

A Clinical Study on Atrophic Rhinitis, Its Management and Surgical Outcome

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Abstract

Objective: To study the efficiency of surgical management for atrophic rhinitis, to study the complications following surgeries and to study the quality of life following the management in 82 patients.

Materials and Methods: A prospective study of 82 patients who were treated for atrophic rhinitis in tertiary care hospital at the coastal Karnataka of South India for the past 3 years were carried out. Details of treatment either the medical management or the surgical procedures and any associated complications thereafter are noted. The symptomatic and clinical improvement of the patients at 3 months, 6 months and at 1 year of follow up was noted.

Results and Analysis: Total of 82 patients with atrophic rhinitis was studied with age ranged from 10 to 65 years with the peak incidence between 11-30 years comprised of 55 patients (67%) of the total study group. Seventy five of 82 patients underwent surgical management. Modified Young's procedure was done in 40 patients; followed by Young's operation in 25 cases, septal and sinus surgeries in 10 cases and 7 patients were treated conservatively by nasal douching. Complications were not significant in Young's or modified Young's operation except vestibular stenosis (6%), wound dehiscence (5%) which required corrective surgery for the same.

Conclusion: Treatment of atrophic rhinitis often involves multiple modalities. Surgical management (modified Young's and Young's) gave very good results with minimal complications.

Keywords: Atrophic rhinitis; Nasal douching; Young's surgery; Modified young's surgery

Introduction

Atrophic Rhinitis (AR) is a chronic nasal disease which is characterized by progressive atrophy of the nasal mucosa and underlying bone of the turbinates and the presence of a viscid secretion which emits a characteristic foul odour sometimes called ozaena (a stench). There is an abnormal patency of the nasal passages. It was known to the ancient Greek, Indians and Egyptian civilizations. Now a days because of the improved socioeconomic conditions, its incidence in western countries has declined whereas in Asia, Africa, Eastern Europe, Egypt, Greece, Hungary, Yugoslavia, India, Malaysia and Philippines [1,2] it is still a major problem. The incidence varies from 0.3-7.8% of otolaryngology outpatients. The causative agent for primary AR is *Klebsiellaozaena* in many cases. Even with maximal medical management, patients will continue to have crusting, and may relapse to frank ozaena if maintenance therapy is suspended. In attempts to avert the need for lifelong therapy, numerous surgical therapies have been attempted.

The disease is quite common in South India and the surgically managed patients had very good result at the end of one year which prompted us to study all the cases of atrophic rhinitis that were presented to our hospital for the last three years.

Materials and Methods

It was a prospective study of 82 patients who were treated for atrophic rhinitis in a tertiary care hospital at coastal Karnataka of South India for the last 3 years were carried out. Detailed history of the patient including their family history, clinical findings, investigations like haemogram, X-ray of the sinuses and nasal swab culture reports were obtained. Details of treatment either the medical management (those denied surgery) or the surgical procedures and any associated complications thereafter are also noted. The symptomatic and clinical improvement of the patients at 3 months, 6 months and at 1 year of follow up was noted.

Results and Observations

Total of 82 patients with atrophic rhinitis were studied with age ranged from 10 to 65 years with female preponderance (54%). The peak incidence is between 11-30 years comprised of 55 patients (67%) of the total study group. Bilateral atrophic rhinitis is seen in 96% of the patients. Family history was positive in 4 families. These patients presented with symptoms of fetor (84%); nasal discharge (77%); nasal obstruction (63%); anosmia (39%); headache (30%); and epistaxis (24%). On clinical examination 84% of them had greenish crusts filling the entire nasal cavities on both sides and 12% also had deviated nasal septum with para-nasal sinus tenderness. Few of the patients had maggots inside the nose. Culture of the nasal swab showed *Klebsiellaozaena* in 56% followed by *P. areugenosa* 16%, *Strep. Pneumonia* 8%, *Proteus* 4%, mixed growth in 10% and no growth in 6%. X-ray of the paranasal sinuses was taken those who had para nasal

sinus tenderness on clinical examination which showed haziness of the maxillary antrum. Few of them had thickened sinus walls and small maxillary antrum. Seventy five of 82 patients underwent surgical management. Modified Young's procedure was done in 40 patients; followed by Young's operation in 25 cases, septal and middle meatalantrostomy surgeries in 10 cases those who had maxillary haziness on X-ray. Seven patients were treated conservatively by nasal douching as shown in Table 1.

Management	No. of patients
Modified Young's operation	40
Young's operation	25
Septal & Sinus surgery	10
Conservative treatment	7

Table 1: Management options.

