RESULTS

Our study was performed upon 30 patients of various types of glaucoma. The patients are divided into two groups, the first group (A) was formed of 15 patients in whom trabeculectomy was performed without mitomycin, and the second group (B) was formed of the other 15 patients in whom trabeculectomy was performed with mitomycin.

The follow up period of our patients was at regular interval post operatively at 1m, 3m and 6m.

Detailed statistical analysis of each of the measured parameters was done with comparing the values of the group (A) and (B) together. Different results are demonstrated in tables and illustrative graphs.

The data was statistically described in terms of range, mean, standard deviation (±SD), frequencies (number of cases) and relative frequencies (percentages) when appropriate. Comparison of quantitative variables between the 2 groups was done using Student t test. Chi square (x^2) test was performed. A probability value (P value) less than 0.05 was considered statistically significant. P value less than 0.001 was considered statistically highly significant. P value more than 0.05 was considered statistically non- significant. All statistical calculations were done using SPSS version 16 (Statistical Package for the Social Science; SPSS Inc., IL, USA) statistical program.

Some data of the study groups (A, B) was shown in table (3) (4)

Patient Data

Table (3)

Group "A" was composed of 15 cases, all of them had undergone trabeculectomy without mitomycin, some of the data of this group of patients are shown in table (3)

Case No.	Sex	Age	BCVA (pre→ post (6M)	IOP (mmHg) (pre→ post (6M)	Conjunctival Bleb	Notes
1	male	50	6/24→6/24	22→16	Flat bleb, avascular	(ACG)
2	female	49	5/60→5/60	24→14	Flat,diffuse bleb, avascular	(ACG)
3	male	73	6/60→6/36	50→27	Flat,vascularized bleb	(ACG)
4	male	39	6/24→6/18	23→17	High bleb,thin	(OAG)
5	male	60	1/60→1/60	25→17	Flat bleb,vascularized	(ACG)
6	female	40	1/60→1/60	27→21	encapsulated bleb	(ACG)
7	male	62	6/12→6/9	25→12	Flat, vascularized bleb	(OAG)
8	female	53	6/60→6/60	35→27	Encapsulated bleb	(OAG)
9	male	65	6/60→6/60	23→18	Flat,vascularized bleb	(ACG)
10	male	66	6/12→6/12	22→12	Flat ,vascularized	(OAG)
11	female	55	6/60→6/60	24→18	flat, vascularized bleb	(ACG)
12	female	68	1/60→1/60	25→22	Flat,vascularized bleb	(ACG)
13	female	50	1/60→6/60	40→22	Flat,vascularized	(ACG)
14	female	55	6/24→6/24	30→20	flat, diffuse bleb, avascular	(ACG)
15	female	55	6/36→6/24	27→20	Flat,diffuse bleb, avascular	(ACG)

Table (4)

Group "B" was composed of 15 cases, all of them had undergone trabeculectomy with mitomycin, some of the data of this group of patients are shown in table (4)

Case No.	Sex	Age	BCVA (pre→ post (6M)	IOP (mmHg) (pre→ post (6M)	Conjunctival Bleb	Notes
1	Female	60	6/18→6/24	25 →10	High,thin,diffuse bleb	(ACG)
2	female	60	1/60→1/60	24→11	High,thin diffuse bleb	(ACG)
3	female	40	6/36→5/60	24→6	High, Thin bleb	(ACG)
4	male	50	6/60→6/36	22→8	High,Thin, diffuse bleb	OAG)
5	female	55	3/60→3/60	30→20	Flat, thin, diffuse, avascular	Neovascular glaucoma
6	female	50	6/36→6/36	22→10	High,thin,diffuse bleb	(OAG)
7	female	31	6/18→6/24	24→10	High,thin,diffuse bleb	(OAG)
8	male	62	5/60→5/60	32→12	High,thin,diffuse bleb	(ACG)
9	male	42	3/60→3/60	30→16	Flat,thin, a vascular	(OAG)
10	male	48	6/60→5/60	25→14	High,thin,diffuse bleb	(OAG)
11	female	53	6/18→6/18	30→10	Polycystic,diffuse, thin bleb	(ACG)
12	male	55	6/18→6/9	25→12	High,thin,diffuse bleb	(OAG)
13	female	51	6/24→6/24	42→19	Flat,thin, a vascular bleb	(ACG)
14	female	60	6/36→6/36	25→19	Flat, avascular bleb	(ACG)
15	female	60	6/24→6/24	27→12	Flat, diffuse, avascular bleb	(ACG)

No statistically significant differences were found between the two groups (A) & (B) regarding the age & sex distribution so they are cross-matched groups i.e. similar and homogenous.

Sex distribution

Twelve patients were males (40.0%) while eighteen patients were females (60%) as shown in table (5)

Table (5): showing sex distribution of the studied groups:

Group / Gender	Group A (without mitomycin)		Group B (with mitomycin)		Total	
	No	**%**	**No**	**%**	**No**	**%**
Male	7	46.7	5	33.3	12	40.0
Female	8	53.3	10	66.7	18	60.0
Total	15	100.0	15	100.0	30	100.0

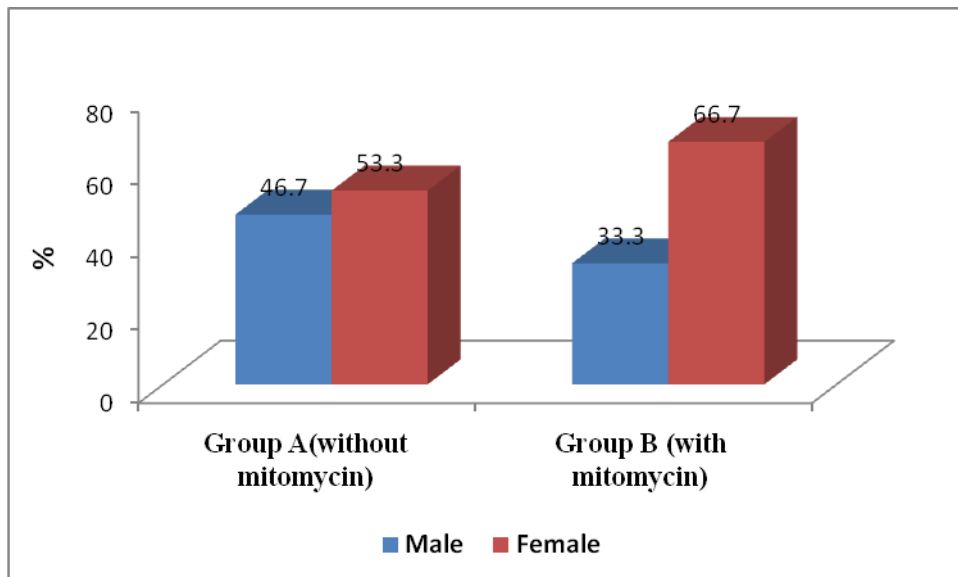**$X2 = 0.56$**   **$p > 0.05$**

Fig. (31): sex distribution of the study groups

Age distribution regarding the type of glaucoma

The age ranged from 39 to 73 years with a mean of 56 years (SD ± 9.8) in group (A) and ranged from 31- 62 years with a mean of 51.8 (SD ±8.8) in group (B) as shown in table (6) and (7)

Table (6): showing distribution of group A according to gender, age and type of glaucoma

Group	No	%	Male	Female	Age range(y)	Age (Mean±SD)
Angle closure	10	66.7	3	7	40-73	57±9.8
Open angle	5	33.3	4	1	39-66	54±10.6
Total	15	100.0	7	8	39-73	56±9.8

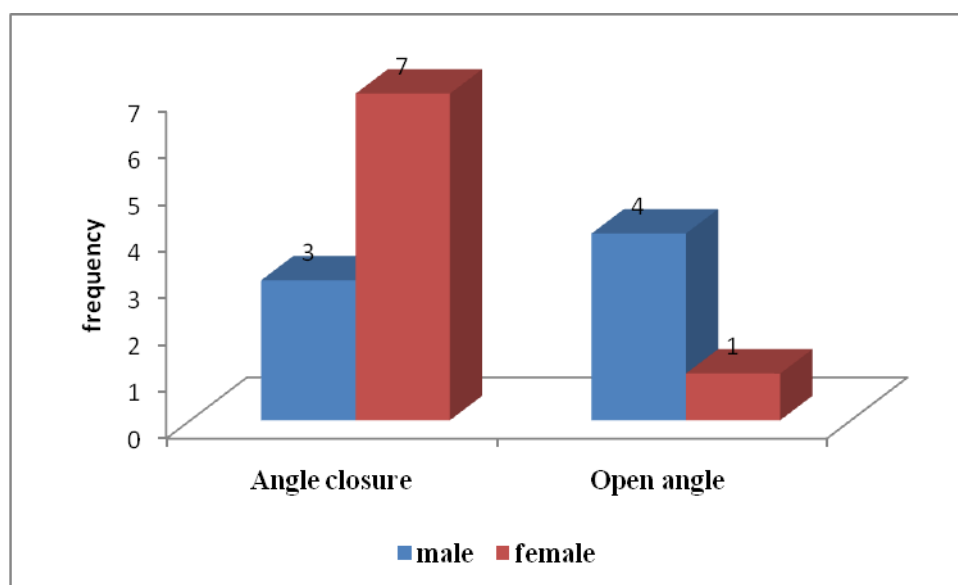

Fig. (32): showing distribution o group A according to gender and type of glaucoma

