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Retrospective study of the treatment of atrophic rhinitis and its application in the present study

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ABSTRACT:

Background: 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 odor sometimes called ozaena (a stench). There is an abnormal patency of the nasal passages.

Objectives: The aim of this study was to compare the effects of conservative method and surgical method of treatment in Atrophic rhinitis i.e. implantation of placental graft underneath the muco-periosteum of nasal floor.

Material and methods: It was a prospective study of 50 patients who were treated for atrophic rhinitis; the patients were decided to treat patients randomly by conservative method and by surgical method. All cases were studied after detailed investigations.

Observation and results: The effects of treatment were studied by clinical, radiological, and histopathological observations as well as by subjective and objective improvement of patient. The follow up patient was carried out at the interval of one month, 6 months and 1 year; after initial treatment. The results of treatment were categorized as good or poor.

Conclusion: It is concluded that submucosal placental grafting is the treatment of choice in primary atrophic rhinitis. The method is the most effective, easy to undertake, without any antigenic reactions and major complications. It employs the cheapest and most nutritive material for grafting.

Keywords: Atrophic Rhinitis, Ozaena, Placental grafting, Nasal myiasis, Maggots, Rhinoscopy.

Introduction

Atrophic rhinitis is a chronic nasal disease characterized by progressive atrophy of the nasal mucosa and underlying bone of the turbinates and very roomy nasal cavity, the formation of foul smelling thick black or greenish crust, to which attributed the term ozaena.1 The earliest complaint is a feeling of dryness in the nose and headache commonly described as an aching behind the eyes. Nasal myiasis occurs most commonly in Asia and less commonly in Africa. Nasal myiasis, which is not uncommon in hot and humid climate particularly in India, is also known as *Peenash.* It is a demoralizing condition of infestation of the nasal cavities by maggots, the larvae of fly (Diptera).[1,2,15]

Chronic atrophic rhinitis may be primary and secondary. Special forms of chronic atrophic rhinitis are rhinitis sicca anterior and ozaena. It was known to the ancient Greek, Indians and

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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.[1,2,4,13] 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 two years i.e. between 1998-2000.

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 patient complains of a diffuse swelling around the nose and eyes, nasal obstruction, epistaxis or the presence of maggots coming out of nose. Rhinoscopy reveals a congested edematous mucosa, necrotic material with embedded maggots, ulcerated mucosa or septal perforations. The disease can spread to the paranasal sinuses and via the nasolacrimal duct to lacrimal sac.[21]

Atrophic rhinitis is a disease characterized by offensive odor from the nose, crusting, nasal blocking, widening of nasal passages and atrophy of turbine bones. The stench given out by the patient, makes his life miserable as people avoids his company. As the treatment is not always rewarding, it leads him from one doctor to another, trying out all sorts of remedies to make him get rid of the awful stench. In 1876 Frankel described a triad of symptoms- fetor, atrophy of internasal structures and crusting. The true etiology of the disease has not been established. Various theories have been put forward.[4,13] Atrophic rhinitis does not present a pathognomic picture histologically; there is no cure for Atrophic rhinitis. Good palliation of symptoms may be obtained by medical measure alone, surgery being reserved for those patients who do not respond adequate medical treatment. The fact that various surgical procedures have been attempted for this condition denotes a lack of satisfactory operation for this disorder.[14]

In the present study we decided to treat patients randomly by conservative method and by surgical method. All cases were studied after detailed investigations. The effects of treatment were studied by clinical, radiological, and histopathological observations also by subjective and objective improvement of patient. The follow up patient was carried out at the interval of one month, 6 months and 1 year; after initial treatment. The results of treatment were categorized as good or poor. The aim of this study was to compare the effects of conservative method and surgical method of treatment in Atrophic rhinitis i.e. implantation of placental graft underneath the muco-periosteum of nasal floor.

Treatment of atrophic rhinitis can be either medical or surgical.

Medical measures include[4,17]

- Nasal irrigation using normal saline.[3]
- Nasal irrigation and removal of crusts using alkaline nasal solutions prepared by dissolving a spoonful of powder containing one part sodium bicarbonate, one part sodium biborate and two part sodium chloride.
- 25% glucose in glycerin can be applied to the nasal mucosa to inhibit the growth of proteolytic organisms which produce foul smell.
- Local antibiotics, such as chloromycetine
- Vitamin D_2 (Kemicetine).
- Estradiol spray for regeneration of seromucinous glands and vascularization of mucosa.
- Systemic streptomycin (1g/day) against Klebsiella organisms.
- Oral potassium iodide for liquefaction of secretion.
- Placental extract injected in the submucosa.

