RESULTS

This study was conducted on 30 patients attending Benha University Hospital outpatient clinic in the period from June 2004 to December 2005.

They attended the outpatient clinic complaining of different symptoms either single symptom or multiples; Some were complaining only of whistling, others were complaining only of repeated crusts, others were complaining only of repeated epistaxis while others were complaining of more than one symptom.

The patients were divided into 3 groups I, II and III according to the graft material used for the repair of the nasal septal perforation, each group included 10 patients of different, ages, sex, etiology, symptoms.

* Age distribution:

The ages of the patients ranged from 19 to 35 years in all groups with no statistical significant difference between patients of the 3 groups as $P > 0.05$ table (2) figure(27).

* Sex distribution:

The 30 patients of the three groups were included 19 males and 11 females whom distributed randomly in between the three groups. The sex difference was of no statistical significant value as $p > 0.05$ table (3) figure(28).

* Sit of the perforation:

Of the 30 patients of the three groups 22 cases were have an anterior septal perforation (cartilaginous) while 8 cases were have posterior septal perforation (bony) distributed randomly in between the three groups, this distribution of no statistical significant value as $P > 0.05$ table (4) figure(29).

However the site of perforation was of statistical significant value in relative to the success rate as $P < 0.05$ table (5) figure(30). anterior perforations were easily to be repaired with 90% success rate (20/22 of cases) while posterior perforations were succeeded by 50% (4/8 of cases).

* Size of the perforation:

The study was conducted on 30 patients have septal perforation of different sizes ranged from 0.5 × 0.5 cm to 2×2 cm. The size of the perforation played a significant value in the success rate: the cases with small perforations succeeded by 95.5% (21/22 of cases) while those with large ones succeeded

by 37.5% (3/8 of cases). This difference in the success is of highly significant value as P < 0.001 table (6) figure(31).

* Etiology of the perforation:

The 30 patients were having a nasoseptal perforation of different etiology; 25 cases of them were as a result of pervious surgical trauma either Kilian submucous resection or septoplasty, one case was as a result of repeated cauterization as a treatment for recurrent epistaxis while 4 cases were as a result of chronic inflammation of the nasal cavity (the 4 cases were old tuberculous cases). They were distributed randomly among the three groups with no statistical significant value as P > 0.05 table (7) figure(32).

The etiological factor was of a statistical significant value in relative to the success rate as the healing process depended on the etiology as P < 0.05 ; patients due to trauma and cautery succeeded by 84.6% (22/26 of cases) while patients due to old T.B succeeded by 50% (2/4 of cases) table(8) figure(33).

Reperforations were appeared in 50% of patients who were old T.B as the chronic infermathion show dense fibrosis and difficult dissection in the repair, also due to decrease vascularity of the tissues.

* Associated pathology:-

Of the 30 patients 20 cases were having only a septal perforation and no associated pathology, while 10 cases were have associated local pathology either septal spurs, bony specula or septal crest. The distribution of patients with or without local pathology in between the three groups was of no statistical significant value as $P > 0.05$ table (9) figure(34).

The presence of associated local pathology was of a highly statistical significant value in the success rate as $P < 0.001$. patients were with associated local pathology succeeded by 40% (4/10 of cases) and reperforation appeared in 6 cases , while those without associated local pathology succeeded by 100% (20/20 of cases) table (10) figure(35). The local pathology made the dissection of the mucosal flaps difficult and the flaps were not sizable to cover the septal perforation and the graft. Straightening of the deviated part or removal of the crest using sharp instruments may be complicated with mucosal tears which offered more difficulties and increase incidence of reperforation.

* Success rate:-

It varies in the 3 groups as the following;

In group I: repair of septal perforation with tragus perichondrium was succeeded by 70% i.e. 7 patients have a good healing result figure (22) while 3 patients failed

(reperforation). One of the 3 cases; reperforation had appeared 3 weeks postoperatively and the failure in this case was attributed to the posterior location of the perforation and to the presence of associated septal pathology (septal spure). The other 2 cases of the 3; reperforation had appeared 2 weeks postoperatively and this was attributed to their etiological factor (the 2 cases were old T.B), also due to presence of associated septal pathology as well as their large sizes(one was 1 × 2 Cm, the other was 2 × 2 Cm).

in group II : repair of septal perforation with the use of acellular human dermal graft was succeeded by 90% i.e. 9 patient have a complete successfull result figure (23) while 1 patient failed and has a reperforation which appeared on removal of the silastic splint. This failure was attributed to the posterior location of the perforation and its large size as well as the presence of associated septal pathology.

In group III : repair of septal perforations with inferior turbinate was succeeded by 80% i.e. 8 patients have a good healing result figure (24) while 2 patients were have reperoration which appeared on the 4^{th} weeks postoperatively. The reperforation in one case of the 2 was due to its posterior location and its large size while the other case was reperforated

due to the same causes as well as the presence of associated septal pathology (septal deviation).

The difference in the success inbetween the 3 groups has no statistical significant value as P > 0.05 table (11). figure(36).

