

Microsurgical trabeculectomy in Ghana

S. CHATTERJEE AND M. W. ANSARI

Korle Bu Teaching Hospital, Accra, Ghana

A tendency to excessive fibrosis in African eyes has been found to be the cause of a high failure rate in filtering operations (Berson, Zauberman, Landau, and Blumenthal, 1969). Welsh (1970), who analysed the results of filtering operations in S. Africa and found a failure rate of 54 per cent. caused by fibrosis of the filtering blebs, suggested that trabeculectomy might be helpful. As Tenon's capsule was held to be mainly responsible for fibrosis of the filtering bleb, excision of this structure during filtering operations improved the success rate to 90 per cent. (Ben-Sira and Ticho, 1969, 1971), but this method added the further complication of a thin bleb.

In principle, trabeculectomy ensures internal drainage and therefore avoids all the complications of a filtering bleb, such as closure by fibrosis, swelling, prolonged irritation, and sometimes necrosis and infection. The technique of trabeculectomy described by Cairns (1968) appealed to us for drainage operations in African eyes, and we tried it in a preliminary series of twelve Ghanaian eyes with advanced open-angle glaucoma. The control of tension was satisfactory and the series has been reported elsewhere (Chatterjee, 1971).

The question remained, however, whether the tendency to excessive fibrosis in the African would in course of time also interfere with the internal drainage channels opened by trabeculectomy.

A further review of these cases revealed some interesting features: *viz.* the formation of postoperative filtering blebs and subsequent fibrosis of some of them which did not affect the control of tension. Similar observations were made in a second series of twelve Ghanaian eyes with advanced open-angle glaucoma treated by trabeculectomy in the same way.

This paper presents the pattern and behaviour of these filtering blebs in relation to the tendency to excessive fibrosis (taking the clinical evidence of bleb-fibrosis as the criterion); it also illustrates the effects of trabeculectomy in African eyes.

Material and methods

CASE SELECTION

All the patients were Africans attending the glaucoma clinic of Korle Bu Teaching Hospital with advanced open-angle glaucoma with contracted fields, cupped discs, and tension uncontrolled by miotics.

OPERATIVE TECHNIQUE

The method of Cairns (1969) was used with two minor alterations (Chatterjee, 1971); a limbal-based half-thickness scleral flap was dissected down instead of the flap reflected from the limbus, and the operation was performed under local instead of general anaesthesia.

Observations

The Chart summarizes the important features of the 24 cases, both preoperatively and postoperatively.

A monthly record of the behaviour of the bleb, the tension, and the effect of bleb-fibrosis on tension was kept for each case.

(A) BLEB FORMATION

(1) Immediate and diffuse bleb formation was noted in seven cases (1, 3, 4, 5, 8, 13, and 22) in the immediate postoperative period.

In Case 1, it gradually localized into a small bleb over a period of 5 months and became completely fibrosed in 8 months. The tension remained controlled (below 21 mm. Hg Schiötz) during the whole period of study of 12 months.

In Cases 3, 13, and 22, the blebs fibrosed completely in one month, but the tension remained low and controlled.

In Cases 4 and 5, the blebs have lasted for more than 12 months with no tendency to fibrosis.

In Case 8, the bleb localized into a tiny bleb at one corner and is persisting. The tension was not much altered by the operation.

(2) A delayed formation of a small bleb was noticed in six cases (2, 7, 9, 11, 12, and 20). None of these had any bleb during the first month; but a small bleb appeared at one corner of the scleral flap after 2 to 4 months and is still persisting.

In Case 7, this bleb was attributed to a second operation for a prolapsed iris (Chatterjee, 1971).

The development of these blebs did not alter the tension to any significant extent, and it is remarkable that the number of bleb formations was considerably less in the second series (see Chart).

(B) EFFECTS ON TENSION


In the first series, eleven out of twelve cases (Chatterjee, 1971) were successful. In the second series, eight out of twelve had an immediate reduction in tension and this has been maintained. Four cases (14, 17, 21, and 24) had raised tension postoperatively because of various complications:

Case 14 had a narrow open angle and postoperatively the anterior chamber was found to be shallow with raised tension. The angle was closed all round in the second week. Pilocarpine drops 6 per cent. were prescribed and the angle opened up gradually when the tension came down satisfactorily. The trabeculectomy opening was found to be free, but the drops had to be continued to keep the tension down.


In Case 17 the tension was high after the operation. The operation was complicated by hyphaema which required a washout, and some hyphaema persisted during the immediate postoperative period; in the third week the angle was found to be open and clear all round except at the trabeculectomy hiatus, where it was blocked by iris tissue. Pilocarpine drops 6 per cent. were prescribed; this partly opened up one corner of the trabeculectomy opening and the tension came down. The pilocarpine was discontinued after 6 weeks.

