Clinical records

Atrophic rhinitis

A new curative surgical treatment (middle turbinectomy)

By C. L. Ssali (Mulago, Uganda)

Atrophic rhinitis has been stated to be a disease prevalent among the poor or malnourished individuals. Hence it is found less and less frequently in more developed countries while it is common in developing ones. This disease has also been thought to be related to hormonal deficiency and oestrogens have been used for its treatment. Atrophic rhinitis or ozaena is a chronic nasal inflammation causing severe disability to the sufferer. In advanced cases the patient emits foul breath through the nose. There is a crust formation on the middle and inferior turbinates causing obstruction to breathing. Although the patient has a nauseating smell in his nose, yet, mercifully he does not smell it himself. This is because of the atrophic changes in the olfactory area and also the partial blockage of the nose by the middle turbinate crusts.

Aetiology of this disease is unknown and so is the treatment.

Hormones: Patients seen in this clinic with this condition had no trace of hormonal imbalance. Females had normal feminine features and some had families. The male patients were likewise normal.

Nutrition: This condition has been found common in a tribe whose main diet is milk and cheese (Bahima of Ankole) in Uganda.

Infection: An infection transmitted by contact or passively by flies has been much suspected in this investigation. The prevalence of this condition among the Bahima who are cattle owners and are constantly in contact with flies, supports the theory. Furthermore, they have limited facilities for medical care.

I have personally seen a family of seven children all suffering from atrophic rhinitis. The parents who were free from the disease themselves told the story that one child came and stayed with the family and this child had a smelling nose. The children in this house had never had such an affection. A year later they had to send away this child when they found to their dismay that two of their children had contracted the disease of crusting and smell in the nose. These two children passed it on to the other two. Three children were born later and they too got this disease. The eldest daughter was 17 years and the last born was 8 months old. They all had atrophic rhinitis with the typical atrophic changes and foul smelling crust formation. There was no malnutrition in anyone. The youngest was still breast fed and showed normal development. They all had one common feature and that was abnormally large middle turbinates that obstructed the nasal roof.

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One cannot rule out a hereditary tendency in the disease infective process. In such cases a simple rhinitis which receives quick attention among the well-to-do is neglected and establishes as a chronic rhinitis with disastrous consequences. In the opinion of the author, that is why the disease is found less frequently in well-to-do societies while prevalent among the poor and less-developed countries.

Sinuses: In twenty-eight of our cases the sinuses were found free from infection. The walls of the sinuses were thickened and made antral washout difficult. The ethmoids and maxillary sinuses were mostly undersized. It was thought that development was retarded as a result of the inflammatory process involving the nasal mucosa from which they develop. In some cases the frontal sinuses did not develop at all where disease started before the age of 5 years.

Microbiology: In this investigation a Klebsiella Ozaena has been repeatedly isolated. Its role in this disease is not confirmed but we are in the process of investigating the part it plays. It has been found to follow in the footsteps of Pneumococci which initiate the inflammatory process.

Klebsiella Ozaena—Staphs Aureus—Pneumococci were commonest organisms found in cases of atrophic rhinitis.

Drugs effective: Sensitivity tests showed Ampicillin, Streptomycin, Tetracycline to be effective. In established cases of atrophic rhinitis, antibiotics did not eradicate the infection or reverse the process by themselves. Despite guidance by sensitivity tests the results of antibiotic treatment have not been satisfactory. However, if combined with surgery, the recovery period may be shortened.

(1) *Washing the nose with saline* helps to remove crusts, but they reform within 24 hours.

(2) *Hormones:* Oestrogens have been administered locally but the occasional improvement has been only temporary.

(3) *Surgery:* Grafts of polythene or bone have been used by many surgeons all over the world in an effort to narrow the nasal cavity which in this condition is wider than normal as a result of atrophic changes in the turbinates. Some of these cases have been reviewed and followed up in this investigation, but the results found unsatisfactory in this operation.