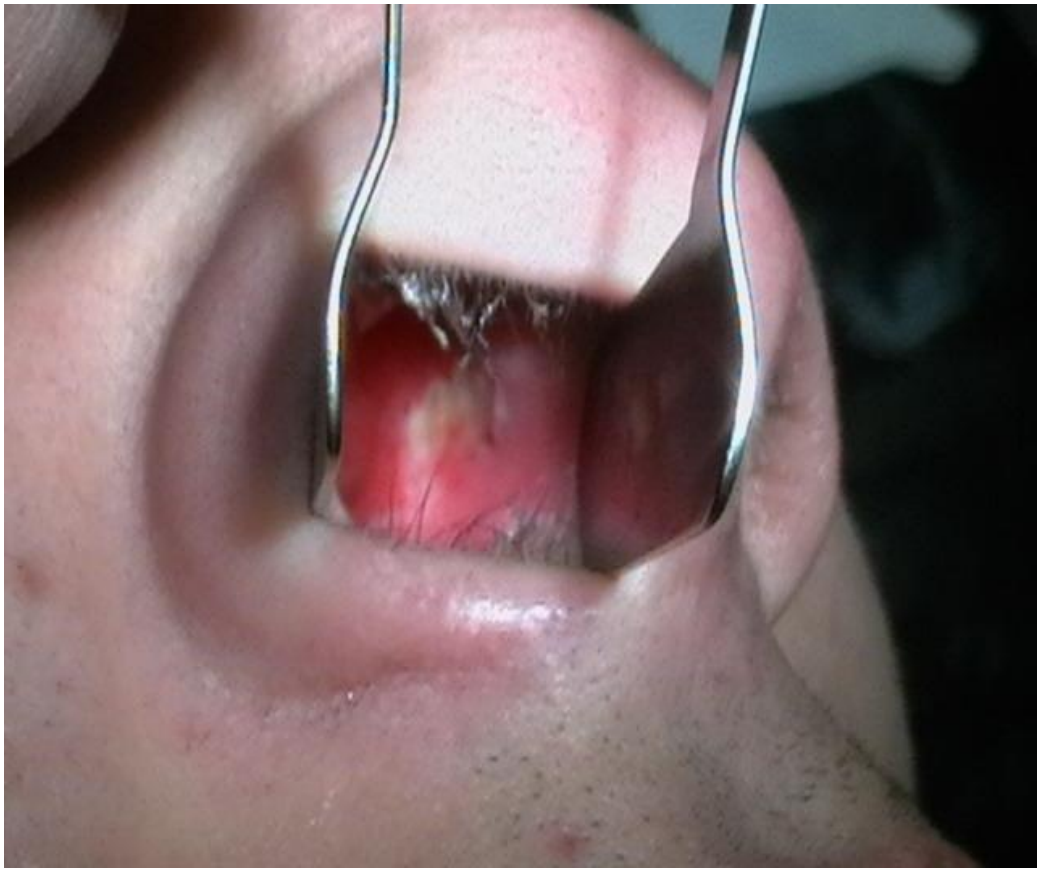

Figure (22) photograph shows healed septal perforation with the use of tragus perichondrium.

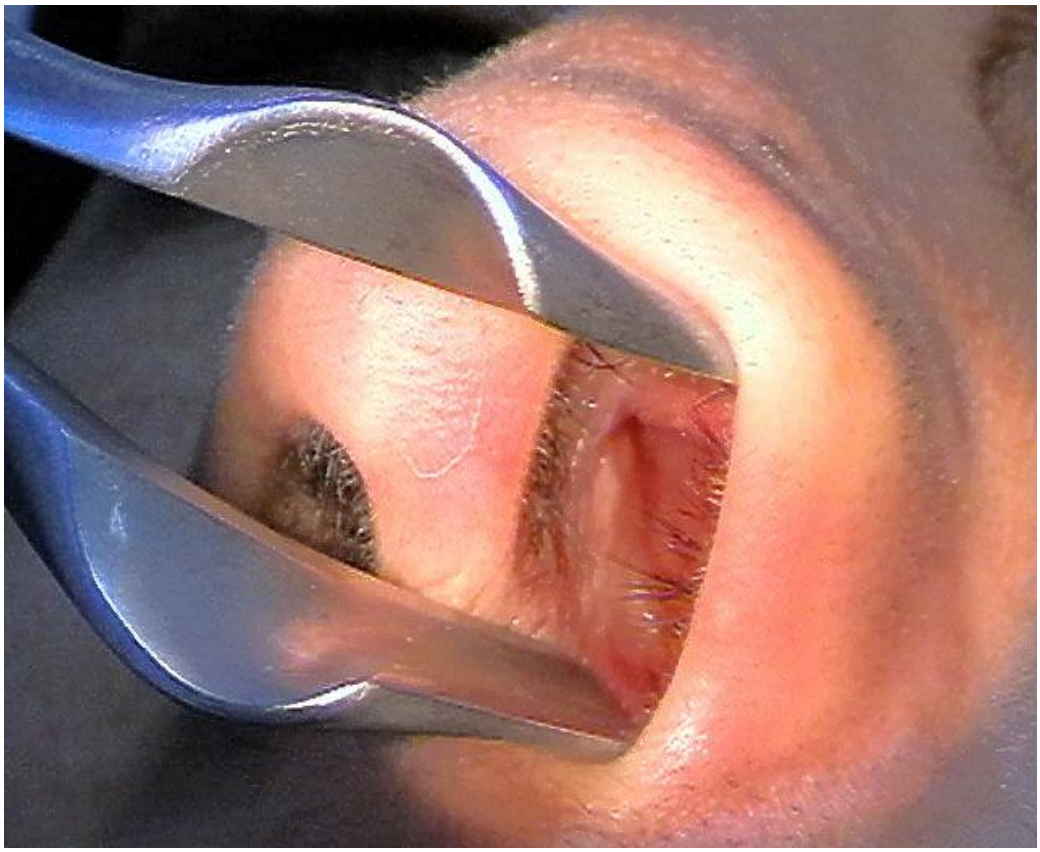

Figure (23) photograph shows healed septal perforation with the use of alloderm.

