RESULTS

RESULTS

30 patients clinically suffering from primary atrophic rhinitis were included in this study.

Age incidence:

The ages of the patients included in this study were found to range from 13 up to 37 years and is shown in table I.

Table I: Age incidence

Age incidence	Number of cases	%
10 - 20 years	15	50
20 - 30 years	9	30
Above 30 years	6	20

Duration of affection:

The duration of affection of the examined patients was averaged from less than one year to more than three years.

Table II: Duration of affection.

Duration of affection	Number of patients	%
Less than one year.	6	20.0
From one to three years.	8	26.6
More than three years.	16	53.4

20% of patients started to complain of symptoms for less than one year, 26.6% of them for more than one year but less than three years and 53.4% for more than three years.

Sex incidence:

The sex incidence of patients is shown in Table III.

Table III: Sex incidence.

Total	Number of females	%	Number of males	%
30	23	77	7	23

Ratio of females to males affection in our study was 3.3:1.

Family incidence:

Family history was positive for similar condition in only 9 patients of the all 30 examined patients (30%).

Results of histopathological study:

On examination of our 30 patients, we have found that atrophic rhinitis affecting nasal mucosa can be classified histopathologically into three grades according to the duration of affection.

I- First grade: (Fig.1 nose, 2 sinus)

This group of patients was suffering from clinical manifestations of atrophic rhinitis for less than one year.

There was a mild affection of nasal mucosa. Histopathologically, the nasal mucosa showed the following characteristics:

Epithelium:

Pseudo-stratified columnar epithelium, lost its ciliary apparatus. But there was no squmous metaplasia. There was decrease of goblet cells.

Lamina propria:

It was infiltrated by inflammatory cells mainly lymphocytes and plasma cells specially around blood vessels and glands. Also there was early fibrosis.

Glands:

The mucous secreting glands were found to be diminushed in number and the acini became smaller than normal mucosa.

In the group of the first grade patients, the maxillary sinus mucosa showed the following characteristics:

Epithelium:

Pseudo-stratified columnar ciliated epithelium, there was no squmous metaplasia. There was no decrease of goblet cells.

Lamina propria:

Dens fibroelastic tissue, there was no atrophic changes, no inflammatory cells. There was no fibrosis.

Glands:

There was no change in serous and mucous glands.

II- Second grade: (Fig.3. nose, 4 sinus , 5 eosinophilic infilteration)

This group of patients was suffering from clinical manifestations of atrophic rhinitis for more than one year but less than three years.

There was a moderate affection of the nasal mucosa. Histopathologically, the nasal mucosa showed the following characteristics:

Epithelium:

Pseudo-stratified columnar epithelium lost its cilia, there was patchy stratified squmous metaplasia and marked decrease of goblet cells, but there was no keratinization.

Lamina propria:

There was more infiltration of infilammatory cells mainly eosinophilic cells also there was lymphocytes and plasma cells. There was dense fibrosis. There was no blood vessels dilatation.

Glands:

There was a marked decrease in number of the mucous secreting glands, the acini became smaller.

In this group of patients, the maxillary sinus mucosa showed the following characteristics.

Epithelium:

Pseudo-stratified columnar ciliated epithelium. There was no squmous metaplasia, but there was increase in number of goblet cells.

Lamina propria:

There was no atrophic changes, no inflammatory cells. There was no fibrosis.

Glands:

There was hyperplasia and increasing in number of mucous glands.

III- Third grade: (Fig.6 nose, 7 sinus)

This group of patients was suffering from clinical manifestations of atrophic rhinitis for more than three years.

There was marked affection of the nasal mucosa. Histopathologically, the nasal mucosa showed the following characteristics:

Epithelium:

There was complete replacement of pseudo-stratified columnar ciliated epithelium by stratified squmous epithelium.

The cytoplasm of squmous cells were filled with granules, and nuclei were round and centrally placed. On top of squmous epithelium a layer of keratin was present.

Lamina propria:

There was complete atrophy of lamina propria with diffuse fibrosis and infiltration by numerous cellular elements mostly lymphocytic infiltration with some eosinophiles and plasma cells specially around blood vessels which showed dilatation.

Glands:

There was complete disappearance of glands.

In this group of patients, the maxillary sinus mucosa showed the same characteristics of nasal mucosa.

Table IV: Correlation between the pathological grade and the duration of affection.

Case No.	The pathological grade	The duration of affection
1	1st grade	8 months
2	1st grade	7 months
3	2nd grade	30 months
4	2nd grade	24 months
5	3rd grade	4 years
6	1st grade	10 months
7	3rd grade	5 years
8	3rd grade	5 years
9	3rd grade	4 years
10	3rd grade	4 years
11	3rd grade	6 years
12	3rd grade	3.5years
13	3rd grade	6 years
14	2nd grade	21 months
15	1st grade	8 months
16	3rd grade	4 years
17	3rd grade	4 years
18	3rd grade	5 years

Table IV: Correlation between the pathological grade and the duration of affection. (Cont.)

Case No.	The pathological grade	The duration of affection
19	2nd grade	20 months
20	3rd grade	6 years
21	2nd grade	15 months
22	2nd grade	24 months
23	3rd grade	5 years
24	1st grade	10 months
25	2nd grade	16 months
26	3rd grade	4 years
27	1st grade	9 months
28	2nd grade	20 months
29	3rd grade	5 years
30	3rd grade	7 years

Table V: Results of histopathological examination.

Grade of affection	Surface epithelium					
	Type		Cilia		Goblet cells	
	Nose	Sinus	Nose	Sinus	Nose	Sinus
First grade	Columnar	Columnar ciliated	Lost	Present	Decrease	No decrease
Second grade	Patchy stratified squmous epithelium	Columnar ciliated	Lost	Present	Severe decrease	Increase
Third grade	Stratified squmous epithelium	Stratified squmous epithelium	Lost	Lost	Lost	Lost

Table V: (Cont.) Results of histopathological examination.

