

## **PROGNOSIS OF FILTERING OPERATIONS AFTER PHACOEMULSIFICATION**

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### **Abstract:**

#### **Purpose:**

To evaluate the incidence of failure of filtering blebs after uneventful cataract extraction with phacoemulsification.

#### **Methods:**

35 cases of cataract with successful functioning filtering blebs and controlled intraocular pressure entered in this study. All of them had uneventful phacoemulsification cataract removal through corneal incisions away from the bleb site. Intraocular pressure and shape of the bleb were evaluated postoperatively.

#### **Results:**

24 cases continued with nearly the same preoperative intraocular pressure levels and the same size and shape of the bleb, 8 cases had mild changes in the shape of their blebs, but intraocular pressure still controlled; 3 cases had bleb failure and needed medication for intraocular pressure control.

#### **Conclusion:**

Phacoemulsification has minimal effect in the long term mean IOP and the morphology of the filtering bleb, but there is more than 8% incidence of failure of the bleb function after a follow up period of six months.

#### **Introduction:**

Intraocular surgical procedures in general and filtering surgery in particular, predispose to cataract formation or accelerate pre-existing lens opacification<sup>1,2</sup> thus the management of a visually significant cataract in a glaucoma patient who has had a previous trabeculectomy is a common clinical challenge, with the possibility that the intraocular surgery might result in filtration failure and loss of intraocular pressure (IOP) control. Previous studies reported that 10% to 38% of eyes with previous trabeculectomy require additional medication or further glaucoma surgery to maintain IOP control after extra capsular cataract extraction (ECCE) with intraocular lens implantation<sup>3</sup>.

Few studies compared the effect of phacoemulsification and (ECCE) on IOP control after cataract surgery and all of them reported a better control of IOP after

phacoemulsification, but the incidence of filtration failure after phacoemulsification is not clear from the literature.<sup>4,5,6</sup>

The purpose of this study is to evaluate the incidence of failure of filtering blebs after uneventful cataract extraction using phacoemulsification.

### **Patients and methods**

In this retrospective study the records of all patients with primary open angle glaucoma who had successful trabeculectomy and who subsequently had uneventful cataract surgery using phacoemulsification were reviewed.

Exclusion criteria were an IOP higher than 21.0 mmHg before cataract surgery, the use of antiglaucoma medications before surgery, cases that needed iris manipulations like dissection of posterior synechiae or pupil dilation with iris retractors during cataract surgery, cases with interval between filtering surgery and cataract surgery shorter than 6 months, and cases with follow up period shorter than 6 months.

Phacoemulsification was performed through 3.2 mm upper temporal or upper nasal clear corneal incision, and a foldable acrylic posterior chamber intraocular lens was inserted in the capsular bag.

Medications after phacoemulsification consisted of combined topical steroid and antibiotic 5 times/day and tapered gradually over approximately 5 weeks.

The IOP, the size and shape of the filtering blebs were recorded before three months and 6 months after phacoemulsification. The filtering blebs were classified according to their size into 3 grades, large (>10 mm) in transverse diameter, medium (between, 10 and mm) and small (<5 mm) and were classified according to their shape into diffuse and localized blebs.

### **Results**

Thirty five eyes of thirty patients were enrolled in this study, 17 of them were females and 13 were males. The mean age at the time of cataract surgery was 58.8 years + 13.5 (SD) (range 30 to 81 years).

The mean IOP before cataract surgery was 13.3 mmHg + 3.4 (SD) (range 8.0 to 20.0 mmHg). All the cases had functioning blebs, 10 of them had large blebs, 19 had medium size blebs and 6 had small blebs. As regard the shape of the bleb 24 cases had diffuse blebs, and 16 had localized blebs (Table 1). The mean interval between trabeculectomy and cataract surgery was 20 months + 9.1 (SD) (range 6 to 40).

Three months after cataract surgery the mean IOP was 14.5 mmHg + 3.8 (SD) (range 9.0 to 24.0 mmHg), two cases showed rise of IOP above 21.0 mmHg, one of them was 22.0 mmHg and the other was 24.0 mmHg and their blebs became smaller and shallower. Another 6 cases showed changes in the size of their blebs but continued with IOP below 21.0 mmHg and functioning blebs, (Fig. 1, 2, 3)

(Table 2).

Six months after cataract surgery the mean IOP was 14.6 mmHg + 4.6 (SD) (range 9.0-26.0 mmHg). Only one more case showed bleb failure and rise of IOP above 21.0 mmHg. The previous two cases with bleb failure showed more rise of IOP and needed antiglaucoma therapy. Two more cases showed morphological bleb changes without loss of IOP control (Table 2). The remaining 24 cases continued with nearly the same levels of preoperative IOP and also the same size and shape of their blebs.

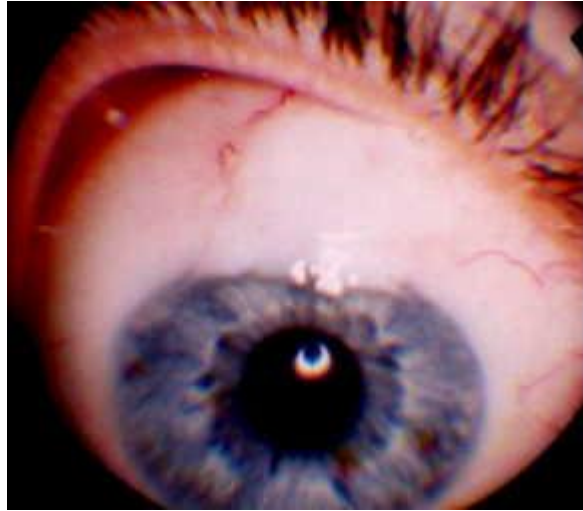


Fig. 1: Preoperative functioning bleb of one of the cases.



