SURGICAL SAFETY OF PROPHYLACTIC PERIPHERAL IRIDECTOMY*†

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ALTHOUGH prophylactic peripheral iridectomy for the fellow eye of one which has suffered an attack of acute angle-closure glaucoma has become generally accepted in recent years, some surgeons are still hesitant about carrying it out because of the risk of operating on what in many cases is the patient's only good eye (Gilkes, 1963).

This study provides a detailed assessment of the risks of performing prophylactic peripheral iridectomy and compares them with the known risks involved in maintaining the fellow eye on miotic therapy.

Adams (1955), in a series of 48 fellow eyes, reported that 21 (43.7 per cent.) developed an acute angle-closure attack within 6 years, and in addition, five others were shown to have a rise in tension although not an acute angle-closure attack. He concluded that more than 54 per cent. of fellow eyes will develop raised tension if an iridectomy is not performed. Kronfeld (1956) stated that 50 per cent. of fellow eyes will develop an acute angle-closure attack within 5 years in spite of miotic therapy. Bain (1957), in a review of 200 cases, showed that 53 per cent. of second eyes developed an acute attack within 4½ years. The use of miotics prophylactically made no difference to the incidence of acute attacks but did lessen the incidence of prodromal symptoms.

Lowe (1962) confirmed the conclusions already outlined on the inefficacy of conservative medical treatment of the fellow eye, and compared the visual results of a group of medically-treated cases with those of a group subjected to prophylactic peripheral iridectomy. In his series the former group is the larger; four of 113 eyes sustained severe visual loss after angle-closure attacks. Unfortunately the number of eyes with acute angle-closure attacks which suffer severe visual loss in the acute stage or form extensive peripheral anterior synechiae (PAS) depends to a large extent on the speed with which the patient seeks specialist treatment, and is therefore beyond the control of the ophthalmologist. In Lowe's latter group of 64 cases, there was only one eye which suffered severe visual loss. This eye developed an angle-closure attack post-operatively in spite of a patent peripheral iridectomy, and the visual outcome was loss of light perception.

In our series a very similar sequence of events occurred, but fortunately the outcome was not serious; this will be discussed below. The precipitating therapeutic agent in the one case was phenylephrine 10 per cent. (Lowe) and in the other homatropine (Douglas and Strachan). Other surgical complications mentioned by Lowe are persistent fistulae and posterior synechiae. The latter, he stated "are very prone to occur", but this is not so in our experience.

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Some fellow eyes which do not receive the benefit of surgery and have an acute angle-closure attack probably retain good function for many years; others follow a less satisfactory course with formation of PAS and persistently raised tension which may necessitate filtration operations with their greater surgical trauma and uncertain long-term results. The post-operative complications occur in addition to the visual deterioration which may result from the acute attack.

One must agree with the statement of Lowe (1965) that "despite the advances that have been made in the concepts, diagnosis, and treatment in acute angle-closure glaucoma, the disease still leaves a trail of destruction in its wake". We shall attempt to show in detail how insignificant the "trail of destruction" can be after properly performed prophylactic iridectomy, and we agree with Perkins (1960) who implied that the operation is safe enough to be used as a diagnostic procedure.

Material

In the last 2 years, prophylactic peripheral iridectomy by the method described below, has been performed on 103 eyes in this department. The intra-ocular pressure of all of them was normal at the time of operation. Before operation most of the patients had been using miotics, and a few had been taking acetazolamide to maintain a normal pressure in the fellow eye.

The usual miotic was pilocarpine, but echothiophate was used on five eyes which had glaucoma of mixed type. All cases were examined with the gonio-lens pre- and post-operatively by one or other of the authors. The operations were performed by seven different surgeons of varying experience. In all cases the technique described here was used with only minor modifications. As there is no significant difference in the results of the different operators, the cases have been considered as one group.

Technique

An incision through conjunctiva and Tenon's capsule is made 6–8 mm. behind and parallel with the limbus. Both layers are reflected forwards to the limbus. Bleeding points are dealt with by gentle application of the cautery. A 2–3 mm. *ab externo* incision is made with a No. 15 Bard-Parker blade. The incision is made at that point on the limbus where the grey zone changes to the white of sclera. Swan (1959) has emphasized the importance of placing the incision correctly and has published photographs showing the unfortunate consequences of too posterior an incision. Blaxter and Chatterjee (1960) and Chandler (1963) have emphasized the importance of directing the incision at right angles to the surface of the globe to facilitate iris prolapse. This advice was followed in all cases. When the blade has almost penetrated the anterior chamber, the point is used to enter it with the cutting edge upwards. The deeper part of the wound is enlarged to 1–2 mm. in length. Pressure with an iris repositor on the posterior lip of the wound prolapses the iris. The presenting knuckle of iris is grasped with iris forceps and abscised. If the iris fails to prolapse the incision is enlarged to about 4 mm. in length with Castroviejo's wound-enlarging scissors, the peripheral part of the iris then being withdrawn by smooth iris forceps. The normal configuration of the pupil is restored by stroking the moistened cornea towards the wound with an iris repositor. This is found to be more effective than stroking towards the pupil although the latter method is more commonly used. In the few cases in which the pupil is not fully restored to normal configuration by this manoeuvre, the gentle application of an iris repositor in the lips of the wound or a jet of saline directed into the wound is sufficient to disengage the margins of the iridectomy.