Grade of affection	Lamina propria				Glands	
	Inflammatory cells		Fibrosis			
	Nose	Sinus	Nose	Sinus	Nose	Sinus
First grade	Present	Absent	Early fibrosis	No fibrosis	Decrease in number	No decrease in number
Second grade	More inflammatory cells	Absent	Dense fibrosis	No fibrosis	Severe decrease in number	Hyperplasia & increase in number
Third grade	Diffuse	Diffuse	Diffuse fibrosis	Diffuse fibrosis	Complete disappear-ance	Complete disappear-ance

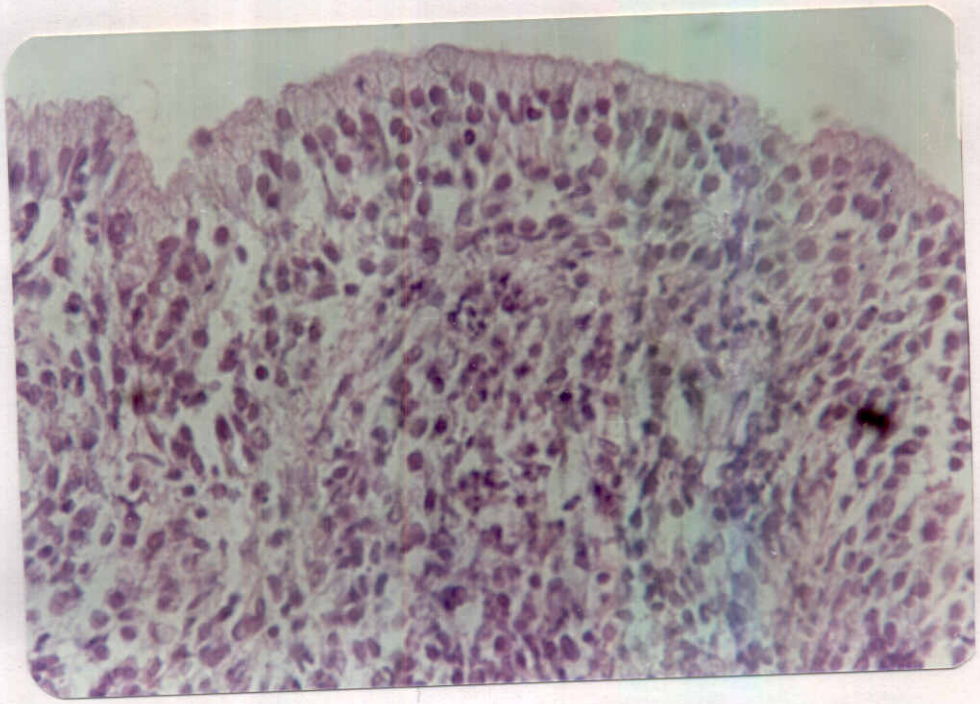

Fig.1: Atrophic rhinitis grade I, nose.

Pseudo - stratified columnar epithelium with decrease in number of goblet cells, inflammatory cellular infiltration and decrease of mucous glands in number and size also are shown.

(H & E x 125).

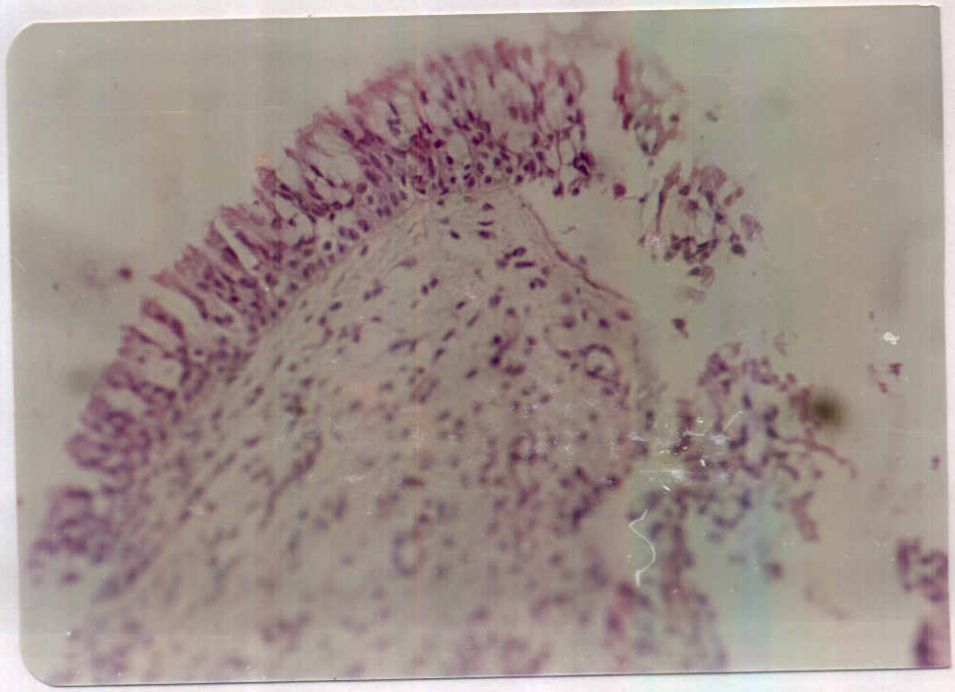

Fig. 2: Atrophic rhinitis grade I, sinus.

Pseudo - stratified columnar ciliated epithelium.

(H & E x 125).