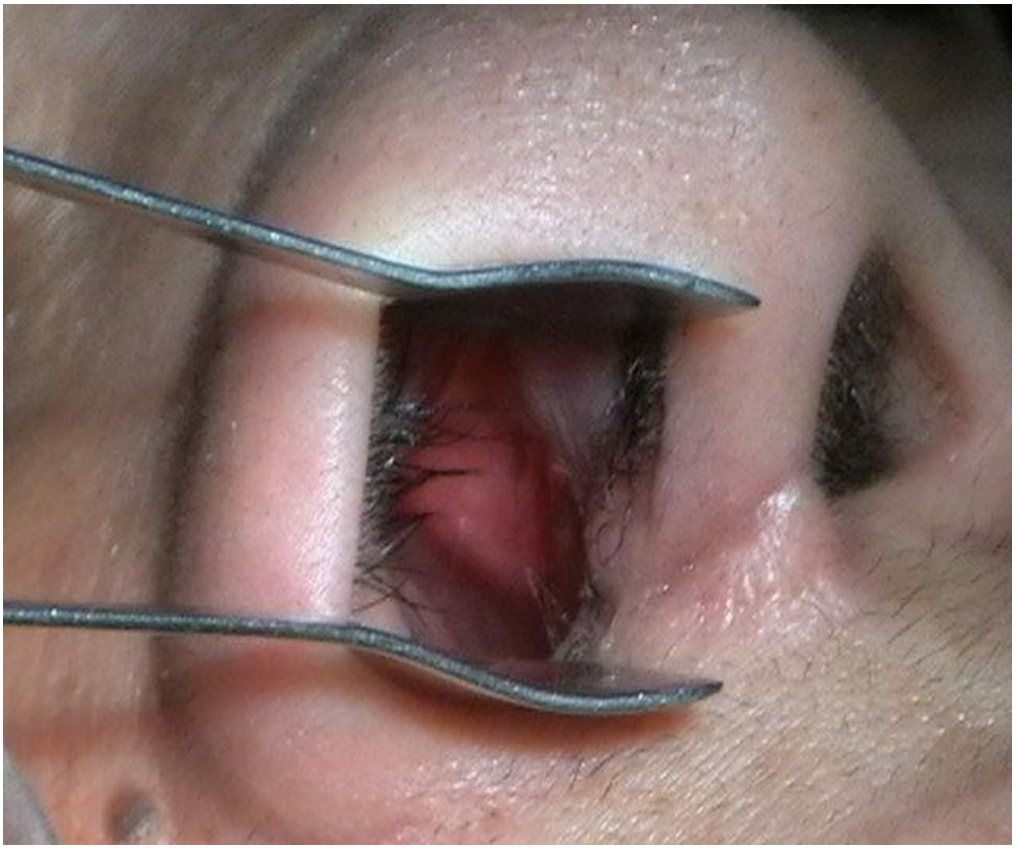

Figure (24) photograph shows healed septal perforation with the use of inferior turbinate flap.

* Postoperative complications: table (12):

Stenosis **:**Stenosis of nasal vestibule either in one or both nostrils was one of the complications we found in our results. Stenosis occurred in group I in 20% of patients i.e. 2 patients were have a good healing and success in the repair of the nasoseptal perforation but they were have a vestibular stenosis in both nostrils figure (25). while in group II only one case appeared to have a vestibular stenosis in one nostril i.e. 10% of cases. But patients of group III (repair with inferior turbinate flap) were have no vestibular stenosis .

The stenosis that occurred in group I and II was a result of creating free mucosal flaps from the remaining mucosa on both sides of the septum and nasal floor leaving a raw surface healed with a dense fibrosis which is the cause of stenosis, while in group III the repair with inferior turbinate didn't leave a raw surface on the nasal floor so no stenosis occurred.

Bleeding **:** In patients of group I and II; on removal of vaseline pack 48h postoperatively there were minimal bleeding which stopped with application of ephedrine pack. This bleeding was of no value similar to any nasal operation but in group III three weeks after the operation the pedicle of the inferior turbinate flap was taken down and excised this resulted in massive bleeding in 2 cases of the 10 patients. This bleeding

didn't stop with ephedrine pack but needed the diathermy to be stopped.

Crusts : Patients of group I and II in the postoperative follow up showed minimal crusts which need normal saline to be washed out. These crusts were of the ordinary minimal amount as that of any nasal operation. While in group III the crusts were of large amount presented in the follow up period for longer time than in group I and II and we were in need to remove the adherent crusts from the nasal cavity every follow up visit inspite of using normal saline by patients to clean their nose.

Synachia : synachia was one of the complications we faced in our study. It was appeared in patients of group III only by 20% i.e. 2 cases have shown unilateral synachia 2 weeks postoperatively after release of the pedicle of the inferior turbinate. The synachia was on the side of the inferior turbinate flap it was due to the bulky tissue of the inferior turbinate and adherence of its raw surface to its base on the lateral nasal wall. While in patients of group I and II. The persence of the silastic splints on both sides of the septum prevent the occurance of synachia.

Nasal obstruction : 2 weeks postoperatively 3 patients of group III have shown unilateral nasal obstruction figure (26) i.e. 30% of cases have shown this complication which was due to

the presence of the bulky tissue graft (bulky inferior turbinate graft) and its raw base on the lateral wall of the nose. While patients of group I and II have no nasal obstruction.

Dealing with the repair of the nasoseptal perforation was difficult and we faced many problems either in the preparation, operative steps and also in the postoperative periods of follow up.

Preoperatively, the persuasion of the patient to undergo an operation without a guaranteed success, the frustrating opinion of other colleagues about the surgical repair of the septal perforation and the concept of septal perforation being more or less common sequel of septal surgery made it difficult in decision making by the patient to undergo this surgery.

The preparation of the patient for surgery generally and locally as the adjustment of hemoglobin percentage as anemia not only makes the operation risky but also interferes with good healing, also control of blood sugar in diabetic patient needed a time for adjustment as diabetes not only a risk factor intra operatively but also it affects the healing process due to its neuropathy and vasculopathy factors which in turn affect the results.

Locally the viability of the mucosa , complete eradication of any local infection, crusts and keeping the mucous membrane

moist and healthy at least 2 weeks before the operation is very important step.

Intraoperative there were many problems as:

- The presence of fibrosis due to previous surgery made the dissection of the mucosal flaps so difficult than in normal septa.

- The distorted anatomy in many cases made it more difficult in dissection and creating a relaxed flap.

- The presence of spurs, deviated crests, bony specules were a common finding, where their removal were important to create although relaxed flaps, their removal with the use of sharp instruments exposed the flaps for new tears and affected to sometime the orientation of the flaps and there ideal position.

In addition, the postoperative follow up we faced non compliance of some patients because of the large period of follow up we decided.

Figure (25): photograph shows a case of repaired septal perforation complicated with a unilateral vestibular stenosis.

Figure (26) photograph shows a case of repaired septal perforation complicated with nasal obstruction due to bulky tissue graft used in repair (inferior turbinate).