Fig. 2: The same patient three months postoperatively showing changes in shape and size of the bleb.

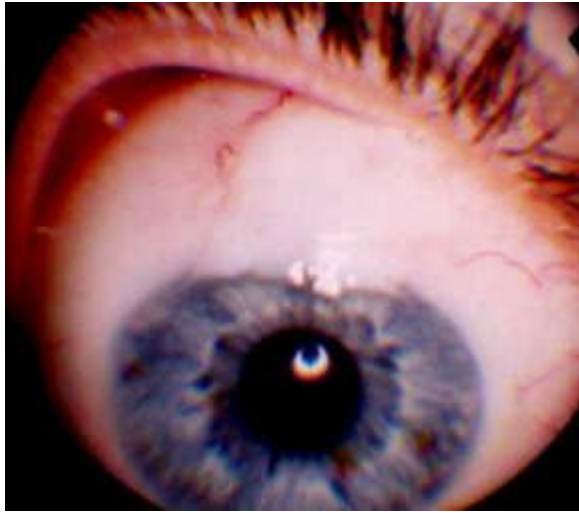


Fig. 3: The same patient six months postoperatively showing more changes in shape and size of the bleb.

**Table 1: Patients criteria**

	Mean IOP	Bleb size			Bleb shape	
		L	M	S	D	L
Pre- operative	13.3 + 3.4	10	19	6	24	11
3 months post op.	14.5 + 3.8	9	16	10	23	12
6 months post op.	14.6 + 4.6	8	14	13	20	15

**L = Large bleb M = Medium bleb S = Small bleb D = diffuse bleb l = localized bleb**

**Table 2: Criteria of cases with bleb changes**

No	Age	Sex	Interval in months	IOP in mmHg			Bleb size			Bleb shape		
				Pre op	3m	6m	Pre op	3m	6m	Pre op	3m	6m
1	45	♀	24	15.0	16.0	16.0	S	S	S	D	d	L
2	60	♀	7	10.0	17.0	24.0	L	L	S	L	l	L
3	65	♂	18	17.0	18.0	17.0	M	S	S	L	l	L
4	46	♂	36	14.0	15.0	14.0	M	S	S	D	d	D
5	44	♀	28	14.0	22.0	25.0	S	S	S	D	l	L
6	59	♀	8	11.0	11.0	11.0	M	S	S	L	l	L
7	67	♀	25	18.0	19.0	19.0	M	M	S	D	d	D
8	30	♀	18	19.0	19.0	20.0	M	M	S	D	d	L
9	32	♀	16	18.0	24.0	26.0	M	S	S	D	d	D
10	66	♂	6	14.0	16.0	14.0	L	M	M	D	d	D
11	52	♀	20	12.0	16.0	17.0	M	M	M	D	d	L

L = large M = medium S = small l = localized d = diffuse

## Discussion

Cataract is the most common late complication after trabeculectomy<sup>7</sup>; hence, cataract surgery in the presence of a filtration bleb is a common surgical challenge, and loss of IOP control in the early postoperative period is a well- described finding after cataract extraction<sup>8</sup>. However in the intermediate and long-term phacoemulsification has been reported to have a minimal or no effect on the mean IOP after trabeculectomy.<sup>5,9</sup>

In this series 5.7% of cases lost IOP control three months after phacoemulsification and 8.6% had bleb failure and needed antiglaucoma medication 6 months after phacoemulsification.

The reason for the probability of loss of IOP control after routine phacoemulsification is not known, but it may involve the break down of the blood aqueous barrier that accompanies phacoemulsification and the release of inflammatory mediators leading to reduced bleb function.<sup>10,11</sup>

Chen et al.<sup>12</sup> emphasized that an interval of fewer than 6 months between trabeculectomy and cataract surgery (phacoemulsification and ECCE) was a significant risk factor for loss of IOP control; also many authors reported that IOP control decreases with time after successful trabeculectomy.<sup>2,3</sup>

In this series only cases with more than 6 monthly intervals between trabeculectomy and cataract surgery were enrolled and the follow up period was 6 months for all the cases in order to eliminate the time factor as a cause of bleb failure.

Although the effect of cataract surgery (mainly ECCE) on the mean IOP in filtered patients has received considerable attention; its effect on bleb morphology has received less attention. Yamagami and coauthors<sup>13</sup> retrospectively studied the effect of ECCE or phacoemulsification in 45 eyes that had trabeculectomy and found that only 44% were free of bleb scarring after 2 years.

In this study 31.4% of cases showed changes in the size and shape of their blebs six months after phacoemulsification but only 8.6% of all the cases included in the study had bleb failure.

In conclusion, phacoemulsification using a clear-corneal incision away from the bleb site has minimal effect on the long term mean IOP and the morphology of the filtering bleb, but there is more than 8% incidence of failure of the bleb function after follow-up period of six months.

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