Table (7): Showing distribution of group B according to gender, age and type of glaucoma

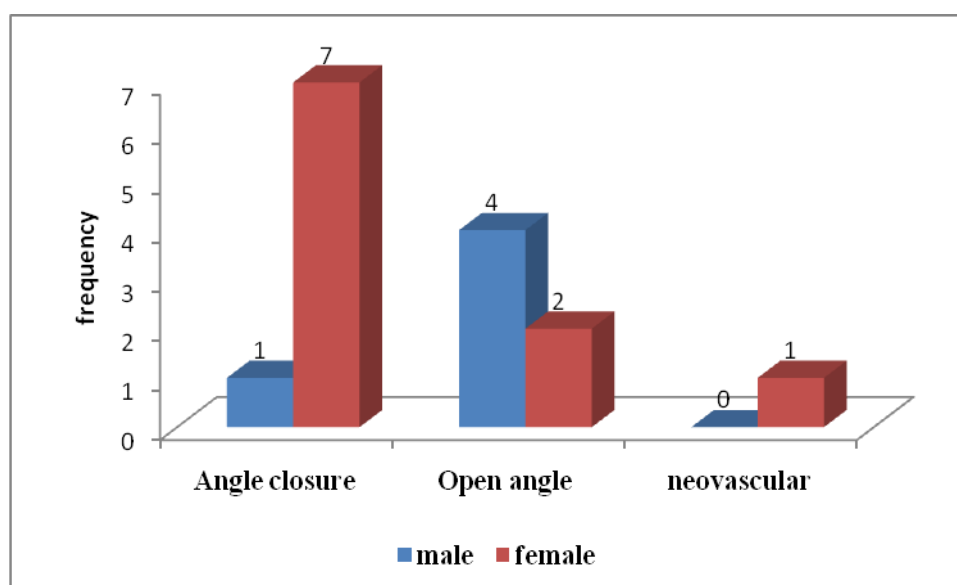| Group	No	%	Male	Female	Age range(y)	Age (Mean±SD)
Angle closure	8	53.3	1	7	40-62	55.75±7.5
Open angle	6	40.0	4	2	31-55	46±8.5
Neovascular	1	6.6	0	1	55	55±0
Total	15	100.0	5	10	31-62	51.8±8.8

Fig. (33): showing distribution o group A according to gender, and type of glaucoma

Regarding BCVA, there was no statistically significant difference between preoperative BCVA and post operative BCVF (P > 0.05) of the study groups A, B as seen in table (8), (9) & fig. (34), (35)

Table (8): Showing results of pre-operative BCVA of the study groups (A,B)

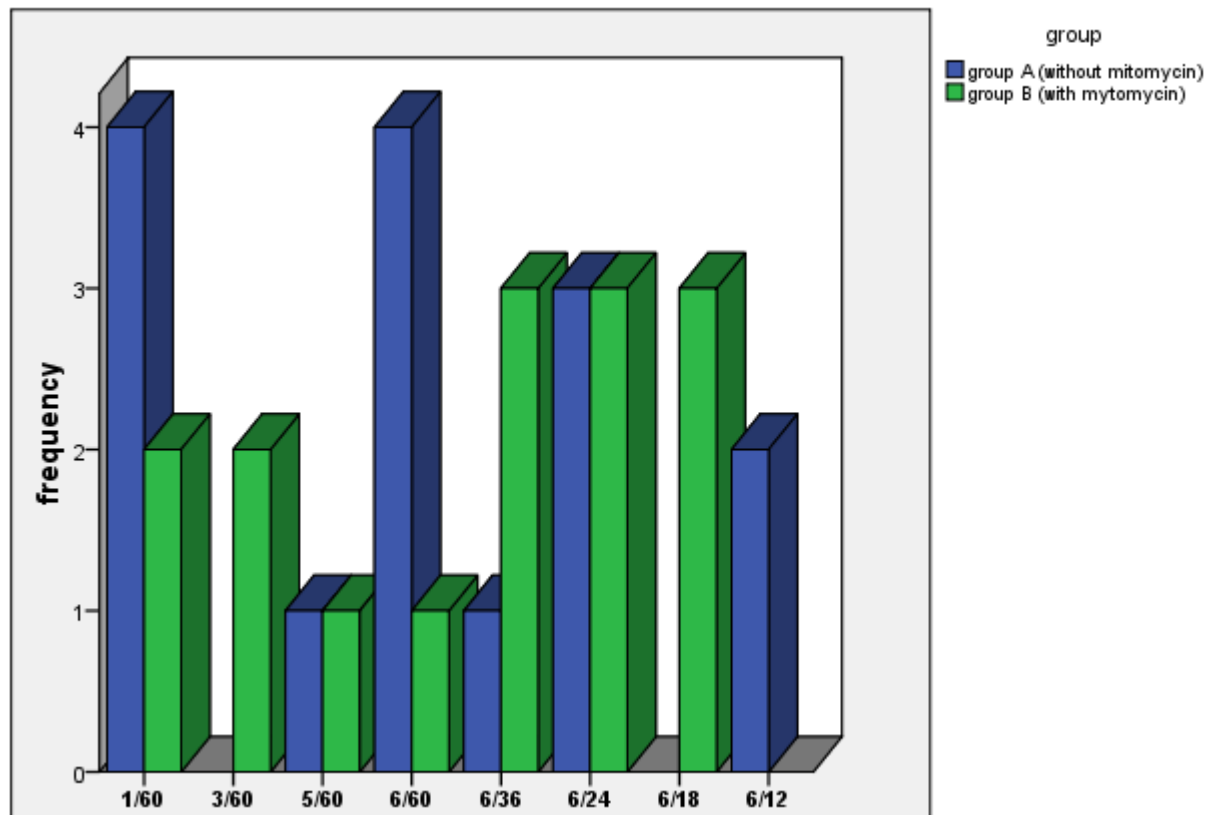| Pre- operative BCVA	Group (A)		Group (B)		X^2	P
	No.	%	No	%		
1/60	4	26.7	1	6.7		0.17
3/60	0	0.0	2	13.3		>0.05
5/60	1	6.7	1	6.7	10.5	
6/60	4	26.7	2	13.3		
6/36	1	6.7	3	20.0		
6/24	3	20.0	3	20.0		
6/18	0	0.0	3	20.0		
6/12	2	13.3	0	0.0		

Fig. (34): Showing pre- operative BCVA

Table (9): Showing results of post-operative BCVA of the study groups (A,B)