Table (1) shows the master sheet including ages ,sex, site, sizes in cm, etiology, and associated pathology in all patients of the 3 groups:

Groups patients	Age	Sex	Site	Size in cm	Etiology	Associated pathology
Group I						
1	25	Male	Posterior	0.5×0.5	Trauma	+ ve
2	20	Male	Anterior	1 × 0.5	Trauma	- ve
3	31	Female	Anterior	1 × 1	Trauma	- ve
4	19	Male	Anterior	1.5× 1.5	T.B	+ ve
5	20	Female	Posterior	1 × ١.٥	Trauma	- ve
6	20	Female	Anterior	١ × 2	Trauma	- ve
7	22	Male	Anterior	0.5 × 1	Trauma	- ve
8	31	Female	Anterior	1 × 1	Trauma	- ve
9	34	Male	Anterior	2 × 2	T.B	+ ve
10	26	Male	Anterior	1 × 1.5	Trauma	- ve
Group II						
A	35	Male	Posterior	2 × 2	Trauma	+ ve
B	30	Female	Anterior	0.5 × 1	Trauma	- ve
C	29	Male	Anterior	1 × 1	T.B	+ ve
D	24	Male	Anterior	1 × 1.5	Trauma	- ve
E	23	Female	Anterior	1 × 1	Trauma	+ ve
F	27	Male	Anterior	2 × 2	Trauma	- ve
G	27	Male	Anterior	1 × 0.5	Trauma	+ ve
H	29	Male	Anterior	0.5 ×0.5	T.B	+ ve
I	21	Female	Posterior	1.5 × 0.5	Trauma	- ve
J	19	Male	Anterior	1.5 × 1.5	Trauma	- ve
Group III						
I	27	Male	Anterior	0.5 × 0.5	Trauma	- ve
II	30	Female	Anterior	1 × 1	Trauma	- ve
III	29	Male	Anterior	1 × 1	Trauma	-ve
IV	21	Female	Posterior	1 × 1.5	Trauma	+ve
V	22	Male	Anterior	1 × 1.5	Trauma	-ve
VI	30	Male	Posterior	2 × 2	Cautery	+ ve
VII	32	Male	Anterior	1 × 0.5	Trauma	- ve
VIII	33	Female	Anterior	0.5× 0.5	Trauma	- ve
IX	30	Female	Posterior	1 ×0.5	Trauma	- ve
X	29	Male	Posterior	1 × 1	Trauma	- ve

Table (2) shows means ± SD of ages of the patients of the 3 groups:

Age Group	$\bar{X}$ ± s d	One way anova F	P
I	24.8 ± 5.5		
II	26.4 ± 4.7	1.35	>0.05
III	28.3 ± 3.9		

This table shows the mean ($\bar{X}$) and the standard deviation (SD)of ages of patients of the 3 groups revealing that there is no statistical significant difference among patients of the 3 groups as **P** > 0.05.

Fig (27) Chart shows means of ages of the patients of the 3 groups

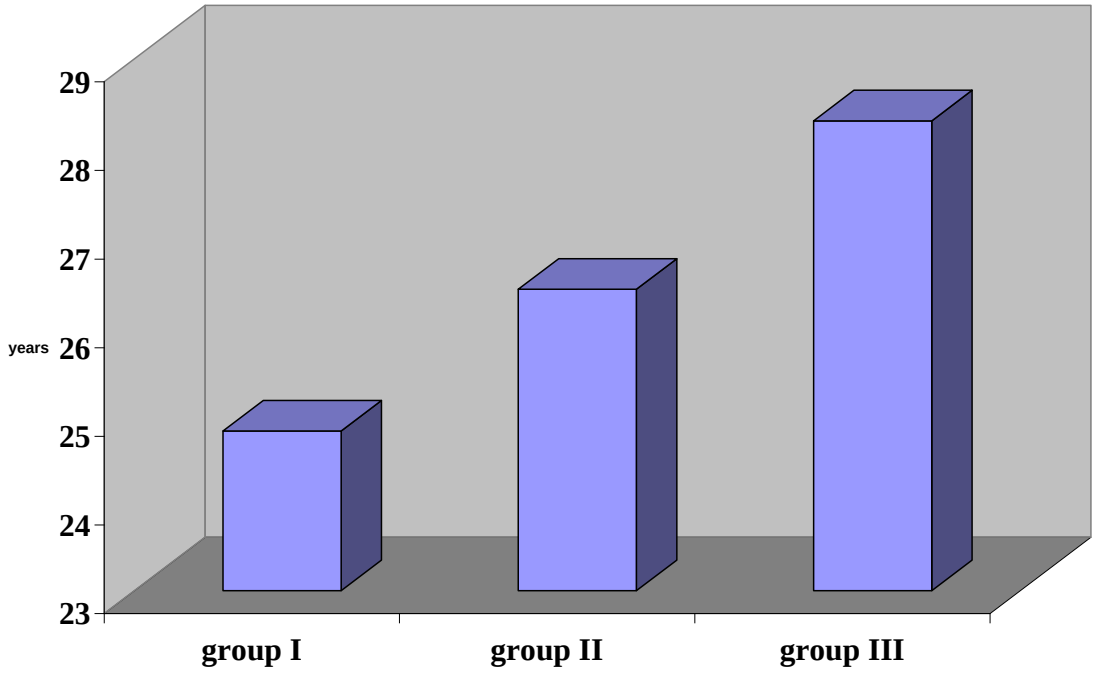

Table (3) shows distribution of patients among the 3 groups according to sex:

Sex / Group	Males		Females		Total	
	No	**%**	**No**	**%**	**No**	**%**
I	6	60.0	4	40.0	10	100.0
II	7	70.0	3	30.0	10	100.0
III	6	60.0	4	40.0	10	100.0
Total	19	63.3.0	11	36.75.0	30	100.0

Chi-square:- $\mathbf{X^2}$ = 0.29 **P** > 0.05

This table reveals that there is no statistical significant differences among the patients of the 3 groups regarding the sex as **P** > 0.05.

Fig (28) Chart shows distribution of patients of the 3 groups according to sex:

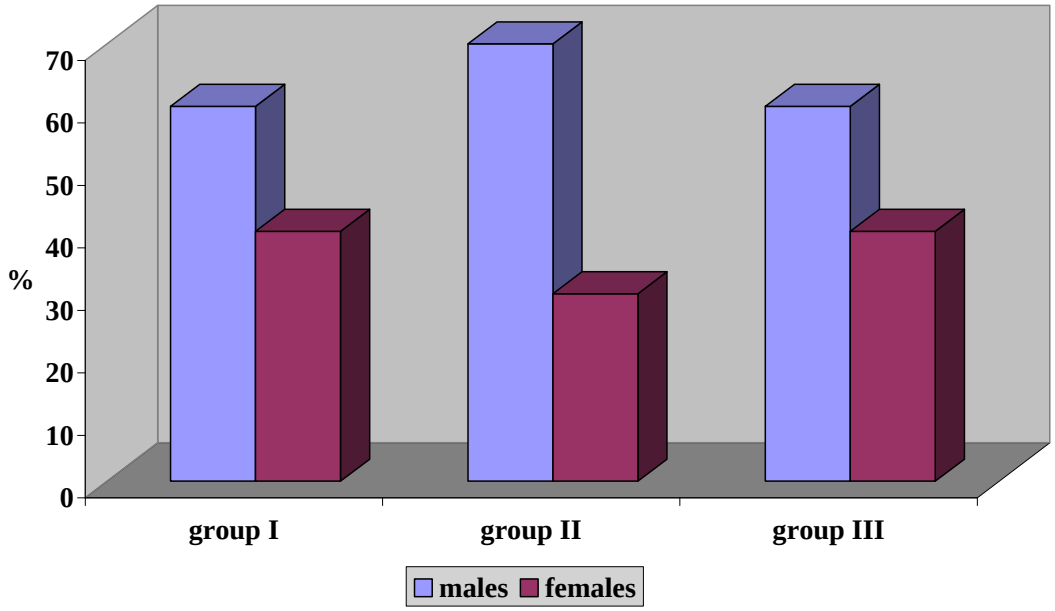

Table (4) shows distribution of patients according to the site of the septal perforation:

Site / Group	Anterior No	Anterior %	Posterior No	Posterior %	Total No	Total %
I	8	80.0	2	20.0	10	100.0
II	8	80.0	2	20.0	10	100.0
III	6	60.0	4	40.0	10	100.0
Total	22	73.3.0	8	26.7.0	30	100.0

Chi square:- X^2 = 1.36 **P** > 0.05

This table reveals that there is no statistical significant difference in distribution of patients among the 3 groups according to the site of the septal perforation as **P** > 0.05.

Fig (29) Chart shows distribution of patients according to the site of septal perforation:

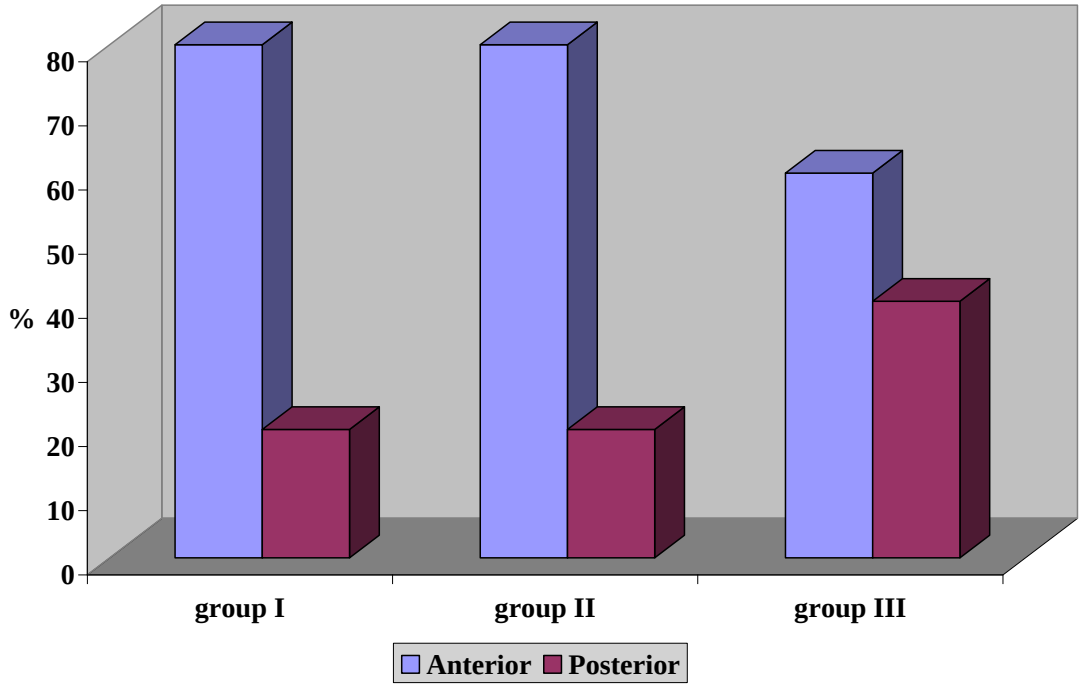

Table (5) shows the success rate according to the site of the septal perforation:

Success Site	Succeeded No	%	failed No	%	Total No	%	X2	P
anterior	20	90.1.0	2	9.1.0	22	100.0	3.85	P<0.05
Posterior	4	50.0	4	50.0	8	100.0		
Total	24	80.0	6	20 .0	30	100.0		

Chi square:- X^2 = 3.85 **P** < 0.05

This table shows the success rate according to the site of the septal perforation; revealing that the success rate in cases with anterior septal perforations is 90.1% and in cases with posterior perforations is 50%.

This difference in the success rate between the anterior and the posterior septal perforation is of statistical significant value as **P** < 0.05.

Fig (30) Chart shows the success rate according to the site of the septal perforation:

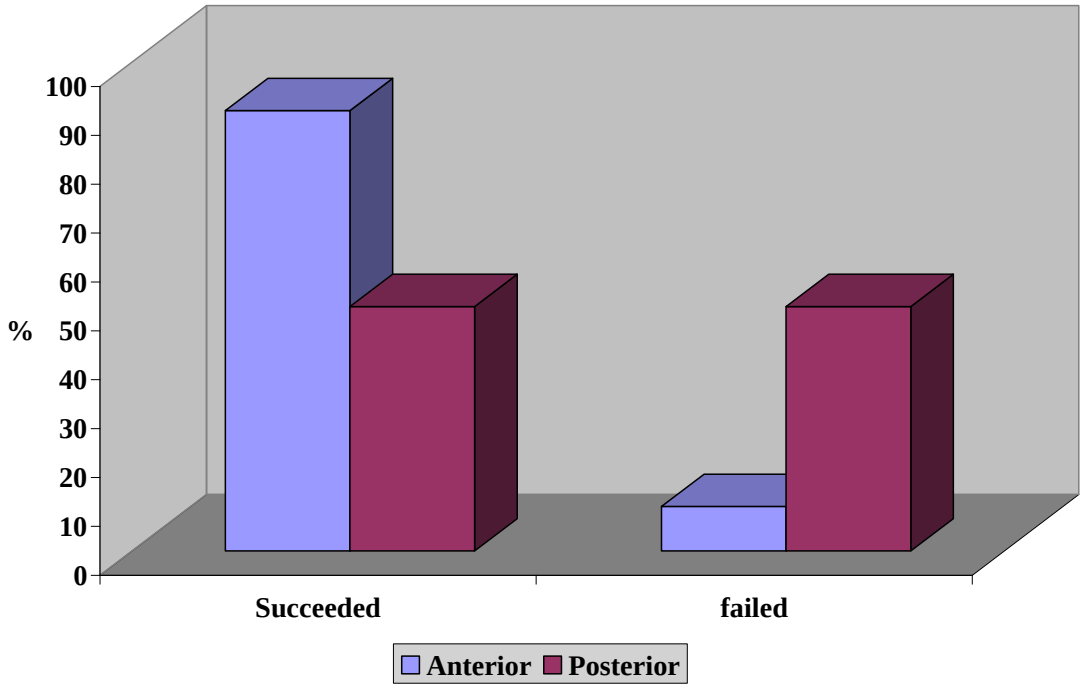

Table (6) shows the success rate according to the size of the septal perforation:

Success Size	Succeeded No	%	failed No	%	Total No	%	X2	P
Small (< 1.5 × 1.5 cm)	21	95.5.0	1	4.5.0	22	100.0	8.96	P< 0.001
Large (≥ 1.5 ×1.5 cm)	3	37.5.0	5	62.5.0	8	100.0		
Total	24	80.0	6	20 .0	30	100.0		
Test of Significance	Z = 3.51				P < 0.01			

Chi square:- X^2 = 8.96 **P** < 0.001

This table shows the success rate regarding the size of the perforation (small < 1.5× 1.5 cm or large ≥ 1.5 ×1.5 cm) revealing that the cases with small perforations succeeded by 95.5% (21 / 22 of cases) while those with large ones succeeded by 37.5% (3 / 8 of cases) This difference in the success is of highly statistical significant value as **P** < 0.001.

Fig (31) Chart shows the success rate according to the size of the septal perforation:

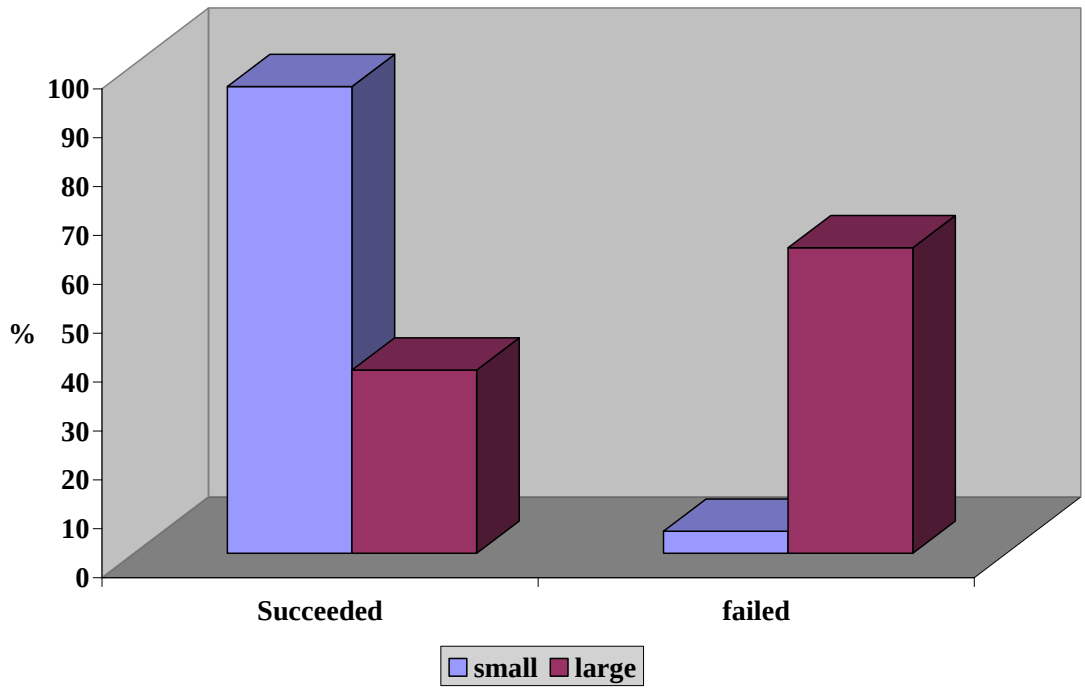

Table (7) shows distribution of patients among the 3 groups according to the etiology of the septal perforation

Etiology group	Trauma		T.B		cautery		Total	
	No	%	No	%	No	%	No	%
I	8	80.0	2	20.0	0	0	10	100.0
II	8	80.0	2	20.0	0	0	10	100.0
III	9	90.0	0	0	1	10.0	10	100.0
Total	25	83.3.0	4	13.3 .0	1	3.4.0	30	100.0

Chi square:- $X^2 = 4.09$ **P >** 0.05

This table reveals that there is no statistical significant difference in the distribution of the patients among the 3 groups according to the etiology of the septal perforation as **P >** 0.05**.**

Fig (32) Chart shows distribution of patients of the 3 groups according to the etiology of the septal perforation