Wound dehiscence occurred in 4 patients and few of the patients complained of nasal obstruction in the immediate post-operative period. All the patients had regular follow ups, 61% had shown partial symptomatic improvement and 32% had complete improvement at the end of 3 months. At 6 months, 83% of them showed complete improvement and at the end of 1 year all the patients managed surgically were free of nasal discharge and fetor compared to conservative management as they had intermittent above symptoms which is shown in Table 2.

Duration of closure	Symptomatic improvement			
	Partial	%	Complete	%
3 Months	50	61%	32	39%
6 Months	14	17%	68	83%
1 Year	00	00%	82	100%

Table 2: Symptomatic improvement.

Discussion

Atrophic rhinitis is a disease known since biblical times. It is characterized by progressive atrophy of the nasal mucosa and offensive smell (ozaena). In modern society, this is often a diagnosis of exclusion. Once the diagnosis of atrophic rhinitis is made, an etiology should be sought. The causes are generally separated into two categories: Primary and Secondary. Primary AR is the classic form of the disease, and is felt to arise de novo. Causative agent for primary AR is *Klebsiellaozaena* in many cases. Other factors like heredity, endocrinal disturbance, nutritional deficiency, or autoimmune process also attributing to it. Secondary atrophic rhinitis can be due to syphilis, lupus, leprosy, rhinoscleroma, long standing purulent sinusitis, excessive surgical removal of turbinates or grossly deviated nasal septum.

AR is usually seen between the age group of first decade to sixth decade of life and is common in females. In our study patients ranged from 10 to 65 years and peak incidence was between 11 to 30 years with female preponderance. Austin Young [3] whose patients ranged from 8 to 59 years with peak incidence between 10 to 15 years and Males to female ratio was 1:9. Primary AR is bilateral and unilateral

cases are uncommon. Our study had 96% of bilateral AR and only 4% of cases were unilateral AR. Similar study done by Austin Young found 18% of his cases were unilateral and study done by Sinha et al. [4] had 8.5% unilateral cases.

Austin Young [3] mentioned in his work a case of a daughter inheriting the condition from her mother. Girgis [5] quotes identical female twins and separately, another mother and daughter with primary AR. Barton et al. [6] in his study of large Irish family for three generations found a father and eight children in second generation and two children in the third generation having AR. They proposed this disease to be dominant in inheritance. The above work suggests an autosomal dominant mode of inheritance but the same cannot be said in our series. We observed AR in 4 families. In one family the mother, son and daughter were affected. In another family a brother and sister were affected. In the third family 4 brothers while in the fourth family 2 sisters were affected.

Generally AR patient's presents with symptoms of fetor, nasal obstruction, nasal discharge, epistaxis, anosmia which accompanies these degenerative changes. The findings of AR are easily recognizable. The first sign often is the smell of the patient. This likely will cause distress to everyone except the patient, due to the prevalent finding of anosmia. Some patients have also been noted to have clinical depression at presentation due to the social implications of the disease. Another prominent finding is nasal crusting filling the entire nasal cavity. Removal of these crusts may induce bleeding. Once the crusts have been removed, several other features may be noted. The mucosa is generally atrophic, with elements of squamous metaplasia present. The volume of the nasal cavity may appear large, either due to absence of turbinate tissue, or lateralization of the lateral nasal walls. Purulent discharge and septal perforations are not uncommon.

Our patients presented with symptoms of fetor (84%); nasal discharge (77%); nasal obstruction (63%); anosmia (39%); headache (30%); and epistaxis (24%). On clinical examination 84% of them had greenish crusts filling the entire nasal cavities on both sides and 12% also had deviated nasal septum and para-nasal sinus tenderness. Few of them had maggots inside the nose. On the contrary, study by Kameswaran et al. [7] showed out of the 42 patients, anosmia (100%), nasal discharge (95%) were the commonest symptoms followed by epistaxis and septal perforation, columellar necrosis were also reported along with above findings. One of the interesting finding in our study was the presence of maggots in 7 patients, which depicts the poor local hygiene as a result of loss of sensation of that area.

Various organisms have been cultured from cases of atrophic rhinitis such as *Klebsiellaozaena* (*Perez bacillus*), *Diphtheroids*, *P. vulgaris*, *Esch. coli*, *Staphylococci* and *Streptococci* but they are all considered to be secondary invaders responsible for foul smell rather than the primary causative organisms of the disease. In our study of the 82 patients culture reports were showed *Klebsiellaozaena* in 56% followed by *P. areugenosa* 16%, *Strep. pneumonia* 8%, *Proteus* 4%, mixed growth in 10% and no growth in 6%.

