

Pathological changes of the nasal mucosa after surgical treatment of atrophic rhinitis

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SUMMARY

This pathological study done pre and post operative to surgical treatment of cases of atrophic rhinitis by submucous implantation of chromic catgut IV, gives good evidence that this technique gives encouraging results, not only by narrowing the nasal cavity but also by regeneration of the epithelium to the normal shape.

INTRODUCTION

Atrophic rhinitis is not a very rare disease in Egypt. It is a chronic nasal disease characterised by progressive atrophy of the mucosa and underlying bone of the turbinates and the presence of crusts in the nose which cause a characteristic foul odour called ozaena (Stench). It is also characterised by normal patency of the nasal passages.

The aetiology of primary atrophic rhinitis is not known for certain. Many organisms could be found in cultures, as coccobacillus, bacillus mucosus, coccobacillus foetidus ozaena, diphtheroid bacilli and klebsiella ozaena, but there is little evidence that they cause the disease.

Secondary atrophic rhinitis results from rhinoscleroma, syphilis, excessive operative destruction of nasal mucus membrane.

Pathologically there is metaplasia from columnar ciliated to squamous epithelium. There is a decrease in the number and size of the compound alveolar glands. There are two types of atrophic rhinitis:

Type 1, characterised by end-arteritis and periarteritis of the terminal arterioles, which is the result of chronic infection.

Type 2, in which there is vasodilatation of the capillaries.

Medical treatment was tried in some cases, Rosen (1952) used nicotinic acid. Soskin (1939), Stern-Stein (1951) used oestrogen, prostigmine, histamine, priscoline and niacin. Various surgical methods for treatment have been advised. These in-

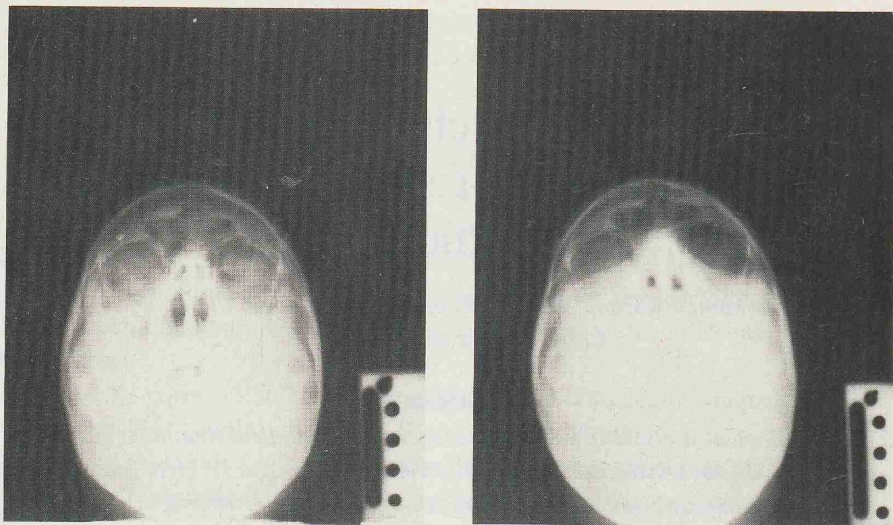


Figure 1.

- a. X-Ray picture of the skull showing wide nasal cavities before the operation.
- b. Post operative, thickening of the floor of the nose and the lateral nasal wall and narrowing of the nasal cavities.

clude submucous injections of paraffin. Operations aimed at displacing the lateral nasal walls medially (Lautenslager's) operation. More recently teflon strips, polythene and cartilage have been inserted after flaps of mucoperichondrium, and mucoperiosteum were raised from the septum, floor, and lateral walls of the nose. Wilson (1964) has reported good results from the submucosal injection of a suspension of powdered teflon in 50% glycerine paste.

Repeated stellate ganglion blocks have been employed with some success by Sharma and Sardana (1966). Encouraging results have been obtained following the closure of one or both nostrils by plastic surgery by Young (1967).

In a previous trial (1977), we tried to put chromic catgut IV between mucoperichondrium and mucoperiosteum and the floor of the nasal passages, lateral wall of the nose and lower part of the nasal septum. Radiograms done six months after the operation showed thickening of the floor of the nose and the lateral nasal walls and narrowing of the nasal cavities. (Figures 1a and b).

MATERIAL AND METHODS

This series included 20 patients, 15 females and 5 males. The age of the patients was between 20–35 years. Cases of primary atrophic rhinitis fit for operation were chosen. Under general anaesthesia the approach was performed through a horizontal sublabial incision exposing the pyriform aperture. Elevation of mucoperi-

riosteum and mucoperichondrium was made over the floor of nasal passages and the lateral wall of the nose and over the lower part of the nasal septum. Chromic catgut IV ranging from 10–20 according to the width of the nasal cavity, was used to narrow the nasal passages. Biopsies from the nasal mucosa over the inferior turbinate were taken before and six months after the operation. The specimens removed were fixed in formalin and stained routinely by hematoxylineosin.

