

Fellow eye in angle-closure glaucoma

S. W. HYAMS, Z. FRIEDMAN, AND C. KEROUB

From the Department of Ophthalmology, Rothschild Hospital, and the Aba Koushy Medical School, Haifa, Israel

Acute angle-closure glaucoma is eventually bilateral in 36 to 68 per cent. of cases (Adams, 1955; Kronfield, 1955; Winter, 1955; Bain, 1957; Lowe, 1962; Genée, 1973). Duke-Elder and Jay (1969), summarizing the findings of many authors, stated that a peripheral iridectomy to the fellow eye is justified in almost every patient in whom angle-closure glaucoma (ACG) has developed in one eye.

We could find only one report in which the fellow eye of patients with ACG was investigated by the performance of provocative tests (Bain, 1957) and only one report in which the bilaterality of intermittent and chronic ACG was studied (Leighton, Phillips, and Tsukahara, 1971). In the present study of 118 patients with various forms of ACG, every effort was made to detect ACG in the fellow eye, including the performance of provocative tests.

Material and methods

From January, 1965, until December, 1973, 118 new cases of ACG were seen in our department, constituting three groups:

- GROUP 1 71 patients in whom the primarily affected eye presented with the classical picture of primary acute ACG.
- GROUP 2 41 patients in whom the primarily affected eye presented with intermittent or chronic ("creeping") ACG. The diagnoses in these cases was based upon some or all of the following features: a history of haloes, intermittent pain and blurred vision, intermittent elevation of intraocular pressure accompanied by gonioscopic closure of the anterior chamber angle, raised intraocular pressure associated with a narrow anterior chamber angle containing goniosynechiae, and positive provocative tests.
- GROUP 3 Six patients in whom the primarily affected eye presented with acute ACG secondary to an intumescent cataract.

The examination of the fellow eye included gonioscopy, tonography, perimetry, and repeated tonometry. If a

spontaneous rise in tension of more than 23 mm. Hg accompanied by gonioscopic closure of the angle did not occur, dark-room and/or prone-position provocative testing was performed. In patients in whom these provocative tests were negative or equivocal, the mydriatic test was performed—except in cases in which vision was defective in the primarily affected eye. The dark-room test was performed by having the patient sit in a dark room with a light-tight bandage over both eyes for 1 hr. The prone-position test was performed by having the patient lie in the prone position for 1 hr (Hyams, Friedman, and Neumann, 1968). The mydriatic test was performed by the instillation of 1 drop of 10 per cent. phenylephrine. A rise in pressure of 8 mm. Hg or more, with gonioscopic closure of the chamber angle, during any of the provocative tests was considered to be positive.

Results

ACG was diagnosed in the fellow eye and peripheral iridectomy was performed in 85 of the 118 patients in the series (72 per cent.) including 51 of the 71 patients in Group 1 (72 per cent.), 29 of the 41 patients in Group 2 (71 per cent.), and five of the six patients in Group 3 (83 per cent.) (Table I). Leaving

Table I *Type of ACG in 118 primarily affected eyes and prevalence of ACG in fellow eye*

<i>Type of ACG in primarily affected eye</i>	<i>No. of eyes</i>	<i>Fellow eyes with ACG</i>	
		<i>No.</i>	<i>Per cent.</i>
Primary acute	71	51	72
Intermittent or chronic	41	29	71
Secondary acute	6	5	83
Total	118	85	72

aside the eleven patients who failed to attend for follow-up examinations, including three patients who disappeared temporarily and returned later with acute glaucoma in the fellow eye (see below), ACG was bilateral in 82 out of 107 patients (76.6 per cent.)