Recently some investigators elsewhere found that closing off the nose for five to seven years gave good results; that is, on opening of the nose they found no trace of the disease. (Young, 1967.)

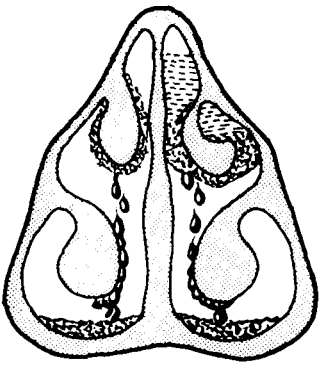
Here in Mulago, a new and different surgical approach has been used in this trial and the results have been very encouraging. This involved the removal of the middle turbinates. As earlier stated, these turbinates in most cases are found to cause a degree of obstruction to the free drainage of the ethmoidal region. The secretions from the ethmoidal air cells get trapped here causing stasis and infection follows. This rhinitis if not treated becomes chronic and the pus irritation starts the atrophic changes. (See Figs. 1, 2 and 3.)

Under general anaesthetic with endotracheal tube, the nose is packed with ribbon gauze soaked in 10 per cent cocaine and adrenaline. This measure reduced haemorrhage at operation.

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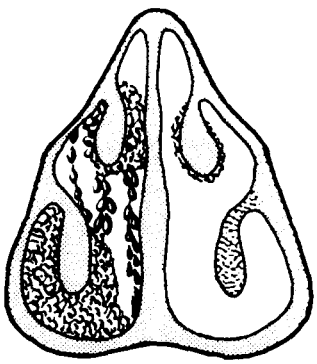
The middle turbinates are removed using forceps. There is no need for doing an ethmoidectomy. The nose is then packed with BIPP gauze ribbon or one soaked in liquid paraffin. The pack is removed after 24 hours.

Patients may be discharged home after seven days following operation. They attend the outpatient clinic weekly to have crusts removed. At home they douche the nose with saline. After a period of about two or three months they



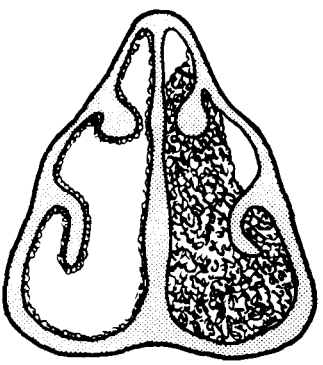
Early stage – Little smell crusting mainly on middle turbinate. Inferior turbinate small crust

FIG. 1.



Advanced stage – Large crusts
Foul smelling
Small ulcerated turbinates

FIG. 2.



Late advanced – Tiny inferior turbinates.
Very wide nostrils
Large sticky crusts
Nasal mucosa ulcerated and haemorrhagic

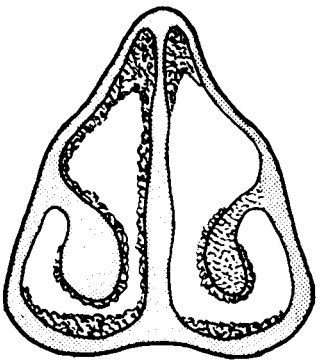
FIG. 3.

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attend at longer intervals as at this time most of them have no crusts but thick mucus and the smell had disappeared. (Figs. 4, 5, 6 and 7.)

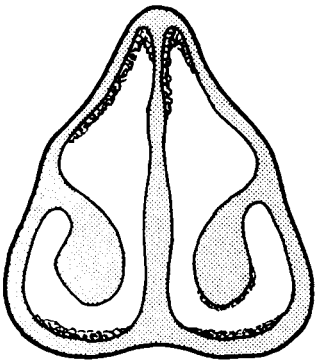
This operation has been carried out on 35 cases during the past three years with an average follow-up of 24 months. The criteria of improvement were:

(1) No smell
(2) No crusts
(3) Turbinates return to normal appearance
(4) Restoration of sense of smell sometimes
(5) Cessation of headaches.