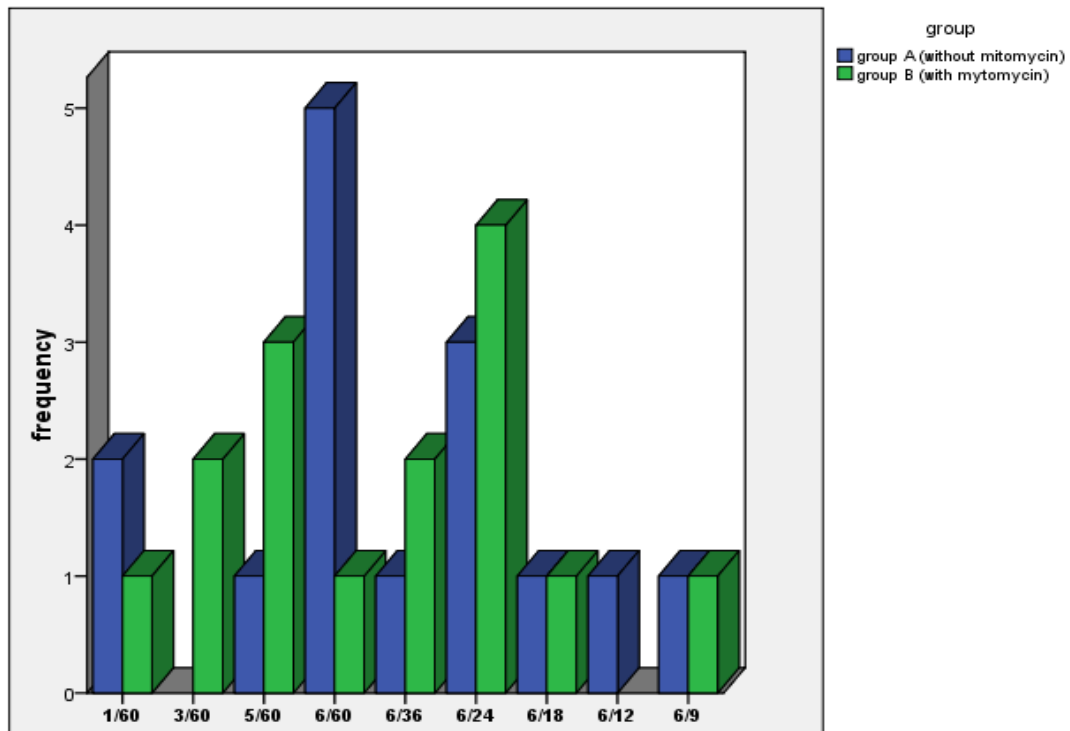| Post - operative BCVA	Group (A)		Group (B)		X^2	P
	No.	%	No	%		
1/60	2	13.3	1	6.7		
3/60	0	0.0	2	13.7		
5/60	1	6.7	3	20.0	7.47	0.48
6/60	5	33.3	1	6.7		>0.05
6/36	1	6.7	2	13.7		
6/24	3	20.0	4	26.7		
6/18	1	6.7	1	6.7		
6/12	1	6.7	0	0.0		
6/9	1	6.7	1	6.7		

Fig. (35): Showing post- operative BCVA

The evaluation of the functional and anatomical characteristics of the filtering blebs depends on the following values:

1- Intra ocular pressure and the use of any antiglaucoma medications

2- Bleb morphology.

3- Ultrasound biomicroscopy characteristics of the filtering blebs.

1- Intra ocular pressure

The mean pre operative IOP among the study groups was (28.1 ± 7.9) in group (A) with 50% of patients were on anti glaucoma medications (20% on 2 drugs, 30% on 1 drug) and (27.1 ±5.1) in group (B) with 60% of patients were on anti glaucoma medications (40% on 2 drugs and 20% on 1 drug) see table (10) and fig. (36).

Table (10): showing the mean and standard deviation of the pre-operative IOP among the study groups

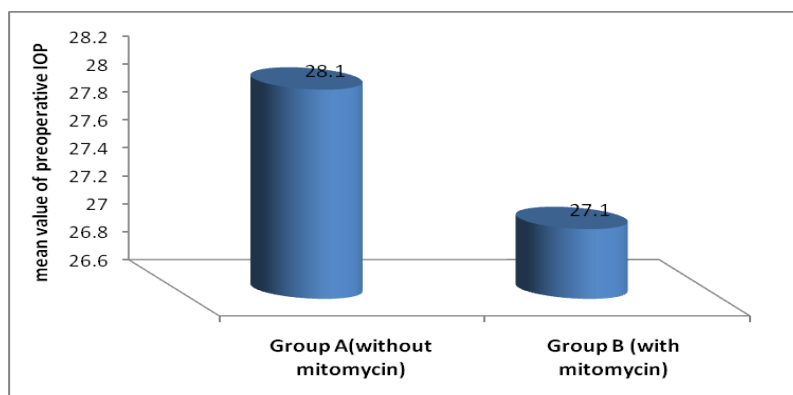| Parameter \ Group	Group A (n=15)			Group B (n=15)		
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)
Pre-operative IOP	28.1	7.9	22-50	27.1	5.1	22-42

Fig. (36): showing the mean deviation of the pre-operative IOP among the study groups

The success criteria of the postoperative intraocular pressure (IOP) was defined and classified as follows:

- *Complete success* was defined as an IOP reduction of >20% and/or an IOP constantly < 21 mm Hg without the need for antiglaucomatous medication.

- *Qualified success* was defined as an IOP < 21 mm Hg under topical antiglaucomatous medication.

- *Failed* when IOP >21 mm Hg despite topical antiglaucomatous therapy or the need for further surgical interventions were classified as failure *(Mandal et al., 2002).*

Table (11): Gives the intraocular pressure of the first group of patients with trabeculectomy without mitomycin group (A) during 1,3,6 months post operative.

case no.	1Month	3 Month	6 Month	treatment (post operative)	status
1	16 mmhg	16	16	no ttt	complete success
2	14mmhg	16	14	no ttt	complete success
3	20	30	27	on timolol maleate 0.5% bid,	failed
4	19mmhg	19	17	no ttt	complete success
5	22	22	17	on timolol maleate 0.5% bid,	qualified success
6	20 mmhg	25	21	on timolol maleate 0.5% bid,	qualified success
7	12 mmhg	12	12	no ttt	complete success
8	25	30	27	on levobunolol 0.5% bid,	failed
9	18 mmhg	21	18	on timolol maleate 0.5% bid,	qualified success
10	12 mmhg	12	12	no ttt	complete success
11	25	22	18	on timolol maleate 0.5% bid,	qualified success
12	20	28	22	dorzolamide 2%, latanoprost 0.005% once daily	failed
13	20	24	22	on timolol maleate 0.5% bid,	failed
14	25	27	20	on timolol maleate 0.5% bid,	qualified success
15	20 mmhg	20	20	on timolol maleate 0.5% bid,	qualified success

group A (without mitomycin) IOP (mmHg)

Table (12): Gives the intraocular pressure of the second group of patients with trabeculectomy with mitomycin group (B) during 1,3,6 months post operative.

group B (with mitomycin)

IOP (mmHg)

case no.	1 Month	3 Month	6 Marth	treatment (post operative)	status
1	10 mmhg	10	10	no ttt	complete success
2	11mmhg	11	11	no ttt	complete success
3	10mmhg	10	6	no ttt	complete success
4	10mmhg	10	8	no ttt	complete success
5	17mmhg	25	20	on timolol maleate 0.5% bid, dorzolomide 2% once daily	Qualified success
6	11mmhg	11	10	no ttt	complete success
7	10mmhg	10	10	no ttt	complete success
8	14mmhg	14	12	no ttt	complete success
9	20	26	16	on dorzolamide 2%, latanoprost 0.005% once daily	Qualified success
10	14mmhg	14	14	no ttt	Qualified success
11	10mmhg	10	10	no ttt	complete success
12	15mmhg	15	12	no ttt	Complete success
13	18	24	19	on timolol maleate 0.5% bid,	Qualified success
14	11mmhg	24	19	on timolol maleate 0.5% bid,	Qualified success
15	12	12	12	no ttt	complete success

- **Results of post-operative IOP among the studied groups over the follow up period**

  Regarding the post operative IOP, the mean post operative IOP of the group (A) & group (B) (1 month post operative) was 18.5 ± 4.3 mmHg and 13.3 ± 3.4 mmHg respectively (P = 0.001), 21.3 ± 6.2 and 15.5 ± 6.5 for group (A) & (B) (3 moth post operative) (P < 0.05) and 18.7 ± 4.8 mmHg , 12.9 ± 3.6 mmHg for group (A) & (B) (6 moth post operative) (P = 0.001) see table (13) and figure (37).

Table (13): showing the mean and standard deviation of post operative IOP of the study groups over the follow up period

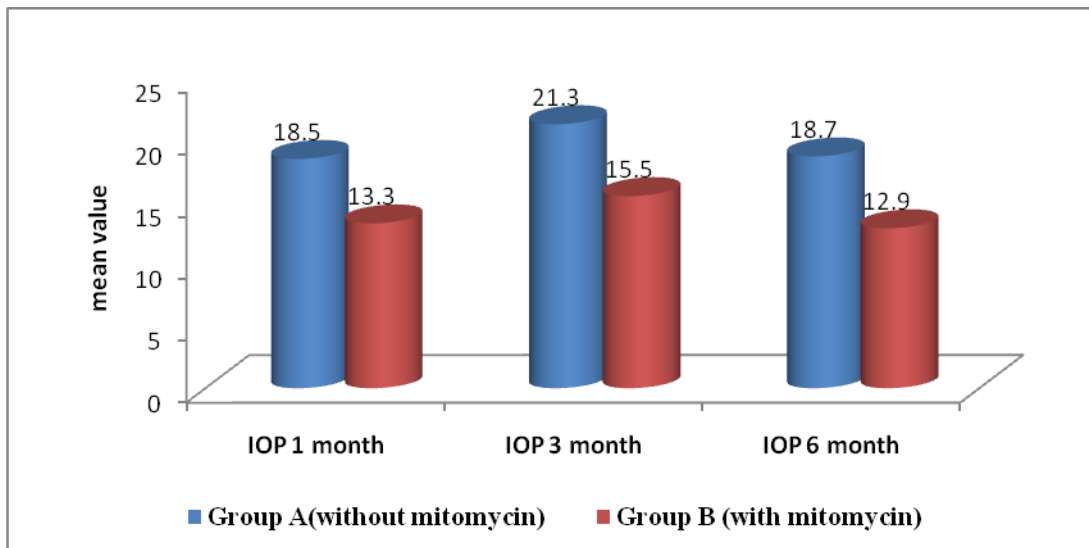| Group / Parameter (mmHg)	Group A (n=15)			Group B (n=15)			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (Min-Max.)			
IOP 1 month	18.5	4.3	12-25	13.3	3.4	10-20	3.7	0.001	2.3-8.1
IOP 3 month	21.3	6.2	12-30	15.5	6.2	10-26	2.6	<0.05	1.2-10.5
IOP 6 month	18.7	4.8	12-27	12.9	3.6	6-18	3.7	0.001	2.6-8.9