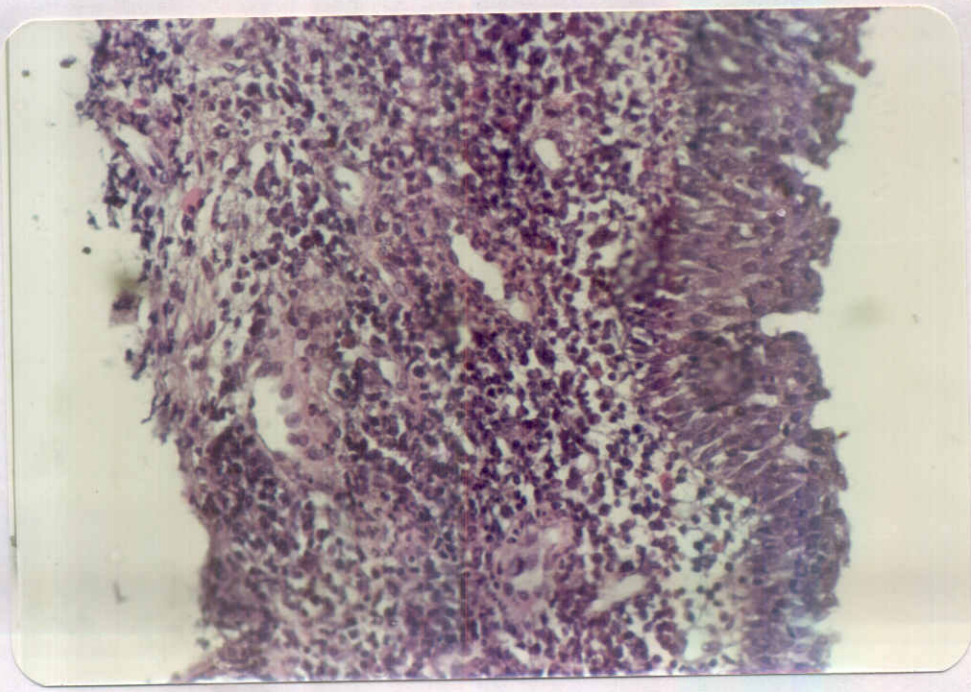

Fig.3: Atrophic rhinitis grade II, nose.

Pseudo - stratified columnar epithelium with patchy stratified squmous metaplasia, marked decrease in number of goblet cells, more inflammatory cellular infiltration mainly eosinophilic cells and marked decrease in number of mucous glands.

(H & E x 125)

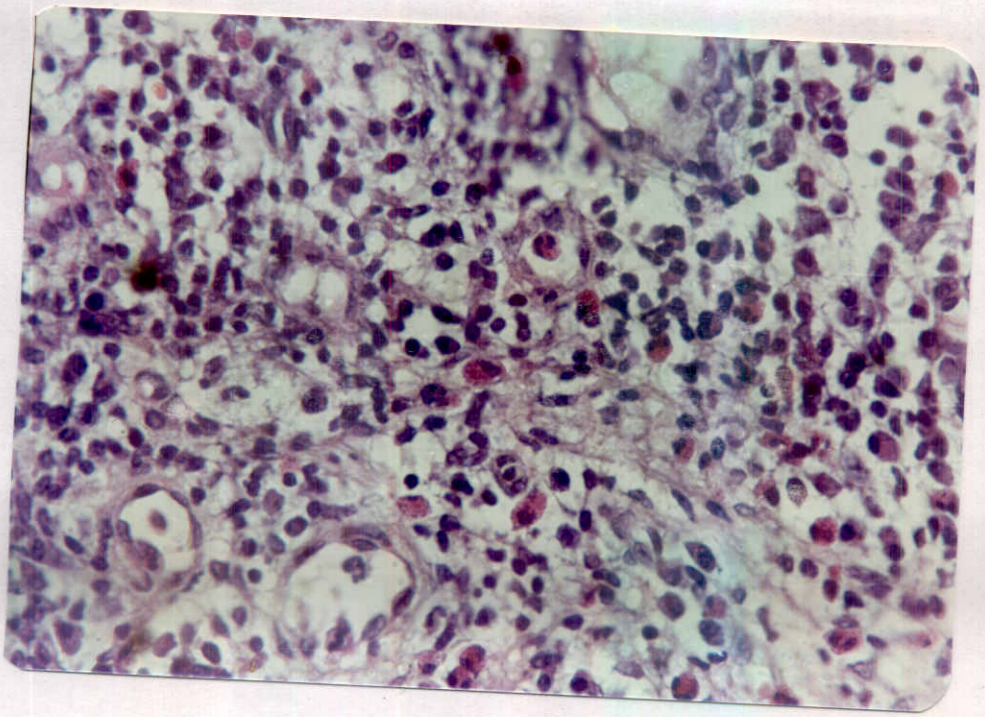

Fig.5: Atrophic rhinitis grade II, nose.
Eosinophilic infiltration.
(H & E x 400).