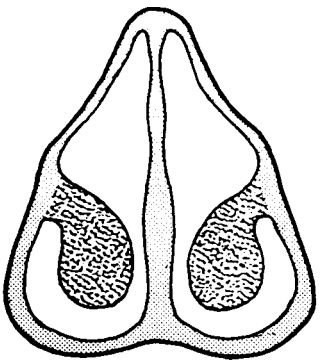
2 Months after operation
Crusts still forming
Smell present

FIG. 4.



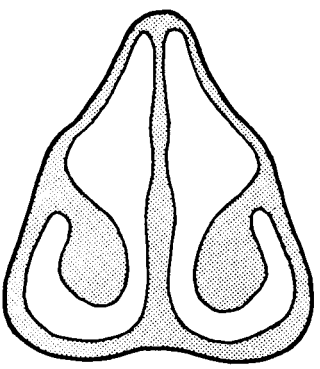
Larger turbinate with small crusts.
6 months after operation
Very little or no smell

FIG. 5.



12 Months after
Middle turbinectomy
No crusts – mucus shreds only
Large inferior turbinates
No smell

FIG. 6.



Final stage
Healing complete
Clean nasal mucosa

FIG. 7.

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Out of the 35 patients operated on, 32 had good results, fulfilling the above criteria. Their time of improvement varied according to how advanced were their atrophic changes. The early ones took a shorter time than the advanced ones. (Figs. 8 and 9.)

No. operated on	Improved	Failed
35 patients ..	32 (91%)	3 (9%)

FIG. 8.

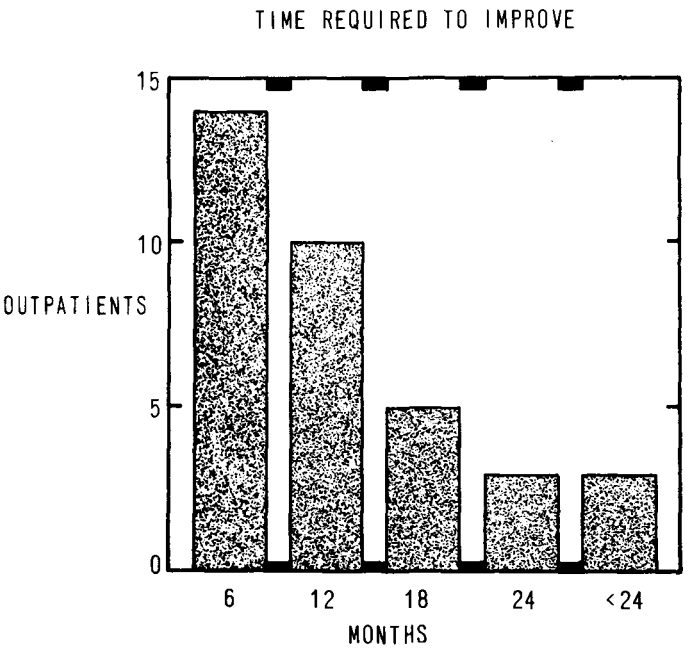


FIG. 9.

Out of the failures one was not reviewed but the other two were very advanced to start with and have shown only slight reduction in the crust formation tendency.

Discussion

The most important observation that led to this investigation was the anatomical features of the middle turbinate in cases of atrophic rhinitis. These turbinates are normally well defined spongy tissue occupying a specific region on the lateral wall of the nose. Ideally there should be free air space on either side of the turbinates which enables free air flow on either side of the over-hanging turbinate. There should also be free flow of the secretions of the mucus glands of the nasal mucosa and the ethmoidal air cells situated lateral and above them. In cases of atrophic rhinitis and especially in the early cases this situation seems to be different. The roof of the nose is crowded and as a matter of fact obstructed by what is usually a granular middle turbinate, causing stasis of