Fig. (37): showing the mean deviation of post-operative IOP of the study groups over the follow-up period

Regarding IOP control, 33.3% of group A achieve complete success while 73.3% of group B achieve that success at 6 months follow-up (P < 0.05), 40% of group A achieve qualified success with one anti glaucomatous drugs, while 26. 7% of group B achieve that success (50% of them with one drug and the other 50% with 2 drugs).

There was also about 26.7% of group A represent failure despite treatment whears no cases in group B represent failure in IOP control. See table (14) and figure (38).

Table (14): Showing comparison between the studied groups regarding success

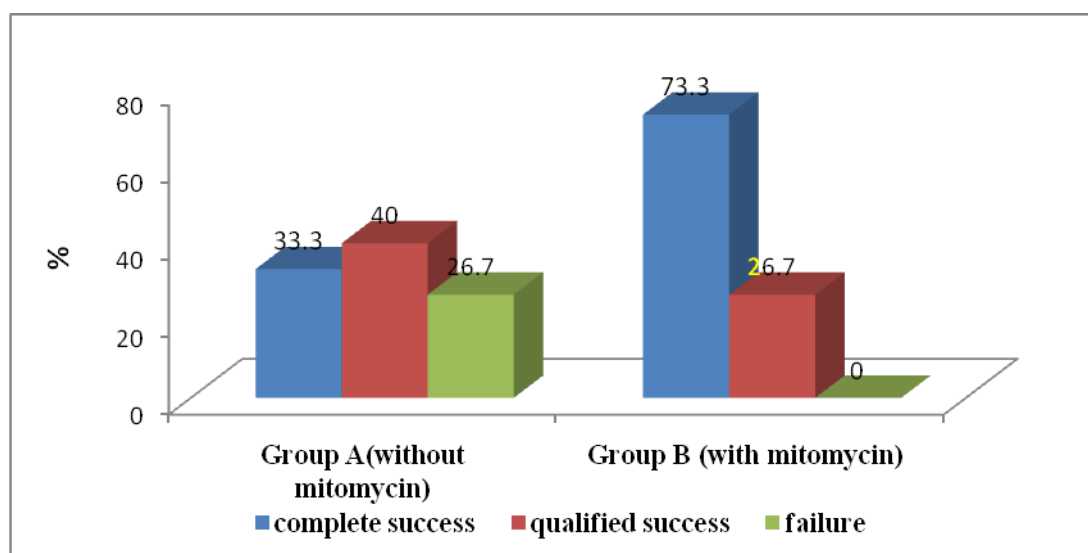| Success			group		Total	z	P
			group A (without mitomycin)	group B (with mytomycin)			
complete success	No.		5	11	15	-2.2	< 0.05
	% within group		33.3%	73.3%	50.0%		
qualified success	No.		6	4	11	0.34	>0.05
	% within group		40.0%	26.7%	36.7%		
	One drug		6, 100%	2 50%			
	2 drugs		0 , 0.0%	2 50%			
Failure	No.		4	0	4	2.15	<0.05
	% within group		26.7%	0.0%	13.3%		
	One drug		3, 75%	0, 0.0%			
	2 drugs		1, 25%	0, 0.0%			
Total	No.		15	15	30		
	% within group		100.0%	100.0%	100.0%		

Fig. (38): Showing comparison between the study groups regarding success

2- Bleb morphology:

Morphological classification of the filtering blebs

During the study, Colored photography of the filtering blebs was performed using a fundus camera. According to these photographs, four types of the filtering blebs had been found: *(Van Buskirk & Kronfeld, 1982)(Zhang et al., 2008).*

- **Type 1 bleb** has a thin, high and polycystic appearance due to a transconjunctival flow of aqueous and is associated with good filtration (Figure 40).

- **Type 2 bleb** is flat, thin and diffuse with a relatively avascular appearance in comparison with the surrounding conjunctiva and is associated with good filtration (figure 41).

- **Type 3 bleb** is flat; its surface contains engorged blood vessels. It is non- filtering bleb caused by subconjunctival fibrosis (Figure 42).

- **Encapsulated bleb** (Tenon's capsule cyst) is a localized, highly elevated, dome-shaped, firm, cyst like cavity of hypertrophied tenon's capsule with some engorged surface blood vessels susually non filtering (figure 43).

Results of bleb morphology of the study groups (A,B)

In cases performed with miomycin, 10 blebs (66.7%) tend to be morphologically of type 1 and 5 blebs (33.3%) were of type 2, while 8 blebs(53.3%) of cases performed without mitomycin tend to be morphologically of type 3, 4 blebs (26.7%) were of type 2, 2 blebs (13.3%) were of encapsulated type and 1 pleb (6.7%) was of type 1 as shown in table (15) and fig. (39).

Table (15): Showing results of bleb morphology of the study groups (A, B)

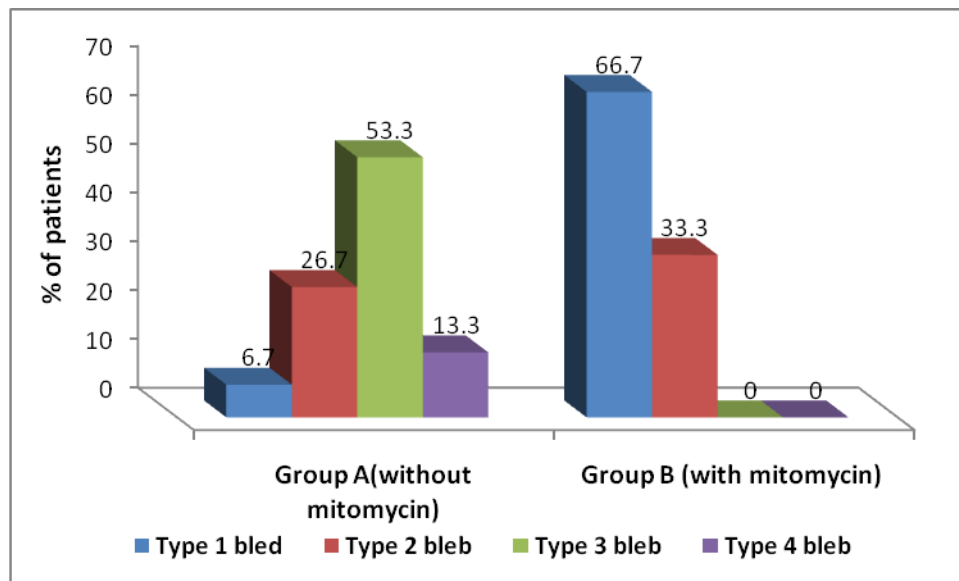| Bleb morphology	Group (A)		Group (B)		X^2	P
	No.	%	No	%		
Type 1 bleb (Polycystic bleb)	1	6.7%	10	66.7%	17.5	<0.001
Type 2 bleb (Flat, avascular)	4	26.7%	5	33.3%		
Type 3 bleb (Flat, vascularized)	8	53.3%	0	0%		
Encapsulated bleb	2	13.3%	0	0%		

