THE FELLOW EYE: ANALYSIS OF 50 CASES OF ACUTE CLOSED-ANGLE GLAUCOMA

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From August 1962, the Glaucoma Clinic was held every Saturday morning at the Ophthalmic Department, General Hospital, Singapore. The primary object was to obtain better supervision and management of patients with glaucoma, which is a major cause of blindness in Singapore. Patients registered since 1955 with the diagnosis of glaucoma were requested to attend the Glaucoma Clinic and their condition reviewed and analysed. The results were worth the effort, as several patients whose eyes required operation or further medical control were detected and some significant data on the disease are being compiled.

Chandler (1952) Bain (1957) and Lowe (1962) have stressed the importance of peripheral iridectomy in the fellow eye, after an initial attack of acute closed-angle glaucoma in the first. Lowe published figures to support their contention. However, regional statistical figures on the disease are selective, and therefore conclusions cannot be drawn for the disease in general, especially in different races and in different countries. It is the deliberate aim of the author to compare the figures of the present series with the previous reports in a further attempt to establish that peripheral iridectomy should be done routinely in the fellow eye of a patient after an attack of acute closed-angle glaucoma in the first, irrespective of negative symptoms and provocation tests.

This paper surveys the results of management of the fellow eye in 50 patients with acute close-angle glaucoma, taken from 1955 to 1961.

TABLE I
Mode of presentation.

Bilateral	Bilateral presentation	9	13
	Bilateral onset	4	
Unilateral			37
TOTAL			50

The mode of presentation of the cases was of interest, (table I). 13 patients presented with involvement of both eyes of which 4 had the attack on both eyes simultaneously, while in the other 9 patients the histories were too vague to decide whether the attacks began simultaneously. Since both eyes were involved at examination, they were considered in this group. 37 cases presented with unilateral glaucoma. It will be noted that of these, only 8 had prophylactic surgery compared to 29 patients treated non-surgically (table II). This is largely because until recently, routine prophylactic surgery was not generally considered a justified procedure.

TABLE II
Treatment of fellow eye after unilateral attack of acute glaucoma.

Prophylactic surgery	8
Non-surgical treatment	29
Total	37

NON-SURGICAL TREATMENT

Non-surgical treatment in this series included all the cases not treated surgically, whether or not they received any treatment at all.

TABLE III
Non-surgical treatment.

None	22
Pilocarpine	3
Others	0
Unrecorded	4
TOTAL	29

Of the 29 patients treated non-surgically, 22, the large majority received no treatment at all,

(Table III). Only 3 were treated with Pilocarpine eye-drops. None of these patients attended regularly for their eye-drops and one patient developed an acute attack during the period when she neglected to turn up for treatment. Most of the fellow eyes were not investigated further partly because of the general lack of stress in the care of the fellow eye and partly because the glaucoma patients were formerly treated in the General Ophthalmic Outpatient often under the care of a new medical officer.

TABLE IV
The result of Non-surgical Treatment.

Developed attack			17
No recorded attack	No attendance		0
	Attendance	1 year 0	12
		2-5 years 9	
		5 years 3	
TOTAL			29

Of the 29 patients treated non-surgically, 17 (58.6%) patients developed an acute closed-angle attack in the fellow eye, (Table IV). Lowe's figures (1962) recorded that 58 out of 113 patients treated "conservatively" developed an attack in the fellow eye (51.3%). 12 patients had no record of an attack. 9 have been attending from 2 to 5 years and 3 have attended for more than 5 years. They have not been operated on during their recent attendance at the Glaucoma Clinic mainly because they refused operation and partly because they were too old, or because clinical examination and provocation tests were all negative and it was decided that they should be observed.

TABLE V
Interval of attack between the first and second eye.

0 — 1 year	10
2 — 5 years	5
5 — 10 years	2
TOTAL	17

The interval between the attack (Table V) in the first eye and the fellow eye is interesting in that the majority (10 out of 17) had the attack within one year of the attack in the first eye. In five cases, the attack in the fellow eye occurred between 2 to 5 years after the attack on the first eye and in two patients the attack occurred after a period of over 5 years.

TABLE VI
Time lapse before patient visited ophthalmologist after an acute attack of the fellow eye.

Under 24 hours	5
< 3 days	2
< 1 week	3
< 4 weeks	2
< 6 months	2
> 6 months	1
not recorded	2
TOTAL	17

It is also interesting to know how long after the attack has begun in the fellow eye before the patient came for treatment (Table VI). 5 of 17 were seen within 24 hours of the attack. These patients were in the wards for various reasons and the attacks were diagnosed by the medical officers during their daily ward rounds. 5 patients came for treatment within one week, while another 5 did not come till after a week. In 2 patients no record was made of the interval.