Series	Case No.	Open-angle grade	Preoperative appplanation tension (mm. Hg)	Date of operation	Postoperative appplanation tension (mm. Hg) for 12 months												
					1	2	3	4	5	6	7	8	9	10	11	12	
1	1	Medium	30	20. 8.70	14	15	12	16	18		14	18	20	18	18	12	12
	2	Medium	28	10. 9.70	20						20	18	12	12	12	12	15
	3	Wide	32	24. 9.70	12			left country			14						
	4	Wide	25	24. 9.70	8								8				12
	5	Medium	38	17. 9.70	20												12
	6	Wide	40	29. 9.70	18												20
	7	Narrow	42	15.10.70	*40	Did not return	18	12	12	14		12	18	12	12	12	12
	8	Narrow	38	8.10.70	18		12	20	20	10	18	16	16	16	14	12	12
	9	Medium	28	11.11.70	18		14	12	12	12	15	20	20	20	20	20	20
	10	Medium	45	29.10.70	14		14	12	12	12	17	18	18	18	18	18	18
	11	Medium	54	10.12.70	18		12	12	12	12	12	12	12	12	12	12	12
	12	Medium	32	8. 1.71	14		12	12	12	12	12	12	12	12	12	12	12
	13	Narrow	40	3.12.70	18		15	14	12	12	15	12	12	12	12	12	12
	14	Narrow	48	10.12.70	*30		20	20	20	20	20	20	20	20	20	20	20
	15	Wide	40	11. 2.71	20		14	10	10	10	10	10	10	10	10	10	10
	16	Wide	32	25. 2.71	12		12	12	12	12	12	12	12	12	12	12	12
	17	Wide	54	1. 4.71	*34		15	20	20	16	12	12	12	12	12	12	12
	18	Narrow	33	15. 4.71	12		12	12	12	12	12	12	12	12	12	12	12
	19	Medium	48	29. 4.71	12		12	12	12	12	12	12	12	12	12	12	12
	20	Narrow	34	6. 5.71	12		18	13	13	13	14	14	14	14	14	14	14
	21	Wide	34	25. 2.71	*28		32	22	22	22	22	22	22	22	22	22	22
	22	Wide	52	27. 5.71	16		18	18	18	18	18	18	18	18	18	18	18
	23	Wide	45	15. 5.71	12		Did not return										
	24	Medium	50	12. 5.71	*35		28	18	18	18	18	18	18	18	18	18	18

 = Large localized bleb


 = Mini (Small) bleb at one corner

 = No bleb

 = Diffuse bleb formation at operation site

 = Had hiatus block by iris

 = Had angle block


 = Had iritis

 = On Drops 6%

 = Had hiatus block by iris

 = Had angle block

 = Had iritis

 = Had iritis

 = Had iritis

Case 21 had a full hyphaema on the 4th postoperative day, which was washed out. Some iritis developed, and this lingered for 4 months with raised tension. The tension came down when the flare disappeared.

Case 24 had a prolonged postoperative iritis, with flare and posterior synechiae, which took 3 months to bring under control. The tension came down when the flare disappeared.

Discussion

The incidental bleb formation in trabeculectomy afforded an excellent opportunity to study the excessive tendency to fibrosis in the African eye in relation to its effects on the control of tension. Although excessive fibrosis is said to be a characteristic feature of African eyes, it was not very obvious in all our cases. Of the seven eyes (of the present series of 24) which developed an immediate diffuse bleb, only four showed marked fibrosis and closure of the blebs after a short period. In two other cases no tendency to fibrosis was noted and in the remaining case the bleb fibrosed partly to a small bleb which is persisting. Therefore five out of seven cases showed this tendency to excessive fibrosis, yet in none of them was the control of tension affected (see Chart). This suggests that the internal drainage channels probably do not take part in the process of fibrosis even when the bleb fibrosis is remarkably rapid.

The eleven eyes which did not develop any bleb and the six which developed delayed small blebs showed no tendency to increased tension during the study.

Cairns (1968, 1969) had five cases with bleb in his first series of seventeen and in half of his second series of 49. One out of eleven cases of Linnér (1969) and 57 per cent. of 44 cases of Watson (1970) had blebs.

The immediate bleb formation was considered to be due to a leak at the edges of the scleral flap which was not closed properly (Watson, 1969; Chatterjee, 1971). Two measures have been suggested to rectify the fault (Quarcoopome, 1970) and these were adopted in our second series. Firstly, more care was taken to make a single scleral incision with a pointed Bard-Parker blade to avoid multiple scratches and irregularity of the scleral flap margins. Secondly, more stitches were put in at the top of the flap to hold it tightly in place, *i.e.* three stitches at the top and two at the sides.

The results in our second series were remarkable; only three cases (2 immediate and 1 delayed) developed blebs compared with ten (5 immediate and 5 delayed) in the first series.

The delayed bleb formation appeared to be due to a minute track formation along one of the sutures at one corner of the scleral flap. Such blebs did not affect the ocular tension.

Conclusion

Trabeculectomy has worked well in a series of 24 African eyes (duration of follow-up 5 to 12 months). The tendency to excessive fibrosis, as manifested clinically by a rapid fibrosis of the incidental filtering bleb formation in some cases, did not affect the control of tension. This suggests that the internal drainage channels opened up by the trabeculectomy were not involved in the tendency to excessive fibrosis.

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