Surgical interventions include[3,6]

Young's operation,[8-11]

The techniques described by Girgis without any modification, but in two cases, we approached the floor of nasal cavity by incision in nasal vestibule instead of sublabial approach. In the approach via nasal vestibule, bleeding and time for surgery was reduced, because dermofat grafting involves a major operation under general anesthesia with a hospital stay. The immediate postoperative period was quiet stormy in all the eight cases in which sublabial approach was followed, they had swelling of face and pyrexia, While in nasal vestibule approach, swelling of face was minimum.

Modified Young's operation[11]

Young's operation was done with a slight modification by placing the incision little more anteriorly and converting the technique in double layer closure, i.e. modified Young's operation. The added advantages were safety avoidance of separate wound and the patient's satisfaction of breathing through the nose, and one can perform anterior rhinoscopy with infant-sized ear speculum through the hole. Bilateral operation could also be performed in the same sitting without posing many problems postoperatively and the problems of reopening can be avoided.

MATERIALS AND METHODS

It was a prospective study of 50 patients who were treated for atrophic rhinitis in the outpatient Department Of Otolaryngology, Rajiv Gandhi Medical College and Chhatrapati Shivaji Maharaj Hospital, Thane, Maharashtra, India. The study was performed in one year period from January 1998 to January 2000.

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.

Detailed local examination was done. Any external deformity of nose in the form of depression of bridge was noted, presence or absence of pallor of mucosa and dryness, presence of any maggots, posterior Rhinoscopy was done to note down any post nasal discharge or bleeding. Any sinus tenderness was also noted for any evidence of sinusitis.

Examination of throat and larynx was carried out in every patient to find out any atrophic changes. Ear examination was done to rule out otitis media. All clinical photographs, pathological and radiological investigations were performed.

25 patients were put under medical line of treatment. Injection streptopenicillin 1gm: 4 lacks i.m. was given after doing skin sensitivity test, once a day. Daily nasal douche was given with alkaline solution containing sodium chloride (10%) and sodium bicarbonate (10%) in the outpatient department. Patient was advised to instill liquid paraffin drops or pure ghee in nose four times a day. The patients with maggots were given manual nasal wash containing a mixture of ether and saline.

25 patients were selected for surgical line of placental grafting i.e. submucosal implantation placental bits of nasal floor.

In children, procedure did under general anaesthesia for adult's procedure done under local anaesthesia. Freshly collected placenta was collected and stored in isotonic saline.

After collection of placenta (25-30gm), it was thoroughly washed with isotonic saline and all clots were removed.

Denker's method: 1% lidocaine HCL with 1:100,000 Epinephrine was injected into the anticipated incision sites along the nasal floor, lateral nasal wall, and anterior to the head of the inferior turbinate. A needle tip was used to incise the mucosa inferiorly at the junction of the nasal floor and lateral nasal wall, carrying the incision through the periosteum. A second mucosal incision was then made superiorly along the lateral nasal wall and carried anteroinferiorly to lie just in front of the anterior head of the inferior turbinate overlying the edge of the pyriform aperture. this, a sub periosteal dissection was performed with a suction Freer elevator to expose

the anterior aspect of the maxilla, the infraorbital foramen, and its neurovascular bundle as well as the lateral nasal wall. The pocket was filled temporarily with a wet gauze piece and after some time with bits of placental tissues. The same procedure was repeated on the opposite side.

During the follow up patient was asked about the symptoms and relief of symptoms, if any. Anterior Rhinoscopy was done to note crusts, discharge, bleeding. All cases a nasal mucosa biopsy was taken for histopathology examination at the end of 6 months.

The patients with maggots were advised operation after three months. The patient with pulmonary tuberculosis was kept under anti tubercular therapy.

RESULTS:

The study was carried out on 50 patients who were treated for atrophic rhinitis in the outpatient Department Of Otolaryngology, Rajiv Gandhi Medical College and Chhatrapati Shivaji Maharaj Hospital, from June 1998 to June 2000, grouped into two groups of 25 patients.