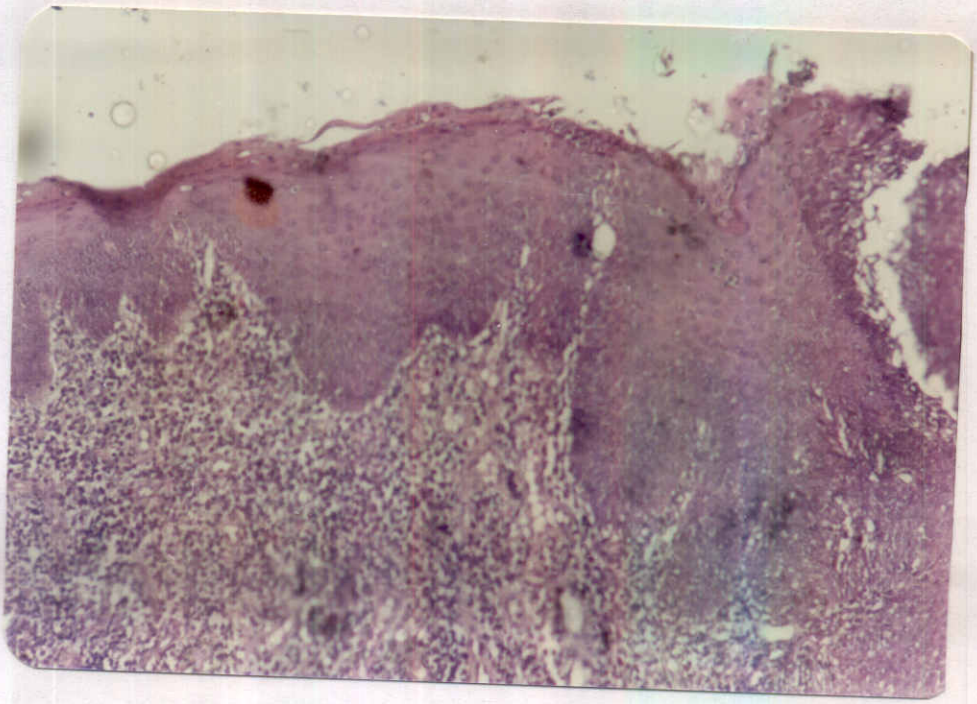

Fig.6: Atrophic rhinitis grade III, nose.

Stratified squmous epithelium with keratinization, atrophy of lamina propria with fibrosis and atrophy of mucous glands.

(H & E x 125

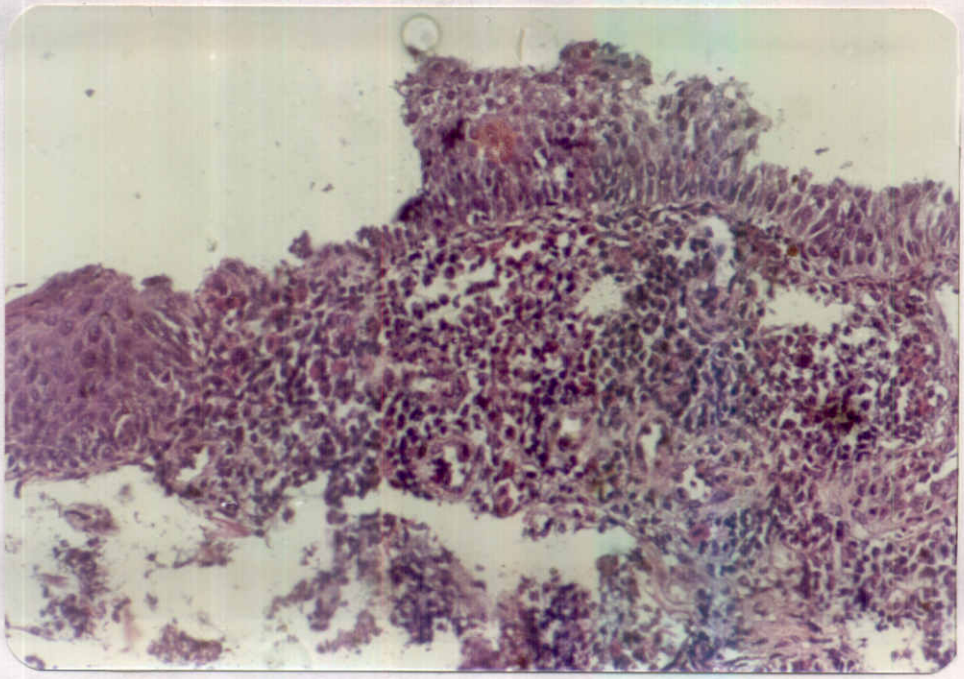

Fig.7: Atrophic rhinitis grade III, sinus.

Same changes as the nose of same grade.

(H & E x 125).

Endoscopic appearance of maxillary sinus:

In the first and second groups of patients, the mucous membrane was thin and yellowish in colour, with occasionally mucosal folds Fig.8.

The ostium of the maxillary sinus was always situated on the highest part of the medial wall close to its junction with the roof. Fig.8.

Variation in shape of the maxillary ostium were remarkable, it was either round (in 13 cases) oval, (in 10 cases) triangular (in 5 cases) or slite like (in 2 cases).

Accessory ostium is another normal variation, that was found on the medial wall of the antrum lower or posterior to the main ostium. It was smaller in size than the primary ostium. It was found only in 4 cases of our 30 examined cases.

No atrophic changes in maxillary sinus mucosa could be seen on sinoscopy in these two groups of patients by comparison to the normal finding of sinoscopic appearance.

The ciliary transport in these two groups was preserved (Fig.9), detected by transport of blood drops (produced by puncture) from floor of sinus towards ostium.

Impairing of ciliary function was observed in the third group of patients in which transport of blood drops (produced by puncture) towards ostium was delayed. Fig. 10,11.

In the third group of patients, atrophic change of maxillary sinus mucosa was detected by sinoscopic examination, mostly close to the ostium of the sinus which occasionally acquired marked patency Fig. 12. This change appeared as patchy areas of glazed thin mucosa Fig.13 (evidenced by absent light reflexes over the mucose with more pronounced underlaying bone, and absence of mucosal folds which could be detected occasionally in normal sinuses).

Apart from these changes, other parts of maxillary sinus appeared normal sinoscopically.

Out of 30 patients undergone antroscopy, 24 patients showed marked difficulty in piercing the bony wall of their canine fossa denoting thick bony wall of the antrum.

The cavity of the antrum was found to be small in size in almost all the cases.