Fig. (39): Showing results of bleb morphology of the study groups (A, B)
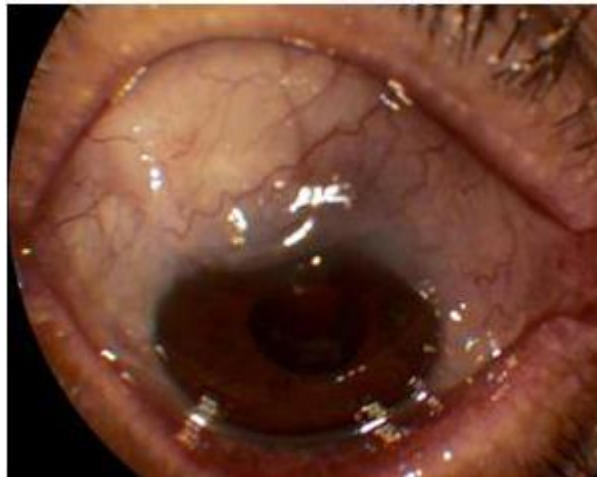
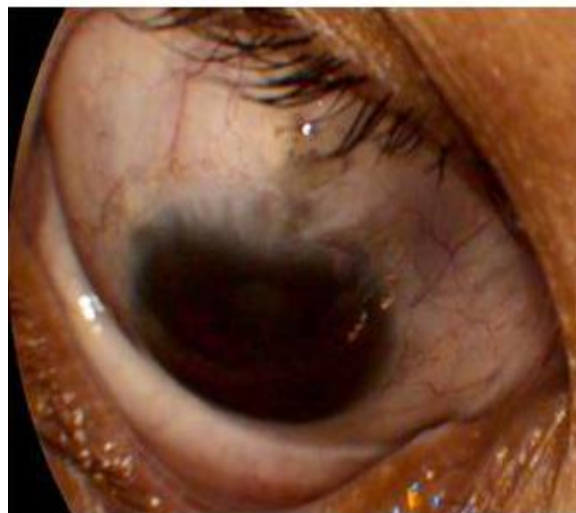**Fig. (40): Showing high, thin and diffuse bleb (type 1 bleb). (Case No. 2 group B)**

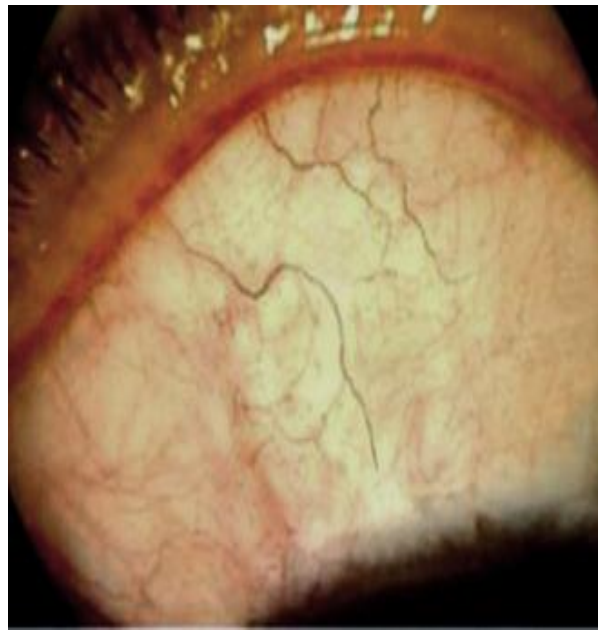**Fig. (41): Showing flat avascular bleb (type 2) bleb (Case No. 15 group B)**

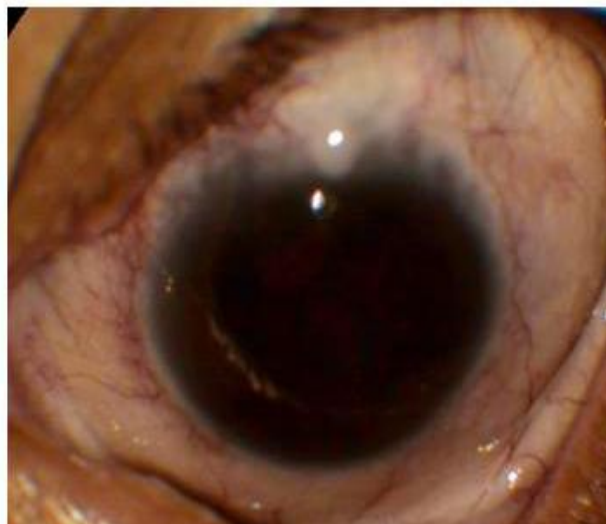**Fig. (42): Showing flat, vascularized (type 3 bleb) (Case No. 3 group A)**

Fig. (43): Showing encapsulated bleb (Case No. 8 group A)

3- Ultrasound biomicorscopic characteristics of the filtering blebs

The following parameters were assessed:

A- Reflectivity of the bleb.

B- Height of the bleb.

C- Breadth of the bleb.

D- Aqueous drainage route assessment.

A- Reflectivity of the bleb.

The reflectivity of the bleb was classified according to its similarity to the scleral reflectivity of the same ultrasound biomicroscopic image and standard intra bleb image for low reflectivity. The image was classified as having **low reflectivity** when it was isoechoic compared with that in the standard intra bleb image, of **medium reflectivity** when it was found to lie between the reflectivities of the standard image and the sclera and of **high reflectivity** when the reflectivity of a particular image was isoechoic or hyperechoic compared with that with that of the sclera demonstrated in the same ultrasound biomicroscopic image. see fig. (45), (46), (47).

Tables (16) and (17) give the reflectivity of the study groups over the follow-up period

- **Results of the bleb reflectivity over the follow- up period**

Regarding the bleb reflectivity, there was 33.3% of group A and 6.7% of group B had high reflectivity, 53.3% of group A and 33.3% of group B had medium reflectivity and 13.3% of group A and 60% of group B had low reflectivity during the follow up period (1,3 and 6 months) with $P < 0.05$ which is considered statistically significant. See table (18) figure (44).

Table (16): Gives the reflectivity within the bleb of the first group of patients with trabeculectomy without mitomycin group (A) over the follow-up period.

Group A (without mitomycin) reflectivty of the bleb			
case no.	1 Month	3 Month	6 Month
1	Medium	medium	medium
2	Medium	medium	medium
3	high	high	high
4	Medium	medium	medium
5	Medium	medium	medium
6	high	high	high
7	Medium	medium	medium
8	high	high	high
9	Low	low	low
10	Low	low	low
11	Medium	medium	medium
12	high	high	high
13	high	high	high
14	Medium	medium	medium
15	Medium	medium	medium

Table (17): Gives the reflectivity within the bleb of the second group of patients with trabeculectomy with mitomycin group (B) over the follow-up period.

Group B (with mitomycin) Reflectivty of the bleb			
case no.	1 month	3 month	6 month
1	Low	low	low
2	Low	low	low
3	Low	low	low
4	Medium	medium	medium
5	Medium	medium	medium
6	Medium	medium	medium
7	Low	low	low
8	Low	low	low
9	Low	low	low
10	Low	low	low
11	Low	low	low
12	Low	low	low
13	High	high	high
14	Medium	medium	medium
15	Medium	medium	medium

Table (18): Comparing the studied groups regarding reflectivity at the follow up period 1, 3 and 6 months.

		group		
		group A (without mitomycin)	group B (with mytomycin)	Total
high	No.	5	1	6
	% within group	33.3%	6.7%	20.0%
medium	No.	8	5	13
	% within group	53.3%	33.3%	43.3%
low	Count	2	9	11
	% within group	13.3%	60.0%	36.7%
Total	No.	15	15	30
	% within group	100.0%	100.0%	100.0%

Adjusted X^2 = 7.8   **P <0.05**
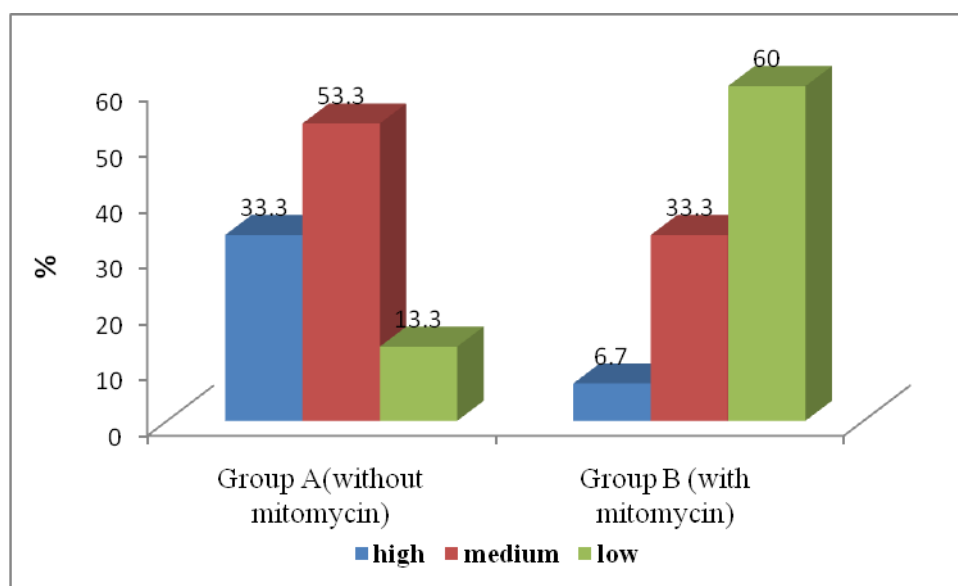
Fig. (44): showing reflectivity of the study groups over the follow-up period