In eight cases, all early in the series, a McLean suture was used. Haas and Scheie (1952) and Lewis (1964) advocated its routine use, but as we found no difference whether or not a McLean suture was used, we are inclined to agree with McDonald (1956) who believes it to be unnecessary provided the incision is small. In the later cases of this series, we also abandoned the use of conjunctival sutures because these appeared to contribute nothing to the safety or efficacy of the operation, the conjunctiva being simply stroked back into place.

Post-operative medication in the operating theatre consisted of antibiotic drops and in 60 per cent. of cases homatropine 1 per cent. Because one patient developed a severe rise in tension due to angle crowding by the iris after homatropine, only adrenaline bitartrate 1 per cent. is now used as a mydriatic. In many cases no mydriatic is used at all.

Complications (Table I).—In one eye a flat anterior chamber developed which persisted for 4 days; this complication occurred in spite of the use of a corneo-scleral suture. Five eyes had persistent subconjunctival fistulae; four of these had closed within 1 month and the fifth within 2 months; in none was the depth of the anterior chamber diminished. Two eyes developed posterior synechiae of small extent. Small operative hyphaemata were seen in five eyes; all had been absorbed within 24 hours.

As already mentioned, an angle-closure attack developed in one eye in spite of a patent iridectomy; it responded rapidly to miotic therapy, and no peripheral anterior iris adhesions formed as a result. Lowe (1964) warned of this danger, and estimated that one sixth of eyes with narrow angles are at risk from post-iridectomy angle crowding.

None of the complications listed in Table I led to a fall in visual acuity or to the formation of goniosynechiae.

TABLE I
COMPLICATIONS IN 103 EYES

Operative Complications	No. of Eyes
Flat anterior chamber	1
Persistent subconjunctival fistula	5
Posterior synechiae	2
Post-operative angle-closure	1
Hyphaema	5
	14
No complications	89
Total	103

TABLE II
CHANGES IN VISUAL ACUITY

Changes	No. of Eyes
Unchanged ..	100
Reduced ..	1
Improved ..	2
Total	103

Visual Acuity (Table II).—Of the one hundred cases in which visual acuity remained unchanged, only eleven had a Snellen assessment worse than 6/9. Of these, three had macular degeneration, three had lens opacities, four were amblyopic, and one had a branch retinal vein thrombosis.

The eye which is recorded as having reduced acuity post-operatively presented with lens opacities pre-operatively; the visual acuity recorded 6 months after operation was one line less than pre-operatively.

Both patients whose visual acuity improved had central lens opacities. The improvement in vision can be accounted for by the increased pupil size after the cessation of miotic therapy.

Discussion

Of the complications reported here, we believe only three to be potentially serious:

- (i) Loss of the anterior chamber.
- (ii) Posterior synechiae.
- (iii) Post-operative glaucoma.

There were no cases of infection, sympathetic ophthalmitis, or malignant glaucoma. No eye suffered impairment of visual acuity attributable to the procedure.

As mentioned earlier, the risks of conservative treatment of eyes which are subject to angle-closure glaucoma have been known for some time. The effectiveness of peripheral iridectomy in preventing attacks of angle-closure glaucoma has been confirmed by Barkan (1954), Lowe (1962), and Blaxter and Chatterjee (1960). These last authors especially examined in detail the indications for operation, but the details of all operative and immediate post-operative complications were not fully annotated in their series. Probably it is lack of sufficient information about their incidence and seriousness which deters some surgeons from performing what is in fact a very safe operation. It is perhaps not out of place for us to re-emphasize its safety, since the complications of sympathetic ophthalmitis, serious intra-ocular haemorrhage, and trauma to the lens have been reported in the past and are well recognized (Adams, 1955; Swan, 1959). It appears that they can be entirely avoided by correct operative technique.

Summary

103 eyes had prophylactic peripheral iridectomy performed. The complications are listed and are mostly of a minor nature. None of them led to a fall in visual acuity. It appears to be safer to perform a peripheral iridectomy on an eye at risk from angle-closure glaucoma than to attempt to maintain it on miotic therapy.

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