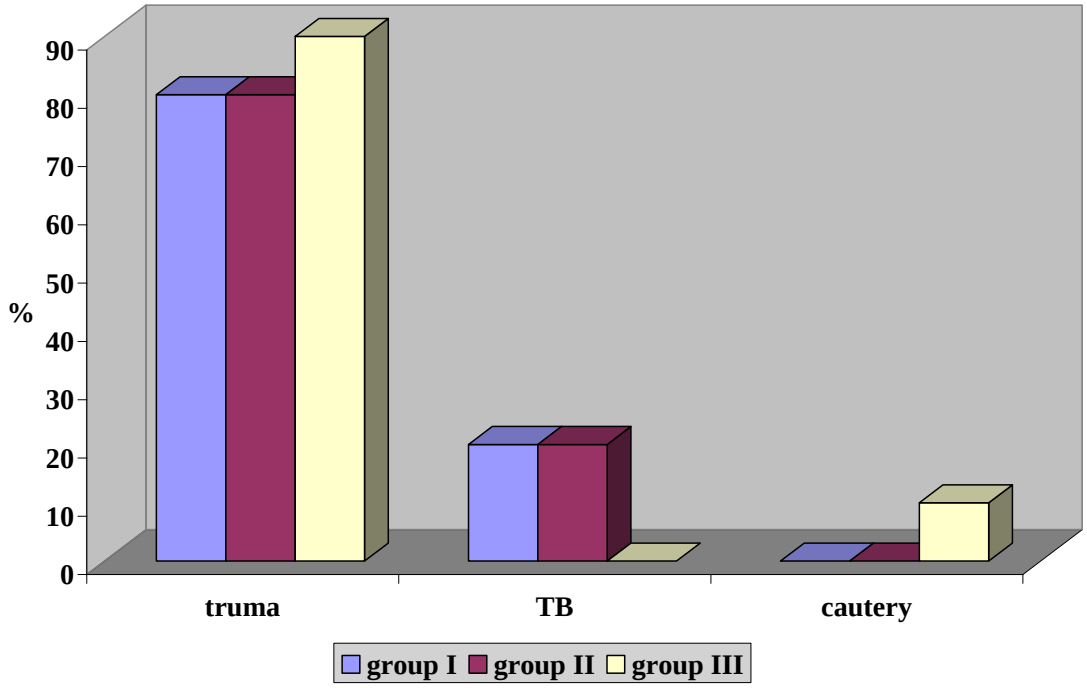

Table (8) show the success rate of cases according to the etiology of the septal perforation:

Success / Etiology	Succeeded No	Succeeded %	failed No	failed %	Total No	Total %	X2	P
T.B	2	50.0	2	50.0	4	100.0	0.88	P< 0.05
Trauma & cautery	22	84.6.0	4	15.4.0	26	100.0		
Total	24	80.0	6	20 .0	30	100.0		
Test of Significance	Z = 1.62				P < 0.05			

Chi square:- X^2 = 0.88 **P** < 0.05

This table shows the success rate according to the etiology of the septal perforation revealing that the success rate in patients due to trauma and cautery is 84.6% while those due to old T.B is 50%.

This difference in the success is of statistical significant value as **P** < 0.05.

Fig (33) Chart shows the success rate of cases according to the etiology:

Table (9) shows distribution of patients among the 3 groups according to the presence or absence of associated local pathology:

pathology Group	+ ve		- ve		Total	
	No	%	No	%	No	%
I	3	30.0	7	70.0	10	100.0
II	5	50.0	5	50.0	10	100.0
III	2	20.0	8	80.0	10	100.0
Total	10	33.3.0	20	66.7.0	30	100.0

Chi square:- $X^2 = 2.1$ **P** > 0.05

This table reveals that there is no statistical significant difference in the distribution of patients either with or without associated local pathology among the 3 groups as **P** > 0.05.

Fig (34) Chart shows distribution of patients of the 3 groups according to the presence or absence of associated local pathology:

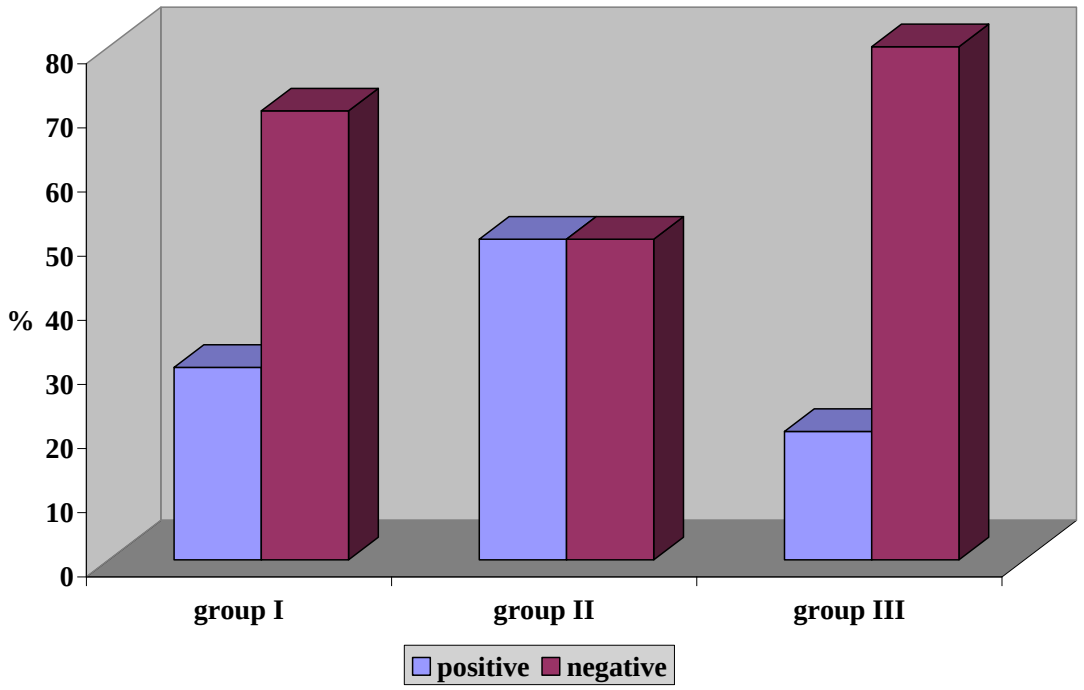

Table (10) show the success rate of cases according to the presence or absence of associated local pathology:

Success pathology	Succeeded No	%	failed No	%	Total No	%	X2	P
+ ve	4	40.0	6	60.0	10	100.0	11.48	P< 0.001
- ve	20	100.0	0	0	20	100.0		
Total	24	80.0	6	20 .0	30	100.0		
Test of Significance	**Z** = 3.87				**P** < 0.001			

Chi square:- X^2 = 11.48 **P** < 0.001

This table shows the success rate according to the presence (+ve) or absence (-ve) of associated local pathology revealing that the patients with associated local pathological lesions succeeded by 40% (4 / 10 of cases), while those without associated local pathology succeeded by100% (20 / 20 of cases).

This difference in the success rate is of highly significant value as **P** < 0.001.