First group was treated by operative with placental grafting and second group was treated by medical line of treatment.

Table 1: Age-wise distribution of patients

Age group	No. of patients	Percentage
11-20	8	16
21-30	21	42
31-40	11	22
41-50	5	10
51-60	5	10
Total	50	100

Maximum incidence of atrophic rhinitis was noticed in 21-40 years i.e. 64% (Table 2)

Table 2: table showing gender incidence.

Gender	No. of patients	Percentage
Male	18	36
Female	32	64
Total	50	100

As showed by Table 3, the disease was commonly observed in female patients.

Table 3: table showing symptomatology of patients.

Symptoms	No. of patients	Percentage
Nasal crusting	35	70
Epistaxis	28	56
Nasal obstruction	18	36
Anosmia	10	20
Fetor	21	42
Headache	13	26
Maggots	10	20

Nasal crusting: most common
Epistaxis: severe in patients having maggots.
Maggots: more in females than males.
All patients were anemic and malnourished

Table 4: table showing clinical signs of patients.

Clinical signs	No. of patients	Percentage
Excessive crust deposition	35	70
Roomy nasal cavities	30	60
Atrophic turbinates	30	60
Post nasal discharge	10	20
Deflected septum	3	6
Maggots	10	20
Depressed nasal bridge	6	12

Although 3 patients had deflected septum, it was not the cause of atrophic rhinitis. All the 10 patients with maggots with atrophic rhinitis had facial cellulitis involving nose, upper lip, cheeks and eyelids. In some cases maggots were crawling outside and with post nasal bleeding.
Systemic examination: 2 patients had signs of respiratory diseases. One female patient had pneumonitis of right middle lobe. She had decreased air entry and fine crepitations, on that side. Another female child of 12 years had

bilateral pneumonitis. X- Ray chest confirmed the diagnosis in these cases. These findings were detected during the routine investigation and not be related to atrophic rhinitis.
Urine examination and VDRL test was negative. X-ray paranasal sinuses showed widening of nasal cavities and haziness of maxillary sinuses was observed in all patients. Hypopneumatization of para nasal sinuses was seen in 10 patients.
Nasal swab culture was positive in 40 patients.

Table 5: showing organisms involved in the disease

Type of organism	No. of patients	Percentage
Staph. Aureus	30	60
kl. Ozenae	20	40
Escherichia coli	20	40
Proteus	10	20
Pseudomonas	5	10

After treatment nasal swabs were cultured at the interval of 1, 6 and 12 months.

Table 6: follow-up for organism culture.

Duration in months	Organism	No. of patients
1	Staph. Aureus	10
	Escherichia coli	5
6	Staph. Aureus	20
	Kl. Ozenae	10
	Proteus	5
12	Staph. Aureus	25
	Proteus	10
	Pseudomonas	5

Histopathological studies showed squamous metaplasia with or without keratinization, denudation of epithelium at places; dense fibrosis in the tunica propria; mucous glands were decreased in number; capillaries were either obliterated due to endarteritis or dilated due to periarteritis; underneath stroma showed chronic inflammatory cell exudate consisting of lymphocytes and plasma cells.

After one year, decreased inflammation seen, the state of epithelium, mucus glands and capillaries did not reverse too normally in some patients.

Table 7: results of treatment.

Type of treatment	Relief	No relief	Total
Medical	5	20	25
Surgical	20	5	25
Total	25	25	50

Good results were obtained in 80% by surgical method.

DISCUSSION

Atrophic rhinitis is a disease known since biblical times. It is characterized by progressive atrophy of the nasal mucosa and offensive smell (ozaena).[1,2] 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 arisede 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, and rhinoscleroma, long standing purulent sinusitis, excessive surgical removal of turbinates or grossly deviated nasal septum.[1,2,4,13]

With continued advances in endoscopic techniques, recent years have witnessed significant innovation in surgical approaches to sinonasal and skull base pathology. A substantial number of open surgeries have been supplanted by endonasal procedures, and the spectrum of applications for such less-invasive methods has expanded considerably to encompass progressively larger, more complex lesions. This paradigm shift has been clearly demonstrated in surgical approaches to the maxillary sinus, where open medial maxillectomy via transfacial/ sublabial incisions has given way to a potpourri of novel endoscopic surgeries and transseptal techniques.[1,7]