Address for reprints: Dr. S. W. Hyams, Department of Ophthalmology, Central Emek Hospital, Afula, Israel

Table II shows how the diagnosis of ACG was established in the fellow eye in the 85 cases in which glaucoma was bilateral. Among the 71 patients in Group 1, five presented with bilateral acute glaucoma and nine suffered acute glaucoma in the fellow eye at a later date. In three of these nine patients the interval between the attack in the first eye and the attack in the fellow eye was 1 to 3 days, and in three the interval was between 2 to 8 weeks. In two of these last three patients, provocative tests had been performed and were positive, and the patient was scheduled for iridectomy in the fellow eye at the time of the attack. In three patients the interval between the attack of acute glaucoma in each eye was 3 to 6 years: these three patients failed to attend for examination in the interval between the attacks in each eye.

In 21 patients in Group 1 the fellow eye exhibited a spontaneous rise in tension of more than 23 mm. Hg, accompanied by angle closure, but not in an acute form. In sixteen patients in this group, the fellow eye was normotensive on repeated examination but one or more of the provocative tests was positive.

In twenty of the 41 patients in Group 2, the fellow eye exhibited a spontaneous rise in tension of more than 23 mm. Hg, and in nine patients in this group the fellow eye was normotensive on repeated examination and glaucoma was diagnosed only by means of provocative tests. Acute glaucoma did not occur in the fellow eye in any patient in this group (Table II).

In two of the five patients in Group 3, the fellow eye presented with acute glaucoma (due in one case to an intumescent lens). In one eye there was a spontaneous rise in tension and in two eyes the glaucoma was diagnosed only by means of provocative tests.

In 76 of the 85 fellow eyes in which iridectomy was performed, the intraocular pressure was controlled postoperatively without medication. In seven of the nine eyes in which medication was required to control intraocular pressure after iridectomy, goniosynechiae were present (two of these seven eyes had had acute angle-closure glaucoma).

Table III shows clinical details concerning the 33 fellow eyes in which ACG was not demonstrated. In seventeen patients provocative tests were per-

Table II *Criteria for diagnosis of ACG in fellow eye in 85 cases in which glaucoma was bilateral*

<i>Type of ACG in primarily affected eye</i>	<i>Criteria for diagnosis of ACG in fellow eye</i>				<i>Total</i>
	<i>Bilateral simultaneous acute glaucoma</i>	<i>Acute glaucoma at later date</i>	<i>Spontaneous rise in tension with angle closure</i>	<i>Normal tension with positive provocative tests</i>	
Acute	5	9	21	16	51
Intermittent or chronic	—	—	20	9	29
Acute due to lens	—	2*	1	2	5
Total	5	11	42	27	85

* Including one case of secondary acute glaucoma

Table III *Clinical details concerning the fellow eye in 33 cases in which bilateral ACG was not demonstrated*

<i>Type of ACG in primarily affected eye</i>	<i>Provocative tests</i>				<i>Total</i>
	<i>Negative</i>	<i>Not performed because of age of patient and/or presence of cataract</i>	<i>Anisometropia with wide angle in fellow eye</i>	<i>Patient disappeared</i>	
Primary acute	12	3	1	4	20
Intermittent or chronic	5	3	1	3	12
Acute due to lens	—	—	—	1	1
Total	17*	6	2	8	33

* Dark-room, prone-position, and mydriatic tests performed on six patients; dark-room and prone-position tests performed on eleven patients

formed and were negative. In six patients the provocative tests were not performed because of the advanced age of the patients and/or the presence of a cataract. In two patients there was anisometropia, with a wide anterior chamber angle in the fellow eye. Eight patients failed to attend for provocative testing; one of these patients is known to have died and the fate of the other seven could not be ascertained.

Discussion

In the present study, ACG was bilateral in 72 per cent. of 118 patients with this condition compared to 33 to 68 per cent. reported by other authors; the difference was probably due to the fact that provocative tests were performed on the primarily unaffected eye in the present series.

Adams (1955) found that 54 per cent. of fellow eyes will develop raised tension if prophylactic iridectomy is not performed, and Kronfield (1955) stated that 50 per cent. of fellow eyes will develop an acute attack within 5 years.