The overall therapy encompasses two main goals: restoration of nasal hydration, and minimization of crusting and debris. To achieve these goals, several broad classes of therapies may be used: topical or local, systemic, or surgical. One of the most widely used treatments is nasal irrigation. This can be used with curative intent or as maintenance therapy. Irrigations are used to prevent the formation of the hallmark extensive crusting. To achieve this result, irrigations most often be done multiple times in a day. As a result, patient compliance

is often difficult. The type of irrigation used varies by author, and numerous solutions have been suggested. Some authors advocate saline douching [1] while others recommend a mixed solution of sodium chloride, sodium bicarbonate and sodium borbate [7] in addition, painting with 25% glucose in glycerine solution or a bland ointment may keep the saprophytic infection down.

Systemic or oral therapies are often used in conjunction with the nasal irrigation. The most common type of systemic therapy is antibiotics. Just as the curative irrigations, these are only given to resolve the purulent discharge and foul odour, and then are discontinued in favour of maintenance irrigation therapy.

In almost all cases, even with maximal medical management, patients will continue to have crusting, and may relapse to frank ozena if maintenance therapy is suspended. In attempts to avert the need for lifelong therapy, numerous surgical therapies have been attempted.

The Young's operation or its modified version is the most popular surgical technique employed in the treatment of atrophic rhinitis. This operation which closes the nostrils helps in regeneration of normal nasal mucosa [8] along with appearance of mucous strands [7] though the mucosa is dark and swollen in early stages; it becomes pink in a few weeks [8]. Moreover, as soon as nostril is closed, the offensive features of the disease like fetor and crusting disappears [3,4].

Numerous other therapies have been suggested in recent literature [9-13]. A method for non-surgical nasal closure that may provide similar results involves the creation of a nasal obturator [14]. This is performed using standard ear mould techniques. The obturator is then cast using clear silicon. These can be worn with minimal cosmetic effects, while providing easy access for examination and routine cleaning.

In our study we had 75 patients for whom Young's operation or modified young's was done together with a reasonable follow up. At the end of 1 year, complete symptomatic improvement was seen in all the patients with absence of fetor, crusting and nasal discharge. On clinical examination about 10% of the patients did not show complete resolution of the crusting in whom modified Young's operation was done. The reason for this could be that the size of modified procedure opening is large and permits considerable amount of air to reach the nasal cavity. Young [3] himself has suggested that partial opening of nasal cavity is of no benefit and the operation is tolerated better in elderly than expected. Lautenschlager was the first surgeon to embark on a definitive surgical procedure for AR. He reduced the size of the roomy cavities to bring in some normalcy to the nasal air flow by medializing the lateral nasal wall or the medial wall of the maxillary antrum using a Caldwell-Luc type of approach. Reducing the size of the roomy cavities has seen several modifications and led to the use of various substances and implants that are endonasally or sublabially inserted into the floor, septum or lateral walls of the nose. The list includes autologous bone (cortical or cancellous chips), cartilage, fat, muscle; homologous lyophilized bone, cartilage, fat, placenta; synthetics such as glass beads, acrylics, plastic gauzes, Teflon, Proplast, Dacron, silicone or silastic grafts, glycerine, paraffin or dental pastes, and so on [9-11,15]. Sinha et al. modified the technique leaving a small 3 mm-diameter hole within the skin membrane. Any further increase in size of the hole decreased the success rate rapidly. As such, this procedure may be carried out on both nostrils simultaneously [15]. It

is useful to visualize periodically with the nasal endoscope (Hopkins rod-lens telescope or fiberoptic scope) the nasal cavities of patients who have undergone Young and modified Young operations. Diagnostic endoscopy would demonstrate reduction of crusts following surgery, reappearance of free mucus suggesting respiratory mucosal regrowth and hence the need to plan for reversal of the procedure. Wittmaack's operation this procedure increases nasal secretion and lubrication by implantation of a Stensen's (parotid) duct into the maxillary antrum. Stellate ganglion injections are also tried [15]. Hyaluronic acid gel also been used to treat AR [16,17].

Conclusion

Atrophic rhinitis is an uncommon disorder in many parts of the world. Current understanding suggests that this is a single condition which may arise either primarily from yet unconfirmed factors, or results secondarily from insult to the nasal cavities. The treatment of this condition often involves multiple treatment modalities; and can be local, systemic or surgical.

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