RESULTS

Examination of the nasal mucosa of cases of atrophic rhinitis before the operation showed in some cases thin atrophic epithelial layer which is partially desquamated in some areas, and in other areas the normal pseudostratified columnar ciliated epithelium is replaced by only one layer with atrophy of the goblet cells. (Figure 2). In other cases the normal epithelium changed to stratified squamous epithelium. (Figure 3). The subepithelial tissue or the lamina propria is extensively infiltrated by chronic inflammatory cells, lymphocytes, plasma cells and slight histiocytes. The normal excessive venous channels which are normally present in the lamina propria disappeared, and the arteries showed fibrosis with thick wall and narrow lumen. (Figure 3).

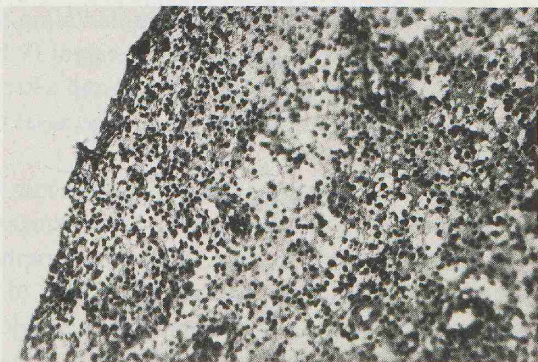
Figure 2.

- a. Desquamated epithelium.
- b. One layer of low columnar non ciliated epithelium.
- c. Atrophic glands.



Figure 3.

- a. Stratified squamous epithelium.
- b. Thickened sclerosed blood vessels with narrow lumen.



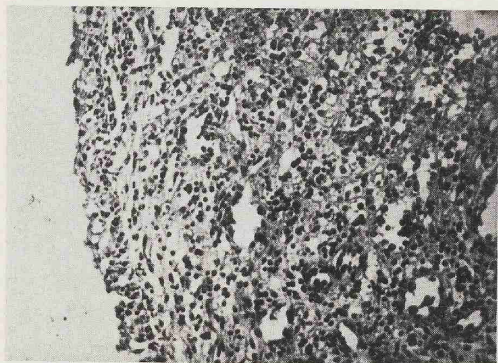


Figure 4. Regenerating epithelium (Stratified columnar) with goblet cells.

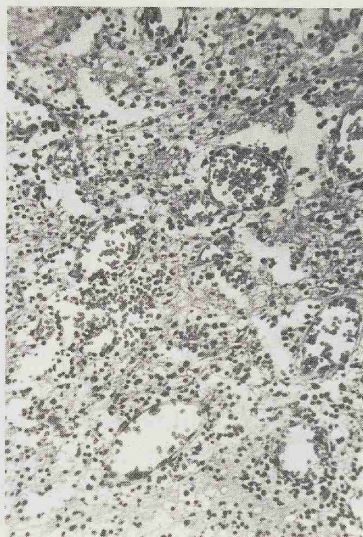


Figure 5. New formed capillaries and mild amount of inflammation around.

Examination of the nasal mucosa of cases of atrophic rhinitis six months after the operation showed that the epithelium is of stratified columnar type with few goblet cells. (Figure 4). The lamina propria shows extensive vascularization and newly formed capillaries (Figure 5). The inflammatory cells also decreased in number as shown in Figure 5.

DISCUSSION

Most of the surgical operations are based on narrowing of the nasal passages, either by displacing the lateral nasal walls medially (Lautenslager's operation), or by submucous implants of cartilage, polythene and teflon strips on the lateral wall floor and nasal septum (Wilson, 1964), or by reducing the flow of air through the nose by approximating the edges of skin of vestibule with interrupted silk sutures (Young, 1967), or by submucous implantation of dermofat graft, (Girgis, 1966). Submucous implantation of chromic catgut IV by Alhady (1977) has the advantage of being easily available in Egypt and when used in big quantities, it stimulates fibrosis and hence narrowing of the nasal passages, as shown in Figures 1a and b.

Pathological examination of the nasal mucosa before and six months after the operation is done to show the possible changes in it. Before the operation the nasal mucosa shows in some cases thin atrophic epithelial layer and in others stratified squamous epithelium. This is due to diminished blood supply of the mucosa by thickening of the walls of the arteries in the lamina propria and narrowing of its lumen, leading to ischaemia with consequent changes of the over-

lying epithelium (Figure 2). Ruskin (1942), Taylor and Young (1961) considered atrophic rhinitis due to an inflammatory process which produced an endarteritis and periarteritis of the terminal arterioles.

Postoperative nasal mucosa showed evidence of regeneration of the epithelium which started to take the stratified columnar form, with regeneration of goblet cells. It must be mentioned that on one case the result was unfavourable due to perforation of the nasal mucosa. Another case developed dacryocystitis.

RÉSUMÉ

Cette étude pathologique faite avant et après le traitement opératoire chirurgical de cas de rhinite atrophique par une implantation sub-muqueuse de catgut IV chronique donne de bonnes preuves que cette technique donne des résultats encourageants pas seulement en retrécissant la cavité nasale mais aussi par la régénération de l'épithélium à une forme normale.

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