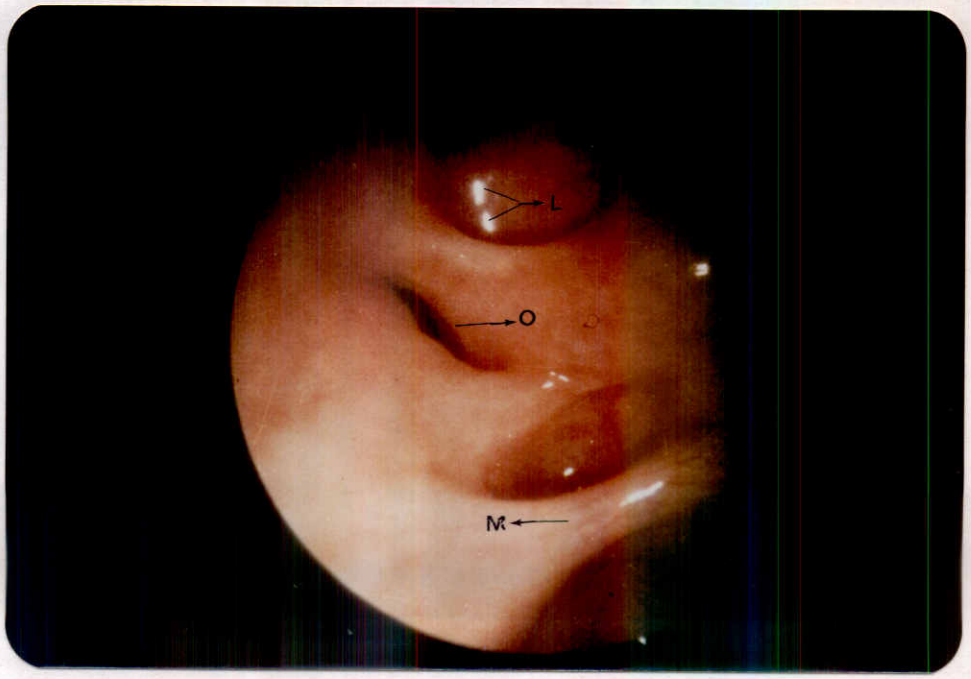

Fig. 8: Left ↖ oblique.

Normal sinoscopic appearance of maxillary sinus (1st grade).

L : light reflex.

M : Mucosal fold.

O : Ostium.

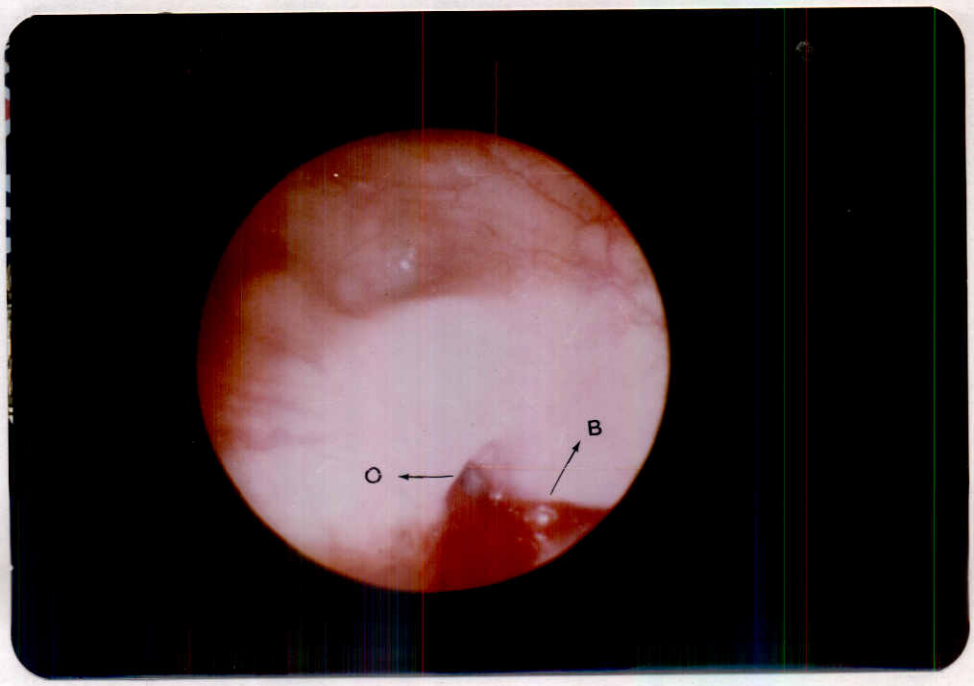

Fig.9: Right ↗ oblique

Sinoscopic appearance of maxillary sinus 30 minutes after puncture.

Normal ciliary function (2nd grade).

B : Blood trail.

