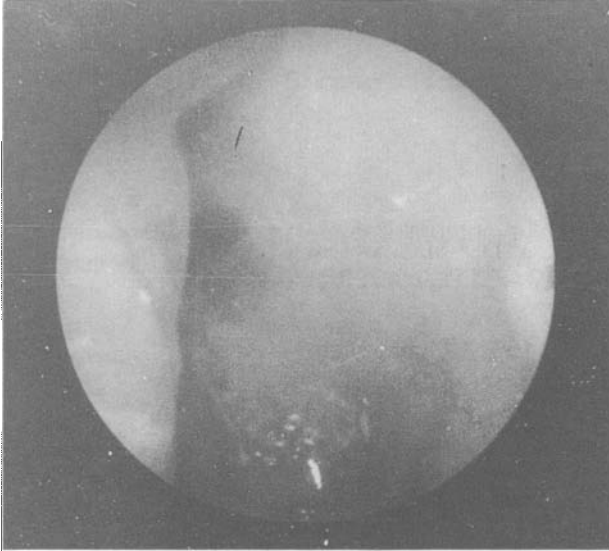


FIG. 2

Antroscopy showing small sized cavity of the maxillary sinus.

### (ii) Antroscopy findings

Of the 22 patients who underwent antroscopy, difficulty in piercing the bony wall of the canine fossa was experienced in 12 patients suggesting a thick bony wall. Mucopurulent secretion in the antrum was recorded in seven cases. The secretions were usually small in amount, viscid and greenish in colour. The cavity of the antrum was found to be small in size in almost all the cases (Fig. 2).

### (iii) Histopathological findings

Squamous metaplasia in different stages of development was noticed in the epithelium of most of the 22 cases examined. Nine cases showed round cell infiltration of the tunica propria, formed mainly of lymphocytes and plasma cells together with fibrosis (Fig. 3). The other 13 cases showed absence of such inflammatory infiltrate.

## Discussion

Radiological study of cases of primary atrophic rhinitis revealed that 18 patients had clear maxillary sinuses denoting absence of infection. Twenty-two cases had radiologically opaque maxillary sinuses. Further examination of these cases by antroscopy and biopsy showed that the sinus mucosa was infected in nine cases with mucopurulent secretion in seven. The other 13 cases had clear maxillary sinuses with their mucosa free from infection histopathologically. This leads us to the finding that of the 40 cases studied, only nine (22 per cent) showed signs of infection in their maxillary sinuses.

The opacity demonstrated radiologically in non-infective maxillary sinuses is due to considerable thickening of the walls of the maxillary sinuses. In addition 80 per cent of cases showed a decrease in all dimensions of the maxillary sinus and a decrease in its luminal capacity. Antroscopy findings, including difficulty in piercing the bony wall of canine fossa and the small antral cavity encountered in most of the cases, support the radiological findings and indicate arrest of pneumatization.

In agreement with our results, Ssali (1977) reported that

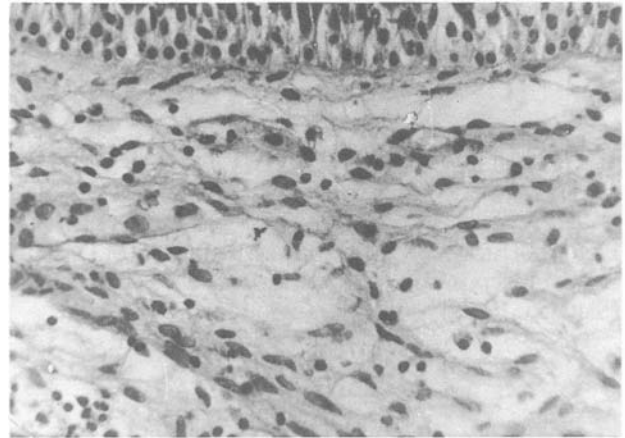


FIG. 3

Maxillary sinus mucosa in a case of ozaena showing round cell infiltration denoting infection.

in 28 out of 35 patients of ozaena studied, the sinuses were free from infection. He added that the walls of the sinuses were found to be thick thus making antral puncture and lavage difficult. The findings of the present work were also in accordance with the results of James (1965) who attributed the radiological findings in primary atrophic rhinitis to failure of pneumatization.

In the present study, antroscopy revealed antral secretion in seven cases. The secretion was always small in amount and in the form of a mucous plug of greenish colour similar to the nasal discharge of atrophic rhinitis. The sinus mucosa presented the same histopathological changes which occur in atrophic nasal mucosa. This had been noticed by Girgis (1966) who reported that sinus mucous membrane shares in the same atrophic changes with loss of cilia and mucous cells as nasal lining with the exception that no scales accumulate on its surface.

It is concluded from the present work that poor pneumatization of the maxillary antrum plays a more significant role in the pathogenesis of ozaena than infection.

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