Fig. (45): UBM image for low reflectivity. Case no 1 of the group (B) with mitomycin patient IOP = 10 mmHg without ttt

Fig. (46): UBM image for medium reflectivity. Case no 1 of the group (A) without mitomycin patient IOP = 16 mmHg without ttt

Fig. (47): UBM image for high reflectivity. Case no 3 of the group (A) without mitomycin patient IOP = 27 mmHg on timolol

(B) Height o the bleb

Bleb height was defined as the length of the longest line from the surface of the sclera to that of the bleb, measured perpendicular to the sclera.see fig. (49), (50)

Table (19 and 20) give the bleb height of the study groups (A) and (B) over the follow up period

- **Results of the bleb height over the follow- up period**

Regarding the bleb height, the mean height of the bleb (1 month follow up) of **group A** (N= 12) was 0.353 ± 0.216mm and 1.097 ± 0.593mm for **group B** (P < 0.001) which was considered statistically highly significant), see table (21) and fig. (48) it was 0.345 ± 0.208 for **group (A)** (N = 12) with 3 cases (20%) were poorly visible and 1.098 ± 0.578 mm for **group B** (N =15) (at 3 months follow up) (P = 0.001) which is statically significant. See table (22) and fig (48).

It was also 0.353 ± 0.227 mm for **group A** (N = 12) with 3 cases (20%) were poorly visible, 1.126 ± 0.6 11mm for **group B** (N = 15) (at 6 months follow up). (P < 0.01) which is statistically significant. See table (23) and fig. (48).

The height of one case (8.33%) of **group (A)** and 13 cases (86.66%) of **group (B)** ranging between (> 1 mm - > 0.5mm). and 11 cases (91.66%) of **group (A),** 2 cases (13.33%) of **group (B)** were (< 0.5 mm) see table (35), (36).

Table (19): Gives the bleb height of the first group of patients with trabeculectomy without mitomycin group (A) over the follow up period

group A (without mitomycin) height of the bleb (mm)			
case no.	1 month	3 Month	6 Month
1	0.207	0.207	0.207
2	0.368	0.368	0.368
3	poorly visible		
4	0.921	0.921	0.940
5	0.323	0.323	0.240
6	0.454	0.454	0.484
7	0.333	0.333	0.333
8	poorly visible		
9	0.275	0.275	0.266
10	0.376	0.322	0.322
11	0.287	0.287	0.287
12	poorly visible		
13	0.121	0.116	0.120
14	0.211	0.200	0.211
15	0.435	0.435	0.435

Table (20): Gives the bleb height of the first group of patients with trabeculectomy without mitomycin group (B) over the follow up period

group B (with mitomycin) height of the bleb (mm)			
case no.	1 Month	3 Month	6 Month
1	0.593	0.593	0.590
2	0.628	0.628	0.628
3	0.454	0.454	0.450
4	0.625	0.625	0.622
5	0.567	0.567	0.567
6	1.053	1.053	1.053
7	1.588	1.588	1.580
8	2.090	2.090	2.090
9	1.953	1.953	1.953
10	0.880	0.880	0.880
11	1.494	1.494	1.490
12	1.456	1.456	1.450
13	1.235	1.235	1.230
14	0.174	0.170	0.174
15	0.914	0.914	0.910

Table (21): Showing the bleb height among the studied groups at 1 month

Group / Parameter (mm)	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Height of bleb 1 month	0.335	0.216	0.121-0.921	1.097	0.593	0.174 -2.090	-4.7	<0.001	0.43-1.1

*→3 cases were poorly visible

Table (22): Showing the bleb height among the studied groups at 3 months.

Group / Parameter (mm)	Group A (N=12)*			Group B (n=15)			St."t" test	P	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Height of bleb 3 month	0.345	0.208	0.158-0.921	1.098	.5780	0.454 -2.090	-4.1	0.001	0.42-1.1

*→3 cases were poorly visible

Table (23): Showing the bleb height among the studied groups at 6 months.

Group / Parameter (mm)	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Height of bleb 6 month	0.353	0.227	0.207-0.940	1.126	٠.6110	0.450-2.090	-3.9	<0.01	0.32-1.2

*→3 cases were poorly visible
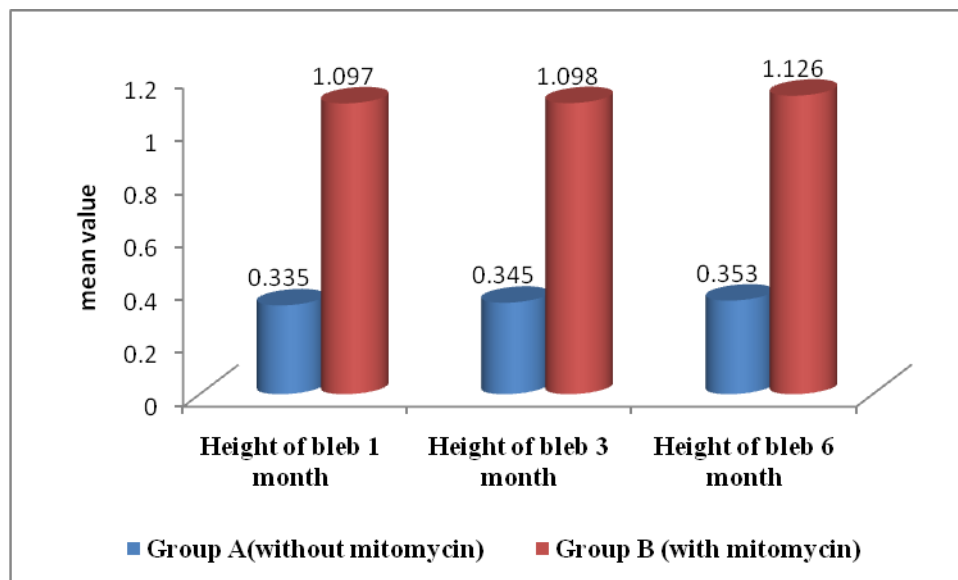

Fig. (48): Showing height of the bleb among the study groups over the follow- up period

Fig. (49): showing measurement of the bleb height in case no. 1 group (A). Height of the bleb = 0.207 mm. patient IOP = 16 mmHg without ttt

Fig. (50): showing measurement of the bleb height in case no. 6 group (B).

Height of the bleb = 1.053 mm patient IOP = 10 mmHg without ttt

(c) Breadth of the bleb

The transverse diameter of the bleb (**breadth**) is defined as the longest line, which is perpendicular to that which is used for measurement of the bleb height. This line connects a point, which is the beginning of the conjunctival bleb at the corneal side to a point where the conjunctival bleb ends at the scleral side. See fig. (52), (53), (54).

Tables (24 and 25) give the breadth of the bleb of the study groups (A) & (B) over the follow up period

- **Results of the breadth of the bleb over the follow up period**

  Regarding the breadth of the bleb, the mean breadth of the bleb of **group A** (N= 12) was 1.598 ± 0.557 mm and 2.677 ± 0.075 mm for **group B** (1 month follow up) (P < 0.001) which is statistically highly significant see table (26) and Fig. (51).

  It was 1.841 ± 0.528 mm for **group A** (n=12) with 3 cases (20%) were poorly visible, 2.436 ± 0.624 mm for **group (B)** (n = 15) (3 months follow up) (P < 0.05) see table (27) and Fig. (51).

  It also was 1.771 ± 0.553 mm for **group A** (n = 12 with 3 cases (20%) were poorly visible) and 2.475 ± 0.618 mm for **group (B)** (n = 15) (6 months follow up) (P = 0.01) see table (28) and figure (51).

  The breadth of 4 cases (33.3%) of group (A) and 11 cases (73.33%) of group (B) was > 2 mm and 8 cases (66.7%) of group A and 4 cases (26.6%) of group B was < 2mm. see table (35), (36).