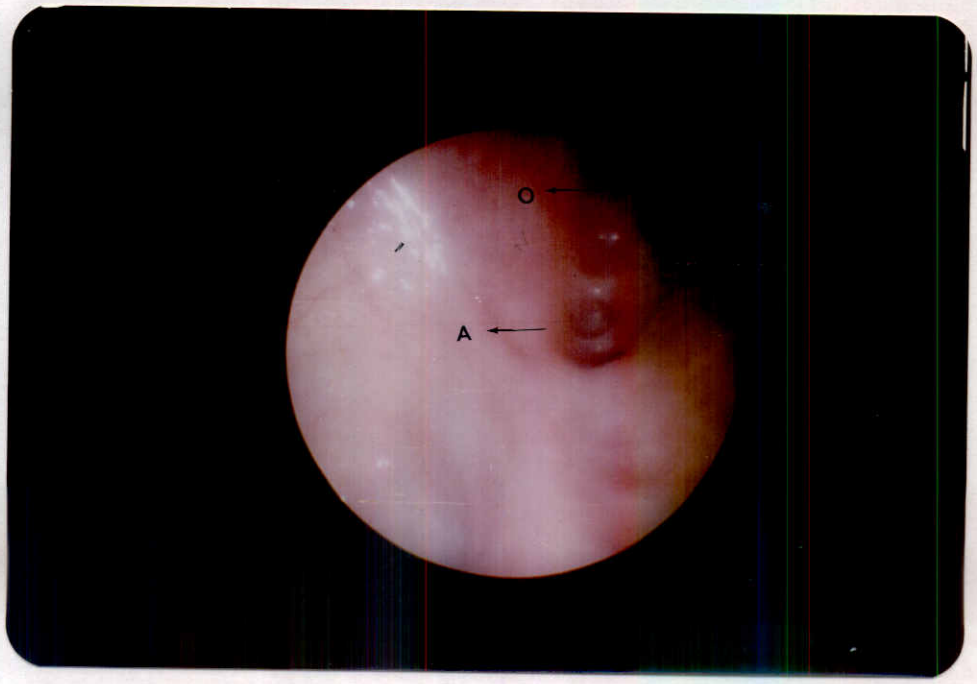

Fig.10: Right ↗ oblique.

Movement of a blood drop inside maxillary sinus with atrophic changes. Immediately after puncture (3rd grade).

(Blood drop moves from floor towarps medial wall)

O : Main ostium.

A : Accessory ostium.

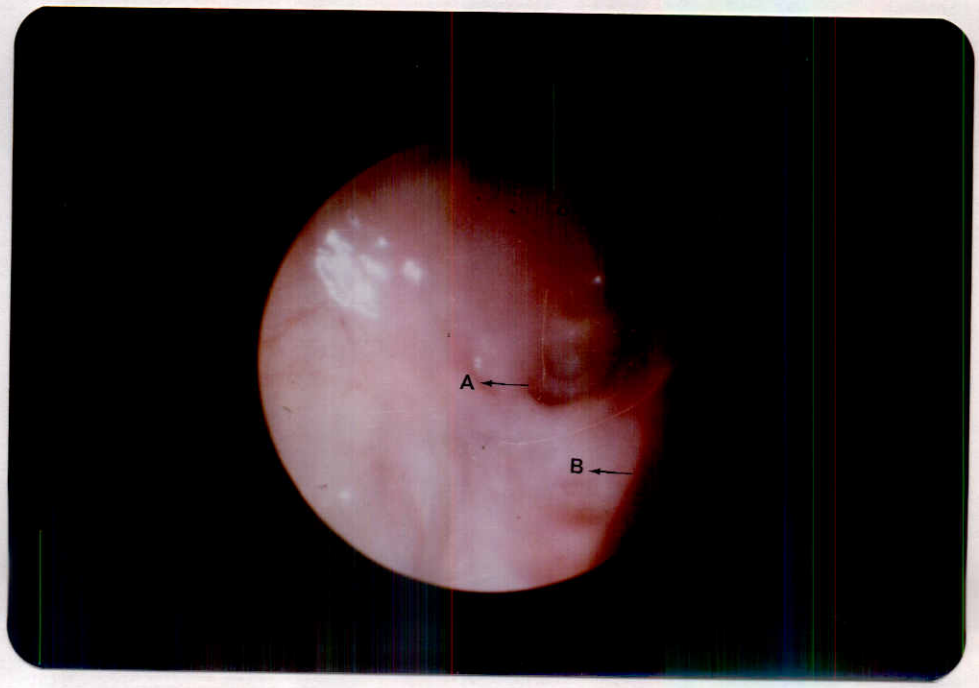

Fig.11: Right ↗ oblique.

Movement of a blood drop inside maxillary sinus with atrophic changes 30 minutes after puncture; arrested blood drop (3rd grade).

O : Main ostium.

A : Accessory ostium.

B : Trail of blood.

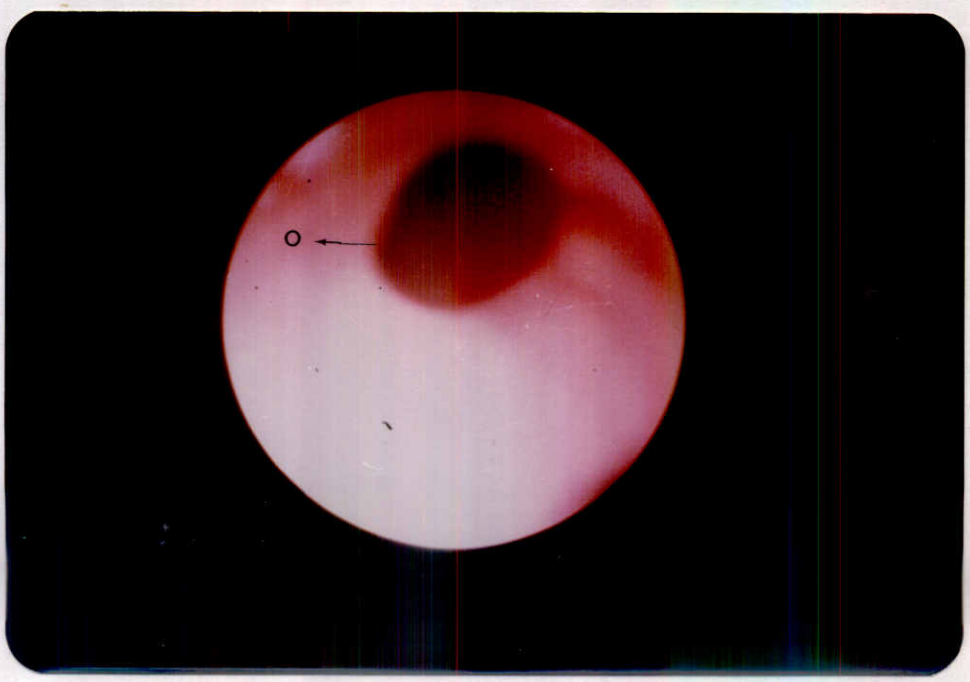

Fig. 12: Right ↗ oblique.