In our study, in Maximum incidence of atrophic rhinitis was noticed in 21-40 years i.e. 64%; while Karnik reported 85% cases in the group 10-

30 years and Yadav reported 52.5% cases in the group of 21-40 years.[22,23]

In our study, female predilection was 64%, while Karnik 60%,[23] Yadav showed 56%.[22]

In our study, patients were having symptoms like excessive crust deposition, roomy nasal cavities, atrophic turbinates, post nasal discharge, deflected septum, maggots, depressed nasal bridge; which is similar to the studies by S. G. Gupta (1977).[24]

In our study, patients presented with diffuse swelling around the nose and eyes, nasal obstruction, epistaxis, presence of maggots coming out of the nose; Rhinoscopy revealed congested edematous mucosa, necrotic material with embedded maggots, ulcerated mucosa or septal perforations.

In our study, showed iron deficiency anaemia and chronic infection in all cases. This fact supports the deficiency theory of atrophic rhinitis. X- Ray studies revealed widening of nasal cavities, haziness of sinuses and Hypopneumatization have also been observed. These findings show chronic sinus infection. The definite diminution in the size of paranasal sinuses is due to arrest of development as the disease starts at young age. The mucous membrane lining the sinuses has been shown to undergo atrophic changes, but no scales ammulates on its surface.

In our study, medical therapy had 20% relief; Yadav reported 35% relief rate.[22]

The entomological aspects of myiasis are well described by Sood, Kakar, Wathal (1976).[25] Our study presented with diffuse swelling around the nose and eyes, nasal obstruction, epistaxis or the presence of maggots coming out of the nose; Rhinoscopy revealed congested edematous mucosa, or septal, necrotic material with embedded maggots, ulcerated mucosa or septal perforations.

Treatment is general, with antibiotics and supportive therapy. In case of myiasis the local treatment is most important. Our patients were given frequent nasal douches with other in combination with cold isotonic saline to paralyses larvae or removed with forceps.

Radiologically there was no maxillary sinus infection; nasal swab culture was either sterile or has grown staph. Cocci and nasal mucosa histopathology revealed decrease in inflammatory reaction. I the rest five patients treated by surgical methods, there was no postoperative improvement.

In rest of the 32 cases, Young's operation was done with a slight modification by placing the incision little more anteriorly and converting the technique in double layer closure, i.e. modified Young's operation. The added advantages were safety avoidance of separate wound and the patient's satisfaction of breathing through the nose, and one can perform anterior Rhinoscopy with infant-sized ear speculum through the hole. Bilateral operation could also be performed in the same sitting without posing many problems postoperatively and the problems of reopening can be avoided. The operation appears technically a simple one. One does not have to look out for external source or an additional operation for materials for implantation. Most of the cases, it can be performed under local anesthesia with good sedation in adequate doses. Patient experiences mild pain and swelling of the nose for 2 to 3 days. No serious postoperative complications were observed by us. The crusting disappears and the mucosa turns pink very quickly after the closure. Perhaps nostril closure stands as an ideal operation for those unfortunate patients who come with history of maggots and mutilation of turbinates and nasal tissue by maggots with septal perforation. They do better with partial nostril closure while patients not having history of maggots and septal perforations had best result with dermofat graft operation. In all of the above-mentioned patients, there was great improvement in nasal mucociliary flow rate after surgery for atrophic rhinitis and all of them were relieved from their symptoms.[3,8-11]

Partial nostril closure was done in cases of septal perforation. It is not possible to do another implant operation like dermofat graft in these cases properly. In this series, four patients who

came with septal perforation with maggot's infestation were subjected to partial nostril closure. All are showing good results inspite of septal perforation. Hence, partial nostril closure stands unique as an ideal operation where septal perforation is present. The partial nostril closure does not pose any problem and is hardly noticeable.[3,5]

In immediate postoperative days, the complaints of dryness of mouth especially after a night's sleep by a few patients were reported. It was due to mouth breathing and is relieved by drinking water. They were also not found more prone to suffer from upper respiratory tract infection. But surely, they are disabled to some extent by the nasal tone of speech.

CONCLUSION

It is concluded that submucosal placental grafting is the treatment of choice in primary atrophic rhinitis. The method is the most effective, easy to undertake, without any antigenic reactions and major complications. It employs the cheapest and most nutritive material for grafting.

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