Table (24): showing the breadth of the bleb of group (A) over the follow up period

group A (without mitomycin) Breadth of the bleb (mm)			
case no.	1 Month	3 Month	6 Month
1	1.788	1.780	1.788
2	2.505	2.505	2.505
3	poorly visible		
4	1.877	1.877	1.877
5	1.040	1.042	1.042
6	2.471	2.450	2.461
7	1.098	1.098	1.098
8	poorly visible		
9	1.785	1.785	1.785
10	2.503	2.503	2.503
11	2.363	2.360	2.360
12	poorly visible		
13	1.216	1.211	1.220
14	1.264	1.264	1.280
15	1.979	1.979	1.979

Table (25): Showing the breadth of the bleb of group (B) over the follow up period

group B (with mitomycin) Breadth of the bleb (mm)			
case no.	1 Month	3 Month	6 Month
1	1.814	1.811	1.817
2	2.778	2.775	2.771
3	2.140	2.114	2.110
4	2.765	2.765	2.761
5	3.016	3.011	3.011
6	2.417	2.417	2.417
7	2.850	2.850	2.851
8	2.616	2.616	2.616
9	2.675	2.650	2.630
10	2.851	1.850	1.800
11	3.528	3.501	3.501
12	3.605	3.501	3.501
13	2.406	2.406	2.406
14	1.647	1.647	1.647
15	1.609	1.609	1.609

Table (26): Showing bleb breadth among the studied groups at 1 month

Group / Parameter (mm)	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Breadth of bleb 1 month	1.598	0.557	1.023-2.505	2.677	٠.6750	1.609-3.806	-4.8	<0.001	0.62-1.5

* 3 cases were poorly visible

Table (27): Showing bleb breadth among the studied groups at 3 months

Group / Parameter	Group A (n=12)*			Group B (n=15)			St. "t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Breadth of bleb 3 month	1.841	0.528	1.042-2.505	2.436	0.624	1.609-3.806	-2.4	<0.05	0.08-1.1

* 3 cases were poorly visible

Table (28): Showing bleb breadth among the studied groups at 6 months

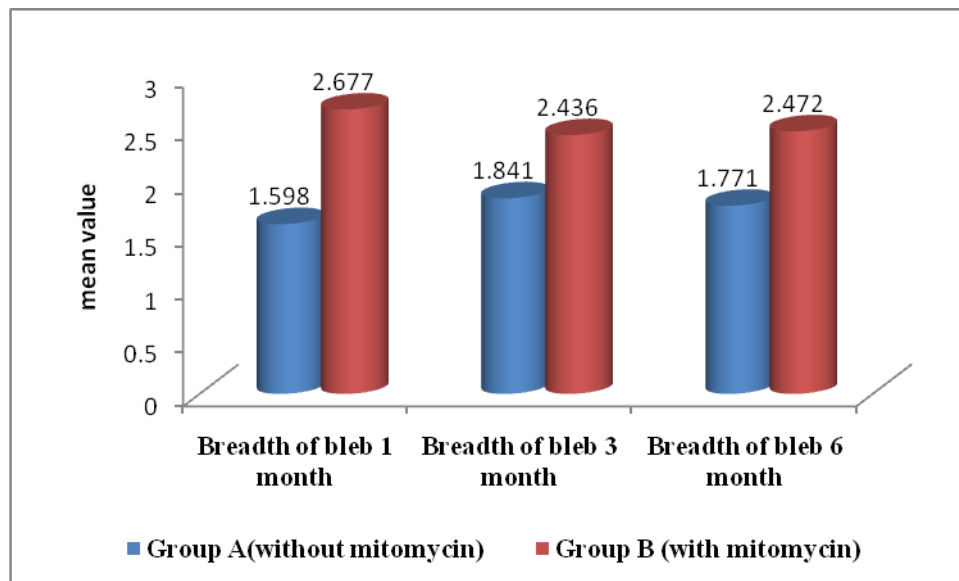| Group / Parameter	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Breadth of bleb 6 month	1.771	0.553	1.042-2.505	2.472	0.618	1.647-3.806	-2.8	0.01	0.18-1.2

* 3 cases were poorly visible

Fig. (51): Showing breadth of the bleb among the study groups over the follow up period

Fig. (52): Showing measurement of the bleb breadth in case no. 6 group (B). Breadth of the bleb = 2.417 mm. patients IOP = 10mmHg without ttt

Fig. (53): Showing measurement of the bleb breadth in case no. 1 group (A). Breadth of the bleb = 1.788 mm patients IOP = 16mmHg without ttt

(D) Aqueous drainge route assessment

The ultrasound biomicroscopic images evaluated for **visibility of the aqueous drainage route.** If the route could be identified and followed along the entire scleral flap, the route was classified as visible and measured in all cases in mm, and if it couldn't be identified along the entire scleral flap nor measured, it was classified as non or poorly visible. See fig. (56), (57), (58), (59).

In relation to drainage route visibility, group A showed (20%) of cases of poorly visible route in relation to group B whereas no poorly visible cases were detected.

Tables (29) (30) give measurement of the aqueous drainge route of the study groups (A & B).

- **Results of the aqueous drainage route assessment among the study groups over the follow up period**

  Regarding aqueous drainage route assessment, the mean deviation of **group A** (N = 12) was 0.634 ± 0.268 mm and 0.694 ± 0.319 mm for **group B** (1 month follow up) (p >0.05) (see table 31 and Fig. 55), it was 0.668 ± 0.153mm for **group (A)** (N = 12) with 3 cases (20%) were poorly visible and 0.740 ± 0.309 mm (N = 15) (3 months follow up) (p > 0.05) see table (32 and Fig. 55).

  It also was 0.726 ± 0.257 mm for **group A,** (N = 12) with 3 cases (20%) were poorly visible and 0.782 ± 0.326 mm for **group (B)** (N = 15) 6 month FU) (P > 0.05) (see table 33) and Fig. (55).

  The aqueous drainage route of 10 cases (83.33%) of **group (A)** and 11 cases (73.33%) of **group (B)** ranging between (> 1m - > 0.5 mm) and 2 cases (16.66%) of **group (A)** and 4 cases (26.6%) of **group (B)** was (< 0.5 mm). see table (35), (36).

Table (29): Gives the measurement of the aqueous drainage route within the bleb of the first group (A) over the follow-up period

Group A (without mitomycin) Aqueous drainge route assessment (mm)		
case no.	1 Month	3 Month	6 Month
1	0.623	0.621	0.620
2	0.607	0.607	0.607
3	poorly visible		
4	0.977	970	0.970
5	0.508	0.508	0.520
6	0.839	0.600	0.611
7	1.630	1.630	1.610
8	poorly visible		
9	0.555	0.551	0.550
10	0.718	0.712	0.710
11	0.525	0.525	0.525
12	poorly visible		
13	0.216	0.210	0.210
14	0.326	0.300	0.320
15	0.866	0.862	0.862

Table (30): Gives the measurement of the aqueous drainage route within the bleb of the first group (B) over the follow-up period

Group B (with mitomycin) Aqueous drainge route assessment (mm)		
case no.	1 Month	3 Month	6 Month
1	0.923	923	0.911
2	0.701	0.701	0.701
3	1.083	1.081	1.083
4	1.383	1.383	1.383
5	0.210	0.190	0.190
6	0.762	0.762	0.762
7	0.955	0.950	0.951
8	0.602	0.602	0.605
9	0.913	0.912	0.911
10	0.422	0.401	0.401
11	0.567	0.561	0.561
12	0.614	0.614	0.614
13	0.320	0.320	0.320
14	0.310	0.310	0.310
15	0.652	0.650	0.650

Table (31): Showing aqueous drainage route assessment among the studied groups at 1 month

Group / Parameter (mm)	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	**±SD**	**Range (min.-max.)**	**Mean**	**±SD**	**Range (min.-max.)**			
Aqueous drainage route assessment at 1 month	0.634	0..268	0.216-1.326	0.694	0.319	0.210-1.383	-0.56	>0.05	-0.28-0.16

*→3 cases were poorly visible

Table (32): Showing aqueous drainage route assessment among the studied groups at 3 mon**th**

Group / Parameter (mm)	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	**±SD**	**Range (min.-max.)**	**Mean**	**±SD**	**Range (min.-max.)**			
Aqueous drainage route assessment at 3 month	0.668	0.153	0.525-0.970	0.740	0.309	0.320-1.383	-0.64	>0.05	-0.31-0.17

*→3 cases were poorly visible

Table (33): showing aqueous drainage route assessment among the studied groups at 6 month