Abnormal patent ostium with atrophic changes in the mucosa (3rd grade).

O : ostium.

Fig. 13: Left ↖ oblique.

Sinoscopic appearance of atrophic changes of the maxillary sinus (3rd grade).

O : Main ostium.

A : Accessory ostium.

Results of bacteriological study:

Nasal swabs:

Two nasal swabs were taken from every case one from each side. The sum of 60 swabs culture results were illustrated in Table VI.

Table VI: Types of isolated organisms from nasal cavities.

Type of organism	Total number of cases	%	Grades of affection		
			I	II	III
Staphylococcus aureus	15	50.0	3	3	9
Escheriohia coli	8	26.7	2	3	3
Klebsiella ozaena	4	13.3	1	1	2
Proteus	3	10.0	-	1	2
Total	30	100.0	6	8	16

Table VI shows that staphyllococcus aureus was the most common organism isolated, it was found in 50% of cases (3 of them were in grade I,3 in grade II and 9

in grade III) followed by E. coli in 26.7% of cases, (2 of them were in grade I,3 in grade II and 3 in grade III), klebsiella ozaena in 13.3% of cases (1 of them was in grade I, 1 in grade II, and 2 in grade III) and proteus in 10% of cases (1 of them was in grade II and 2 in grade III but proteus was not isolated from any patient of grade I of affection).

The organisms isolated from right and left sides of nose of each patient were the same.

Maxillary sinus swabs:

Two maxillary sinus swabs were taken from every case one from each side. The sum of 60 swabs culture results were illustrated in table VII.

Table VII: Organisms isolated from maxillary sinuses.

Type of organism	Total number of cases	%	Grades of affection		
			I	II	III
No growth	13	43.3	5	3	5
Staphylloccocus aureus	5	16.7	1	-	4
Streptococcus pyogenus	5	16.7	-	2	3
Escherichia coli	4	13.3	-	2	2
Proteus	3	10.0	-	1	2
Total	30	100.0	6	8	16

Table VII shows that 43.3% of cases were sterile revealed by no growth from swabs taken from sinuses of 13 patients (5 of them were in grade I, 3 in grade II and 5 in grade III).

Staphyllococcus aureus and streptococcus pyogenus form most of the isolated organisms. Staphylloccocus aureus was found in 16.7% of cases (1 of them was in grade I and 4 in grade III), streptococcus pyogenus was found also in 16.7% of cases (2 of them were in grade II and 3 in grade III), followed by E. coli in 13.3% of

cases (2 of them were in grade II and 2 in grade III), and Proteus in 10% of cases (1 of them was in grade II and 2 in grade III).

So, in grade I of affection, streptococcus pyogenus, E. coli and proteus were not isolated.

The organisms isolated from right and left sinus of each patient were the same.

In comparison to results obtained from nasal swabs, it was found that there were 12 patients (40% of cases) had the same organism in both nose and maxillary sinus in 5 staphylococcus aureus, in 4 E. coli, and in 3 proteus.

Klebsiella ozaena could not be isolated in any of our positive maxillary sinus swabs.

Table VIII shows results of examination of 30 patients with primary atrophic rhinitis.

Table VIII: Results of examination of 30 patients with primary atrophic rhinitis.

Case No.	Age in years	Sex	Family history	Clinical picture of nose			
				Nasal obstruction	Scales & epistaxis	Foul odour & anosmia	Mucosa
1	19	♀	+ve	+	+	+	Congested.
2	19	♀	-ve	+	+	+	Congested.
3	18	♀	-ve	+	+	+	Atrophy of inferior turbinate.
4	20	♀	-ve	+	+	+	Atrophy of inferior turbinate.
5	21	♀	-ve	+	+	+	Atrophy of both turbinates.
6	13	♀	-ve	+	+	+	Congested.
7	32	♂	-ve	+	+	+	Atrophy of both turbinates.
8	37	♂	-ve	+	+	+	Atrophy of both turbinates.

Table XIII: Results of examination of 30 patients with primary atrophic rhinitis.(Cont.)

Case No.	Age in years	Sex	Family history	Clinical picture of nose			
				Nasal obstruction	Scales & epistaxis	Foul odour & anosmia	Mucosa
9	16	♀	-ve	+	+	+	Atrophy of both tur.
10	26	♀	+ve	+	+	+	Atrophy of both tur.
11	28	♀	-ve	+	+	+	Atrophy of both tur.
12	19	♀	-ve	+	+	+	Atrophy of both tur.
13	32	♂	-ve	+	+	+	Atrophy of both tur.
14	17	♂	+ve	+	+	+	Atrophy of inf. tur.
15	13	♀	+ve	+	+	+	Congested.
16	16	♀	+ve	+	+	+	Atrophy of both tur.

Table VIII: Results of examination of 30 patients with primary atrophic rhinitis. (Cont.)

Case No.	Age in years	Sex	Family history	Clinical picture of nose: Nasal obstruction	Scales & epistaxis	Foul odour & anosmia	Mucosa
17	22	♀	-ve	+ -	+	+ -	Atrophy of both tur.
18	25	♂	-ve	+ -	+	+	Atrophy of both tur.
19	14	♀	-ve	+ -	+	+	Atrophy of inf. tur.
20	31	♀	+ve	+ -	+	+	Atrophy of both tur.
21	23	♂	-ve	+ -	+	+	Atrophy of inf. tur.
22	19	♀	-ve	+ -	+	+	Atrophy of inf. tur.
23	32	♀	-ve	+ -	+	+	Atrophy of both tur.
24	15	♀	-ve	+ -	+	+	Congested.