Of the 5 patients who did not come for treatment after the attack began for more than a week 4 were totally or subtotally blind and 1 had 6/24 vision as a result of the attacks. On the other hand, of the 5 who were seen and treated within 24 hours, 2 had normal vision, had 6/12 (industrial) vision, and 2 had 6/18 (partially sighted) vision. There is little doubt about the direct relationship between the time treatment is received and the amount of visual loss.

PROPHYLACTIC PERIPHERAL IRIDECTOMY

Of the 8 patients, 7 had peripheral iridectomy done, while one had iridenclesis (Table

VII). Iridenclesis was done as clinical, tonographic and gonioscopic investigations showed that there was obstruction in the outflow of aqueous besides the presence of a narrow angle.

TABLE VII

Types of prophylactic surgery done.

Peripheral iridectomy	7
Iridenclesis	1
Other operations	0
TOTAL	8

In this series of 8 cases (Table VIII) there were no complications either at operation or post-operatively. No further attacks of glaucoma were recorded. Lowe (1962) in his series of 58 cases treated surgically, recorded one patient who developed acute glaucoma after peripheral iridectomy.

TABLE VIII

Result of prophylactic surgery

Complication of surgery				0
Developed attack				0
No recorded attack	No attendance		1	8
	Attendance	1 year 0	7	
		2-5 years 5		
		>5 years 2		
TOTAL				8

In an analysis of 50 cases of peripheral iridectomy done recently at the Ophthalmic Department General Hospital, Singapore, the author found no significant complication following peripheral iridectomy as a prophylactic procedure in the fellow eye.

VISUAL RESULT

There is little controversy that in any analysis of the result of treatment of ocular conditions, the visual result is important. In this series, (Table IX), it served as another means to establish the comparatively superior results attained with prophylactic surgery as compared to non surgical treatment.

TABLE IX

A Comparative visual results of those treated with prophylactic surgery and conservative treatment.

		6/9 or better (Normal vision)	6/9 partly – 6/12 partly (Industrial vision)	6/18 — 6/60 (partially sighted)	less than 6/60 (partially blind)	less than hand movements (subtotally or totally blind)	TOTAL
SURGERY		4	3	1	0	0	8
Non-surgical treatment	No recorded attack	3	4	3	1	1	12
	Developed attack	2	1	7	2	5	17
	TOTAL	5	5	10	3	6	29

Of the 8 patients treated with prophylactic surgery, 4 had normal vision (6/9 and better) and 3 had industrial vision. Only I had vision of 6/36 because of a preoperative senile cataract. Of the 12 patients who were treated non-surgically and had no recorded attack, 5 had visual acuity of 6/18 or worse: 3 were due to senile cataract, 1 to old choroiditis, and 1 to corneal opacity as a result of trachoma. Of the 17 patients who developed acute closed-angle glaucoma attack only 1 had industrial vision, 2 had normal vision, while 14 had vision of 6/18 and worse: of these 7 were blind; 6 were due to optic atrophy with cupping, and 1 due to advanced trachoma with corneal opacity. Of the 7 who were partially sighted, 3 had optic atrophy with cupping, 2 had senile cataract, 1 had diabetic retinopathy and 1 had corneal opacity. Taking into consideration various possible statistical errors, these figures significantly show an over all poorer visual result in the patients who had acute close-angle attacks as a result of non-surgical treatment as compared to those who were treated with prophylactic surgery.

DISCUSSION

NON SURGICAL TREATMENT

The results of non surgical treatment of the fellow eye after an acute closed-angle attack in the first eye have been found to be extremely poor: 17 out of 29 cases (58.6%) developed an attack. The visual results were correspondingly poor (Table IX).

It is unfortunate that of the cases treated non surgically only 3 cases were treated with pilocarpine drops. Thus any conclusion drawn from this series must in fact be a comparison between cases treated surgically and those receiving no treatment at all. Of the 22 cases with no treatment 15 developed an attack (68.2%).

Conservative treatment with pilocarpine for the fellow eye has not given satisfactory results (Lowe 1962). Furthermore, there are numerous difficulties associated with its constant use.

The use of pilocarpine means repeated visits to the clinic, repeated and regular use of the eyedrops, and the discomfort and refractive changes as a result of its action on the ciliary muscles. Another difficulty is persuading the patients to come regularly, year after year for application of eyedrops and clinical followup when the fellow eye is apparently normal with normal vision. Thus, after turning up for several months, it is not uncommon for them to fail to turn up for further treatment. And, despite all the inconveniences and discomforts there is the constant fear, for the ophthalmologist and patient alike, that an acute attack may suddenly develop during the course of medical treatment.

Local eyedrops other than pilocarpine and even systemic treatment have been used from time to time with dubious results. Eserine eyedrops is not generally used as a prophylactic miotic because it deteriorates rapidly and prolonged therapy results in sensitization. Oral diamox has not been shown to be effective in preventing attacks, and this is not surprising as the drug has no effect on the pupil. The stronger miotics i.e. demacarium bromide and di-isopropyl fluorophosphate (D.F.P.) have been found to actually precipitate an acute attack.