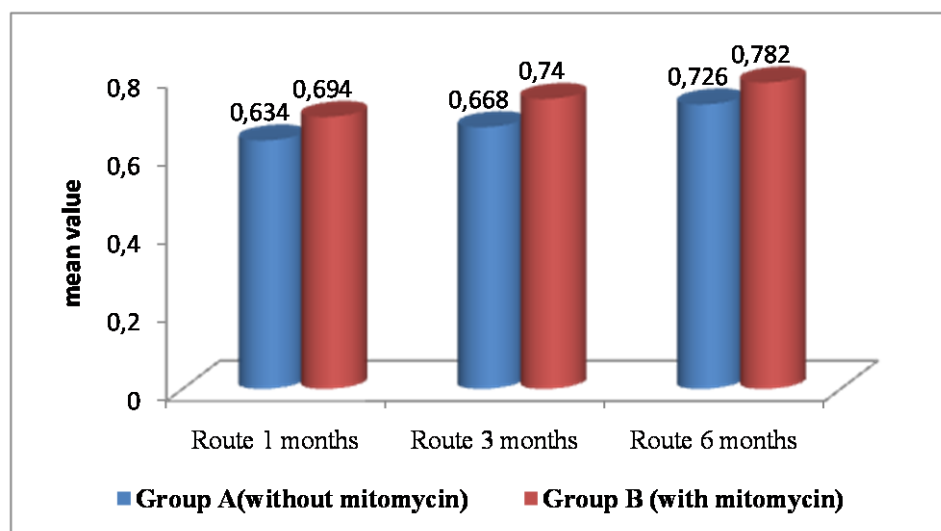| Group Parameter (mm)	Group A (n=12)*			Group B (n=15)			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
Aqueous drainage route assessment at 6 month	0.726	0.257	0.541-1.320	0.782	0.326	0.320-1.383	-0.41	>0.05	-0.34-0.23

*→3 cases were poorly visible

Fig. (54): Showing the aqueous drainage route assessment of the study groups over the follow up period

Fig. (55): Showing a visible aqueous drainage route beneath the scleral flap of case no. 6 of group B= 0.762 mm patient IOP = 10mmHg without ttt

Fig. (56): Showing a visible aqueous drainage route of case no. 4 of group B

= 1.383mm patient IOP = 8 mmHg without ttt

Fig. (57): Showing anon visible aqueous drainage route of case no. 8 of group A
patient IOP = 27 mmHg on levobunolol 0.5%

Table (34): Showing comparison between IOP (mmhg) and the four parameters of UBM at 6 months post operative

Parameter \ Group	Group A			Group B			St."t" test	p	95% CI
	Mean	±SD	Range (min.-max.)	Mean	±SD	Range (min.-max.)			
IOP 6 month (mmHg)	18.7	4.8	12-27	12.9	3.6	6-18	3.7	0.001	2.6-8.9
Reflectivity 6 m. High	5	33.3%		1	6.7%			< 0.05	
Middle	8	53.3%		5	33.3%			< 0.05	
Low	2	13.3%		9	60%		-1.51	< 0.05	
Height of bleb 6 month (mm)	0.353	0.227	0.207-0.940	1.126	0.611	0.450-2.090	-3.9	<0.01	0.32-1.2
Breadth of bleb 6 month (mm)	1.771	0.553	1.042-2.505	2.472	0.618	1.647-3.806	-2.8	0.01	0.18-1.2
Aqueous drainage route assessment 6 month (mm)	0.726	0.257	0.541-1.320	0.782	0.326	0.320-1.383	-0.41	> 0.05	-0.34-0.23

Table (35): Showing correlation of Iop in relation to morphology and UBM assessment of group (A):-

UBM parameters	No. of cases	Mean Iop (6M)	Bleb morphology
1) Bleb Reflectivity			
- High	5 (33.3%)	24 mm Hg	2(flat, vascularized), 2(encapsulated) 1 (flat a vascular)
- Medium	8 (53.3%)	17 mm Hg	1(polycystic), 4(flat a vascular), (3 flat vascularized)
- Low	2 (13.3%)	15 mm Hg	2(flat vascularized)
2) Height			
- > 1mm	0 (0%)	-	-
- < 1mm	1 (8.33%)	17 mm Hg	(High, polycystic)
- < 0.5 mm	11 (91.66%)	19 mm Hg	1(polycystic), 1 (encapsulated), 4 (flat, a vascular), 5(flat, vascularized).
3) Breadth.			
- > 2mm	4 (33.3%)	16 mm Hg	1(encapsulated), 3(flat, a vascular)
- < 2 mm	8 (66.7%)	27 mm Hg	3(flat, a vascular), 4 flat, vascularized), 1(polycystic).
4) Route. Assessment			
- > 1 mm	1 (8.3%)	12mm Hg	(Flat, vascularized)
- < 1 mm	9 (75%)	11mm Hg	5 (flat, vascularized), 1 (polycystic), 1 (encapsulated), 2 (flat, a vascular),
- < 0.5mm	2 (16.7%)	21mmHg	1 (flat, a vascular) 1 (flat, vascularized)

Table (36): Showing correlation of Iop in relation to morphological and UBM assessment of group (B).

UBM parameters	No. of cases	Mean Iop (6M)	Bleb morphology
1) Bleb Reflectivity			
- High	1 (6.7%)	19 mm Hg	Flat. a vascular
- Medium	5 (33.3%)	14 mm Hg	2 (polycystic) 3 (flat, a vascular)
- Low	9 (60%)	11 mm Hg	8 (polycystic) 1 (flat, a vascular)
2) Height			
- > 1mm	7 (46.66%)	12 mm Hg	4 (polycystic), 3 (flat, a vascular)
- < 1mm	6 (40%)	12.5 mm Hg	4 (polycystic), 2 (flat, a vascular)
- < 0.5 mm	2 (13.33%)	12.5 mm Hg	1 (polycystic), 1 (flat, a vascular)
3) Breadth.			
- > 2mm	11 (73.33%)	12 mm Hg	8 (polycystic), 3 (flat, a vascular)
- < 2 mm	4 (26.6%)	14 mm Hg	2 (polycystic), 2 (flat, a vascular)
4) Route assessment			
- > 1 mm	2 (13.33%)	7mm Hg	2 (polycystic)
- < 1 mm	9 (60%)	11mm Hg	7 (polycystic), 2 (flat, a vascular)
- < 0.5mm	4 (26.6%)	18mm Hg	1 (polycystic), 3 (flat, a vascular)

Regarding postoperative complications, the most frequent encountered delayed complications was cataract development in 9 cases (60%) in group (B) in comparison to group (A) 5 cases (33.3%) (at 6 months follow-up), the second common encountered problem was hypotony (IOP less than or equal to 6 mmHg) which occurred in 1case (6.6%) of group (B), where no cases were found in group (A). Hypotony maculopathy was found in the hypotonous case with decrease in visual acuity. There were no encountered cass with endophthalmitis.

<u>Statistical analysis</u>

The collected data were tabulated and analyzed using SPSS version 17 soft ware. Categorical data were presented as number and percentages while quantitative continous data were expressed as mean ± standard deviation and range. Chi square test (X^2), "Z" and student "t" tests were used as tests of significance. The accepted level of significance in this work was stated at 0.05 (P <0.05 was considered significant).

P value >0.05 insignificant

P<0.05 significant

P<0.01 highly significant

P<0.001 highly significant

<u>Mean =</u>

Is the sum of the values in a set of data divided by the number of the values in the set. It is denoted by the sign X (called X bar).

$$X = \frac{\sum X}{n}$$

Where: *X*   denotes any value of observation.

Σ *the Greek capital letter sigma, means the sum of.*

n   *The number of observations.*

Standard deviation (SD):

It is the positive square root of the variance.

Variance = S^2

The sum of the squares of the deviation of each measurement in a series from the mean of the series, divided by the total number of the observation minus one. (The degree of freedom).

$$S^2 = \frac{\sum \text{Squared deviation of the mean}}{n-1}$$

$$S^2 = \frac{\sum (X - \bar{X})^2}{n-1}$$

Chi square test
$$X^2 = \frac{\sum (O-E)^2}{E}$$

Where   O is the observed value

E is the expected value

It compares between 2 or more categorical groups (tables 2x2 or more)

"Z" test= is a test of significance that compares between 2 proportions.

$$Z = \frac{p_1 - p_2}{\sqrt{\dfrac{p_1 q_1}{n_1} + \dfrac{p_2 q_2}{n_2}}}$$

Where p_1 is the proportion 1 with the condition P_2 is the proportion 2 with the condition

q_1 proportion of group 1 without the condition

q_2 proportion of group 2 without the condition

n_1 = sample size of group 1

n_2 = = sample size of group 2

Student "t" test compares between 2 means of 2 independent groups.

t-value is the ratio of the difference between the two means/calculated SD of this difference.

$$t = \frac{\overline{X}1 - \overline{X}_2}{\sqrt{\dfrac{SD_1{}^2}{n_1} + \dfrac{SD_2{}^2}{n_2}}}$$

Where X_1 = mean of group 1

X_2 = mean of group 2

SD_1 = Standard deviation of group 1

SD_2 = Standard deviation of group 2

n_1 = sample size of group 1

n_2 = sample size of group 2

95% CI→ it is the interval at which the researcher is 95% confident that the the difference between the 2 population means lies