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secretions from ethmoidal sinuses and later infection. Their surfaces are covered with mucopus and small early crusts. It can be easily observed that pus drips from these regions assisted by gravity to the inferior turbinate which gets covered in this fluid mucopus. Whereas in the early cases mucopus may be found confined to the region of the middle and superior turbinates, one hardly ever finds pus confined to the inferior turbinate without the involvement of the middle. It can be deduced that this pus that gets deposited on the inferior turbinate starts a chronic irritation and inflammation that leads to metaplasia of the surface epithelium from the normal mucus propelling ciliated respiratory type to a flat squamous epithelium. It is this type of epithelium which has lost the power to propel mucus that promotes the formation of crusts. The mucus which collects and remains stagnant gets infected and loses part of the moisture during respiratory air exchange and forms hard foul-smelling crusts. Since the flow of mucus in such a nose is only dependent on gravity, the crust that forms in advanced cases assumes the cast of the nostril. The longer the crust remains in place the greater the damage to the mucosa leading to ulceration, bleeding and subsequent scarring with the well-known atrophic change that reduces the size of the spongy tissue and goes on to involve the bony part of the turbinate. This has been observed histologically with evidence of increased osteoclasts, alkaline phosphatase and endoarteritis. (Smith, 1968; Henriksen and Gundersen, 1959.)

With this observation it was postulated that the only way to halt this destructive force was to remove the source of pus by creating a free drainage of the nasal roof in the region of the superior and middle turbinate where stasis of secretions has led to pus formation. This would stop the irritating pus from reaching the inferior turbinate which in early cases may be relatively normal underneath the crust. In advanced cases where the epithelium has been damaged it was thought possible that islets of normal ciliated epithelium on the inferior turbinate would enable normal epithelium to regenerate and cover the scarred areas and restart their normal function of propelling the mucus back if the perpetuating factor was stopped. Once this state is achieved, the crusts should stop forming and the smell would disappear. The turbinate would get increased vascularity and return to normal size and function. It is well known that the inferior turbinate is the most important and even total removal of the middle turbinate creates no noticeable disability (Wilson, 1964).

Case history

The first case that was done was a young girl of 14 years, Ankole by tribe. She was first seen in August 1967. She had left school because of her smelling nose. Nobody could keep her company and because of this she kept on her own and later gave up schooling altogether.

She looked well-nourished and being of Ankole tribe who are cattle breeders never lacked milk, which in fact forms the bulk of their diet. Her nose had massive crusts that enveloped the middle and inferior turbinates in both nostrils. The smell was typically foul with greenish pus appearing at the nasal vestibule causing crusting and ulceration in the region of the upper lip. This latter cleared up and the nose was free from crusts and smell in six months after operation, using the new technique.

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Case 2. A prisoner serving a 7-year sentence for murder case was included in this series. He gave a history of eight years of foul-smelling breath and headaches. He was found to have advanced atrophic rhinitis. His wife had deserted him because of the bad smell and she had got herself a new lover. He ambushed the man and stabbed him as he sneaked into his wife's room. The man, in court, decided to plead guilty with the aim of getting himself hanged. He was so disgusted with his illness that although he was sentenced to 7 years imprisonment he preferred to hang. While in prison he was brought to hospital for treatment. After investigations a middle turbinectomy was done. Within eight months he had no more crusts and no smell. He expressed the hope to be reconciled with his wife after serving the sentence now that he did not have the foul smell in the nose.

Complications: During operation care must be taken as one may break through the cribriform plate and cause meningitis. In these cases the area is atrophic and thinner than usual. One of our cases had this complication and recovered only after intensive chemotherapy.

Summary

No definite aetiology and treatment is known for atrophic rhinitis. A new surgical treatment has been used with reasonable success in 35 cases of atrophic rhinitis by the author.

Abnormally large middle turbinates causing stasis to normal secretions of the nose and sinuses predispose to persistent nasal infection especially where medical facilities for prompt treatment are lacking, leading to chronic nasal suppuration and subsequent atrophic rhinitis. Cases have been cited to prove the theory.

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