Table VIII: Results of examination of 30 patients with primary atrophic rhinitis (Cont.)

Case No.	Sinoscopic appearance of sinus	Organism isolated from nose	Organism isolated from sinus	Period of affection in years	Grade of affection
17	Atrophic changes	Staph. aureus	Staph. aureus	More than three	3rd
18	Atrophic changes	Staph. aureus	No growth	More than three	3rd
19	Normal	E. coli	E. coli	Less than three	2nd
20	Atrophic changes	Staph. aureus	Staph. aureus	More than three	3rd
21	Normal	E. coli	Strept. pyogenus	Less than three	2nd
22	Normal	Staph. aureus	Strept. pyogenus	Less than three	2nd
23	Atrophic changes	E. coli	E. coli	More than three	3rd
24	Normal	E. coli	No growth	Less than one	1st

Table VIII: Results of examination of 30 patients with primary atrophic rhinitis(Cont.)

Case No.	Age in years	Sex	Family history	Clinical picture of nose			
				Nasal obstruction	Scales & epistaxis	Foul odour & anosmia	Mucosa
25	16	♀	+ve	+ -	+	+	Atrophy of inf. tur.
26	29	♀	+ve	+ -	+	+	Atrophy of both tur.
27	13	♀	-ve	+ -	+	+	Congested.
28	17	♀	+ve	+ -	+	+	Atrophy of Inf. tur.
29	28	♀	-ve	+ -	+	+	Atrophy of both tur.
30	33	♂	-ve	+ -	+	+	Atrophy of both tur.

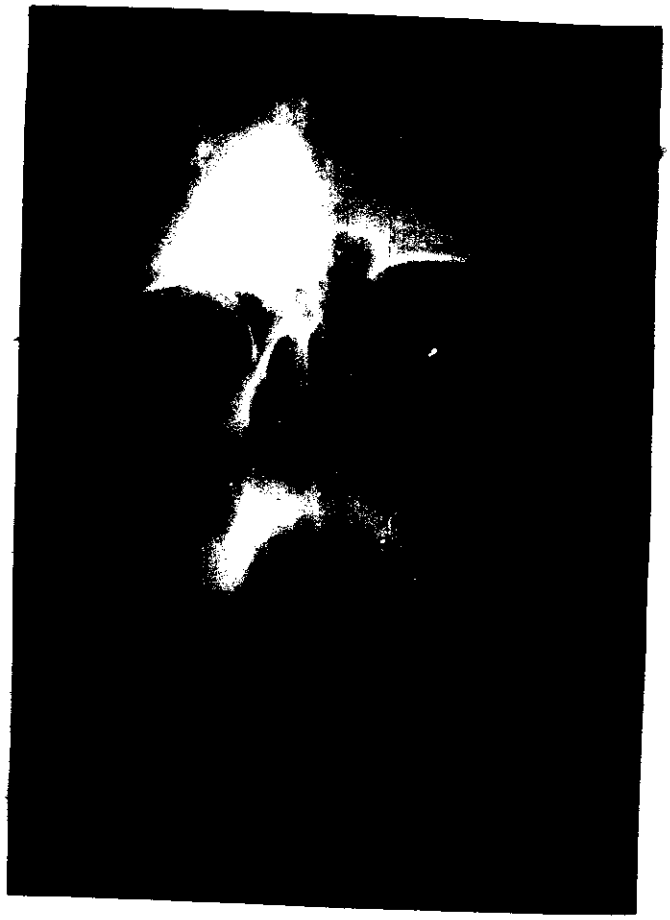

Fig.15: X-ray of maxillary sinuses, occipitomental view with open mouth, showing small sized cavity of both maxillary sinuses, with partial opacity of right side.

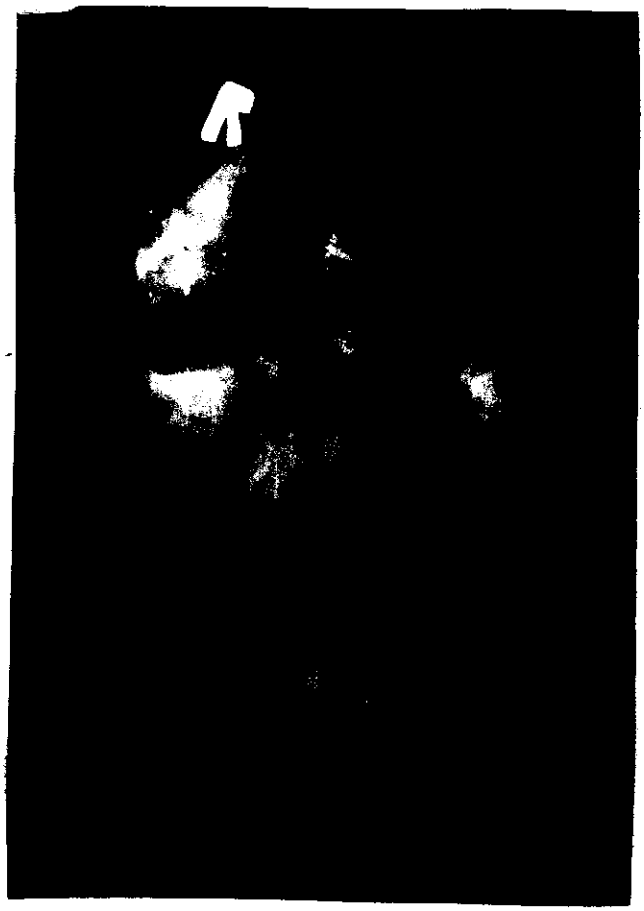

Fig.16: X-ray of maxillary sinuses, occipitomental view with open mouth, showing small sized cavity of both maxillary sinuses with complete opacity of right side and partial opacity of left side.