Winter (1955) reported 47 cases of acute ACG. In 32 patients an acute attack developed in the fellow eye within 5 years (68 per cent.). Twenty of these 32 patients were receiving miotics in the fellow eye at the time of the attack.

Lowe (1962) found that 58 of 113 fellow eyes (51 per cent.) developed acute ACG, 25 of them in spite of treatment with Pilocarpine.

Bain (1957) investigated 200 cases of acute ACG. In seventeen cases there was bilateral onset of acute glaucoma, and in seven cases a prophylactic iridectomy was performed in the fellow eye. Of the remaining 176 fellow eyes, 50 developed an acute attack (in spite of miotic treatment in 29 eyes), and 35 developed "prodromal symptoms of ACG" (in spite of miotics in 25 eyes). Altogether 102 of the 193 fellow eyes in which prophylactic iridectomy was not performed showed evidence of glaucoma (53 per cent.).

Leighton and others (1971) found ACG in the fellow eye in 33 per cent. of their patients, including eight out of 39 patients with acute or subacute ACG in the primarily affected eye and in twelve out of 24 patients with chronic ACG in the primarily affected eye.

Genée (1973) reported that acute glaucoma presented bilaterally in sixteen out of 146 patients and occurred at a later date in the fellow eye in 37 patients, in spite of Pilocarpine treatment. In all, 53 cases (36.3 per cent.) were bilateral.

The risks of prophylactic peripheral iridectomy are small but definite. Douglas and Strachan (1967) reported only one case of reduced visual acuity after 103 prophylactic iridectomies; there were fourteen complications, "mostly minor". Of 64 prophylactic-

ally operated eyes reported by Lowe (1962), one developed serious visual loss. In a later study, Lowe (1973) reported the results of prophylactic iridectomy in 26 fellow eyes: the only two patients with less than 6/12 vision had macular holes.

Ghoshal and Baxter (1969) reported that, out of 29 eyes in which prophylactic iridectomy was performed, only one needed miotics, two showed a drop in visual acuity from 6/6 to 6/9, and five had posterior synechiae.

Luke (1969) investigated the complications of iridectomy performed by junior surgeons on 110 eyes. One patient developed prolonged postoperative iritis and cataract. Another suffered vitreous loss at the time of iridectomy and subsequent iritis. Stripping of Descemet's membrane occurred in three eyes, and in one of these endophthalmitis developed 6 months later and the eye was lost.

The occasional complications of peripheral iridectomy, together with the impression that iridectomy tends to hasten cataract formation and cause lens-myopia (Sugar, 1970), makes it desirable to be selective in the performance of prophylactic surgery on the fellow eye of patients with ACG.

It would seem to be justifiable to perform a prophylactic iridectomy in the fellow eye in those patients who—for socioeconomic reasons—are unlikely to attend for follow-up examinations. These are the patients who are likely to neglect an acute attack in the fellow eye or in whom the silent formation of goniosynechiae in the fellow eye is likely to go undetected. The present survey has shown that over 70 per cent. of such fellow eyes are actually or potentially glaucomatous.

Among patients who can be relied upon to attend for follow-up examinations, it is possible to select the potentially glaucomatous fellow eyes by repeated tonometry and provocative testing, and thereby to avoid a prophylactic iridectomy in the fellow eye in about 23 per cent. of them.

Summary

118 consecutive patients with angle-closure glaucoma (ACG) were investigated. The primarily affected eye presented with acute ACG in 71 patients, with intermittent or chronic ACG in 41, and with acute ACG secondary to intumescent cataract in six.

ACG was demonstrated in the fellow eye in 85 of the 118 patients (72 per cent.), including 72, 71, and 83 per cent. respectively of the three groups distinguished above. In 27 fellow eyes, ACG was demonstrable only by provocative testing. Eleven patients failed to return for follow-up investigation. A routine prophylactic peripheral iridectomy in the fellow eye is justified in patients who are unlikely to attend for follow-up examinations, but may be avoided in about 23 per cent. of patients who attend regularly.

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