Fig (35)chart shows the success rate of cases according to the presence or absence of associated local pathology:

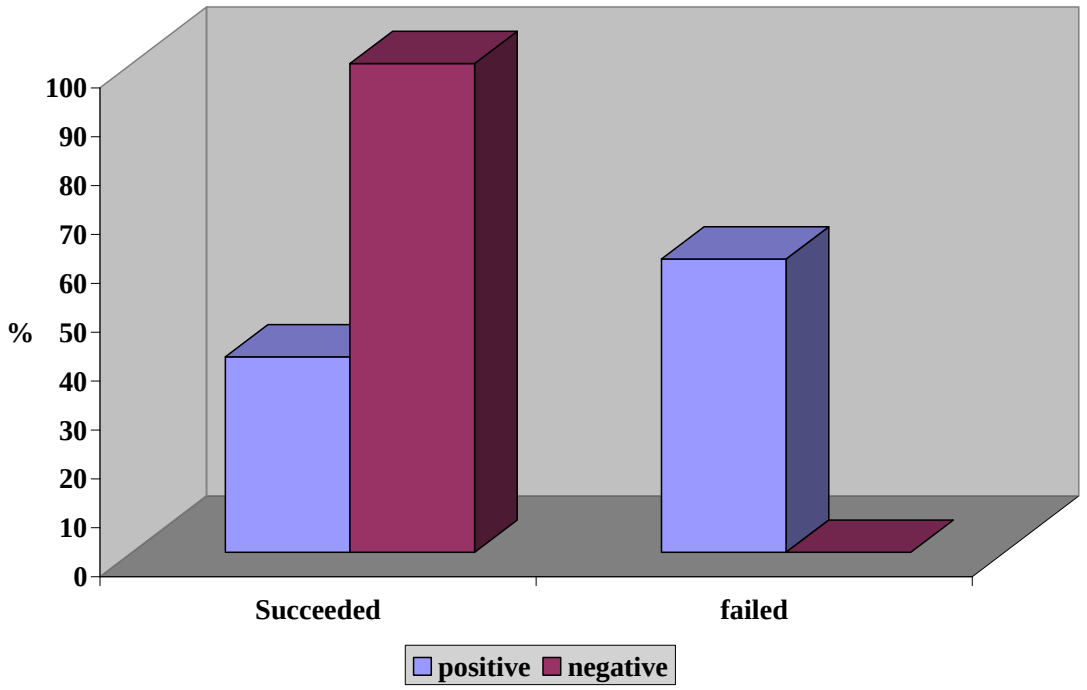

Table (11) shows the success rate among the 3 groups according to the graft material used in repair:

Success Group	succeeded		failed		Total	
	No	%	No	%	No	%
I	7	70.0	3	30.0	10	100.0
II	9	90.0	1	10.0	10	100.0
III	8	80.0	2	20.0	10	100.0
Total	24	80.0	6	20.0	30	100.0

Chi-square:- $\mathbf{X^2}$ = 1.25 **P** > 0.05

This table reveals the success rate among the 3 groups according to the graft material used in the repair:

In group I the success rate is 70%.

In group II the success rate is 90%.

In group III the success rate is 80%.

The difference in the success rate among the 3 groups is of no statistical significant value as **P** > 0.05.

Fig(36) Chart shows the success rate among the 3 groups according to the graft material used in repair:

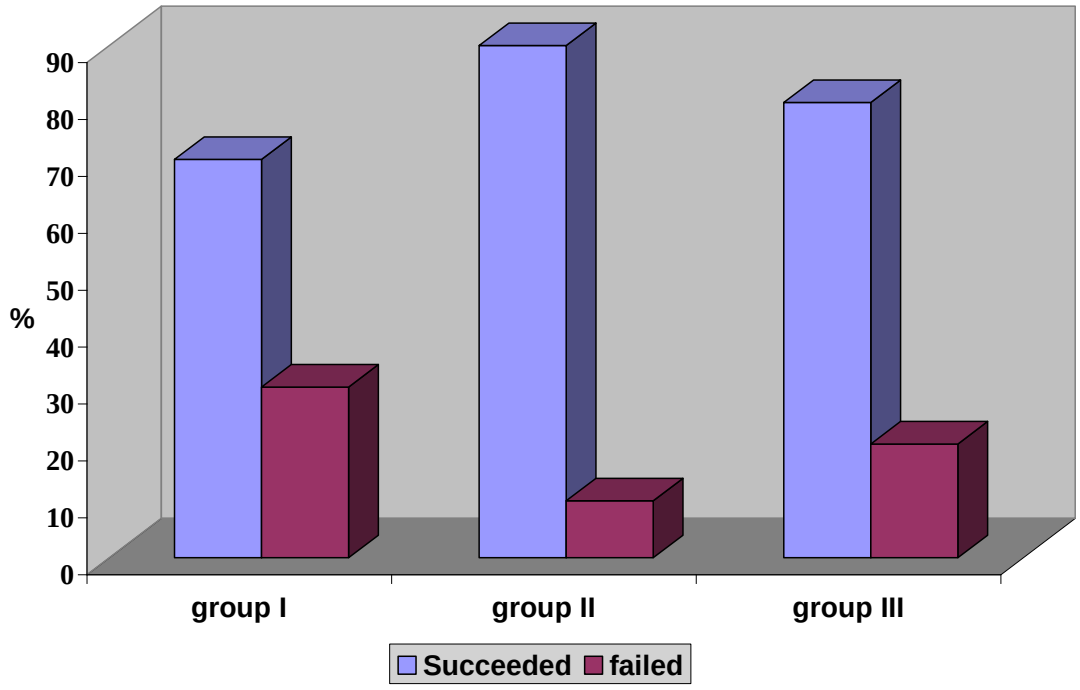

Table (12) shows postoperative complications:

Type	Number of cases	Time of occurrence	Management
Stenosis	- 2 cases of group I	- 2 weeks postoperatively	we tried to relieve this stenosis by repeated application of local pack soaked with antibiotic and steroid cream
	- 1 case of group II	- 3 weeks postoperatively	
Bleeding	- It was minimal in patients of group I and II	- 48 h. on removal of the anterior Vaseline nasal pack.	- Stopped with application ephedrine pack.
	- 2 cases of group III show massive bleeding	- 3 weeks post operatively with excision of the pedicle of the inferior turbinate	- Diathermy is needed for local heamostasis under local anesthesia.
Crusts	- minimal crusts in cases of group I and II	- In the first 2 weeks postoperatively	- Washed out using normal saline
	-large amounts of crusts in cases of group III	- Persist for 4 weeks postoperatively	- We were in need to remove the adherent crusts in every visit follow up.
Synachia	-2 cases of group III	-2 weeks postoperatively after excision of the pedicle of the inferior turbinate	-Release of synechia under local anesthesia and put a silastic splint and local pack soaked with antibiotic cream
Nasal obstruction	-3 cases of group III	- weeks postoperatively	-No management as any interference to reduce the bulky tissue of the inferior turbinate caries the risk of reperforation.