It appears that there is no ideal miotic or other form of medical treatment. Pilocarpine is apparently the only "safe" eyedrop to use over a prolonged period. However, the strength of the drop is empirical: even when 4% pilocarpine is regularly used, an acute attack can still occur.

In all, if it is decided that the patient should be treated conservatively, the most important part of the management will be to warn the patient of the danger symptoms and emphasise the urgency of early treatment when the danger symptoms develop. The patient should be told in nouncertain terms the significance of the transient attacks of haloes, the transient attacks of blurred vision, of congestion and headache or eyeache. It will be important at subsequent visits for the ophthalmologist to ask for the presence of each of these symptoms specifically.

It is to be noted that it would be unwise to manage an unco-operative or a dull patient conservatively. Similarly, for patients who stay a great distance from a practicing ophthalmologist, the best advice is for an early prophylactic peripheral iridectomy.

PROPHYLACTIC PERIPHERAL IRIDECTOMY

It is obvious from the above statistics that no treatment of the fellow eye after the first eye has had an acute closed-angle attack, leaves much to be desired.

It is now universally accepted that acute closed-angle glaucoma is essentially a bilateral disease. Both Bain (1957) and Lowe (1962) have shown that the majority of the fellow eye becomes affected with an acute attack whether it is left without treatment or when treated with miotics.

At the moment there is considerable disagreement whether the fellow eye which is symptom free and which shows a rise of less than 8 mm. hg. should be treated with prophylactic peripheral iridectomy.

There is no doubt that an iridectomy should be performed in the fellow eye if it presents with symptoms of incipient glaucoma. In those patients who show a rise of tension of 8 mm. Hg. or more the problem is easier, for most surgeons will not hesitate to advise operation in these cases. Unfortunately, most patients' fellow eye presents no symptoms and provocation tests are negative both in the dark and with a mydiatric. We know that a negative provocation test does not mean that an attack will not occur and that even with medical therapy of pilocarpine, such attack may still occur. On the other hand, surgery is simple and safe. Chandler (1952) described a method of peripheral iridectomy which will remain a classic for its simplicity and its safety and it can be rapidly performed under mild sedation with or without general anaesthesia, retrobulbar anaesthesia and facial akinesia.

The criteria for peripheral iridectomy in patients who have suffered from an acute closed-angle attack is based on the universally accepted mechanism for the acute attack, known as the Curran-Chandler mechanism. It postulates that the initial change is a physiological pupillary block which will result in the aqueous of the posterior chamber pushing the iris forwards creating a physiological iris bombe effect. In eyes with wide or average filtration angle width nothing else occurs. However, in eyes with narrow filtrating angles, an irido-cornea contact will result which will in turn obstruct outflow of the aqueous causing a raised intraocular tension. It follows that a peripheral iridectomy will serve as a by-pass for the aqueous of the posterior chamber from where it can flow directly into the anterior chamber and the filtrating angle. There will be no physiological iris bombe effect and the danger of an acute closed-angle attack eliminated.

SUMMARY AND CONCLUSION

Prophylactic peripheral iridectomy in the fellow eye of patients after an attack in the first eye without symptoms and with provocation tests of less than 8 mm. Hg. rise in intraocular tension is not generally accepted as a routine procedure.

Most surgeons will perform a periphery iridectomy in patients with symptoms and some will operate if the provocation tests are positive. However, since the provocation tests are time consumming, not without errors, and not without dangers they are often not done by opthalmologists especially those in private practice.

This article further confirms that acute closed-angle glaucoma is a bilateral disease. Of the 50 cases, 30 were bilateral (60%); 13 presenting with bilateral attack and 17, although initially unilateral, the fellow eye developed an attack later. It follows that when an attack of acute closed-angle glaucoma has occurred in one eye, the fellow eye should be considered to be in potential danger and carefully investigated.

There is no doubt that peripheral iridectomy as described by Chandler (1952) is simple and safe. However, it is an intraocular operation with its associated dangers. The important consideration is to equate the dangers of the operation against that of leaving the fellow eye untreated: few can now dispute the fact that the danger of operation is far less than the danger of leaving the fellow eye alone.

Unfortunately this series does not justify a comparison between the effectiveness of periphery iridectomy and conservative treatment with pilocarpine and/or other therapy. However, conservative treatment has the inherent difficulty of requiring patients to constantly apply drops and repeatedly attend clinics for

treatment of an apparently normal eye for the rest of his life. Moreover, despite regular medical therapy an attack can still occur.

The author is convinced that peripheral iridectomy is the treatment of choice for the fellow eye and believes that conservative treatment should be reserved only for patients who refuse surgery.

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