OPTICAL IRIDECTOMY, INDICATIONS, METHOD AND VALUE

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ONE attraction of Ophthalmic Surgery, a compensation for its fickleness, lies in the sight-giving operations, lens extraction, and optical iridectomy, which are more dramatic in their results than those say for chronic glaucoma which are but a brake on a progressive disease.

Since its inception by Wenzel in 1871,¹ different writers on optical iridectomy,^{3,4,9} have mentioned that results are not so good as the mechanics of the operation might suggest. I have been unable to find in the literature, however, any series of cases that stress this or show just how much benefit one may expect. The 35 cases summarised in this paper represent four years work by the surgeons of the Royal Westminster Ophthalmic Hospital. No out-patient notes are available before this time.

Indications

The cases in which operation is indicated must have a percipient retina and can be divided into two classes.

1. *Optical Obstruction* only, of the pupil by opacities of the cornea or lens, more rarely by keratoconus, and dislocation of the lens.

2. *Pupillary Deformation* where the pupil is deformed by synechiae.

- (a) Occlusio and seclusio pupillae with an intact lens form one group, and
- (b) Drawing up of the pupil to the section after lens extraction forms the other.

In group (a) secondary glaucoma may provide an additional indication for iridectomy. Group (b) is dealt with by iridotomy as a rule. In the four cases included an iridectomy proper was performed.

In Class I the opacity should be of a stationary nature. An exception to this may be made in ophthalmia neonatorum. Here it is customary to wait until the child is weaned to see how

much will absorb. If, however, it is very dense and extensive, the operation may be performed as early as two months of age to prevent the onset of nystagmus. This complication, unfortunately, usually arises in the first six months of life, and rarely after two years. Iridectomy is much better as a prophylactic than as a cure. Where the opacity is progressive, as in cases where a preliminary iridectomy is performed for senile cataract, the optical effect is negligible, and out of 72 such cases in the past four years, not one shows any visual improvement. The opacity should of choice, be small, dense, and not surrounded by a nebulous area whether lenticular or corneal. In the lens, only small, axially situated, lamellar (or "Coppock") cataracts with a vision of less than 6/18 are suitable as a rule. Anterior polar cataracts rarely interfere enough with vision; large lamellar cataracts occupy all but the periphery of the lens and require discission. Should no definite improvement in vision occur after a week's mydriasis, operation is contra-indicated. This test excludes cases with partly transparent opacities, insufficient clear cornea or lens, or defective retinæ. Lamellar cataracts that do not improve to 6/18 at least, should also be considered unsuitable.

The site of election for the coloboma is "down and in." This is alleged to be the area nearest to the visual axis. As the visual axis is in actuality 5° "up and in," this site has probably been chosen empirically, and for cosmetic reasons. Frequently, the clearest portion of cornea as determined by ophthalmoscopy of the details of the optic disc is in another quadrant. The coloboma is then sited preferentially behind this. Even when the only available clear area is behind the upper lid, the coloboma may still be of use as the lid may be tonically raised to obtain a little vision if the sight is bad in the other eye. The lid may even serve to cut down dazzling. Where both eyes are defective a tenotomy of the superior rectus may place the clear area opposite the palpebral fissure.¹⁰ In a lamellar cataract, the best situation may be found by rotating a pear shaped stop 2.5 × 1.5 mm. in front of the dilated pupil.⁴ More ingenious variants of the same principle are a contact glass with a transparent sector,⁶ and a piece of black paper with a sector cut out and made adherent to the cornea by grease.¹⁴ The inventor of the latter method corroborates his results so obtained by an eccentric mydriasis. Injection of 0.3 c.c. of a standard solution of adrenalin or m. ii of laevo-glaucon (against which are strict injunctions on the leaflet) under the conjunctiva near the limbus, will produce an initial, local dilatation of the pupil towards the injection, giving the same optical effect as a temporary coloboma.

Method

Class I.—There is a choice of three operations¹⁰.

- (1) Ectomia ex Iride cum Sphincterectomy.
- (2) Ectomia ex Iride Simplex.
- (3) Iridoto-Iridectomy.

In method (1) the coloboma should be narrow, continuous with the pupil, uncovering lens only and not the zonule. If its outer limit can be kept within the "collarette" and yet not be covered by the opacity so much the better. It is made by a keratome incision just inside the limbus, withdrawing the iris by traction directly on the pupil margin with forceps or an iris hook, and excising the iris with de Wecker's scissors held radially. Pre-operative miosis will shorten, and mydriasis lengthen the slit produced.

This operation is useful in the small central corneal opacities, but is specially indicated in lamellar cataracts and to increase the lens-free area of the pupil in congenital dislocation of the lens.

Method (2) is used in larger corneal opacities with a very dense centre and a less dense periphery. A small area of iris is withdrawn through a keratome wound with Hess's forceps from behind the clear area of cornea and excised, leaving the sphincter intact. The dense central area obviates uniocular diplopia.

Method (3) is employed where a small sickle-shaped area of cornea alone remains clear. Iridodialysis is produced by insertion of a narrow keratome near the centre of the corneal scar, the iris being seized about 1 mm. from the limbus, gradually drawn out with an oscillating movement and divided. This operation which is very similar to one devised by Mayou for adherent leucomata, has very little effect from the optical point of view, and its value is mainly therapeutic.¹⁰

These operations may be done under a local anaesthetic in the adult if cocaine is inserted frequently for 20 minutes, but are painful at moments of tension on the iris, and are more easily carried out under general anaesthesia.

Tattooing may be employed as an adjunct to optical iridectomy, and its probable efficacy in a given case estimated by application of black paper to correspond with the area to be tattooed.⁸ It is extremely rare for anything but a cosmetic effect to be produced.

Class II A.—The problem here is to remove the iris without producing a traumatic cataract. It has been suggested with this danger in mind that the iridectomy be made at "12 o'clock" where it would assist a subsequent cataract extraction.⁵ Apart from adherent leucomata where the method of Mayou¹³ is indicated, there are three methods available.

(1) Iridorrhesis (Desmarres) consists of tearing away the iris near the pupillary margin with forceps, and, if possible, excising it. Margennis¹² describes a good result from this method. As the iris is friable it is difficult to get a good purchase on it, and in addition the pigment layers may remain adherent to the lens. When the iris is "bombé," it is the flattest and apparently most suitable areas that suffer from this disadvantage. Where the bulging forward of the iris is very marked, Fuchs' transfixion operation may have to be done to render an iridectomy feasible.⁷

(2) The method ascribed by Grimsdale to Brudenell Carter.⁸ This requires insertion of Carter's scissors through a keratome wound opening the blades flat against the iris, and snipping off the bulge rising between them. Two satisfactory cases are described by this author.

(3) Where the lens may be cataractous and shrunken as in old "sympathising" eyes, a conjunctival flap and keratome incision may be made as for anterior sclerotomy "up and out." The sharp pointed blade of de Wecker's original scissors is then introduced through this, pushed through and behind the iris and across the face of the lens. The blunt-ended blade is in the anterior chamber, and when the instrument is closed an oblique slit in the iris is produced. Case No. 30 was dealt with in this way producing an adequate pupil. The lens remains to be dealt with.

Group II B.—Iridectomy should not be attempted for a year after the lens extraction, when uveal inflammation has subsided, as shown by absence of endothelial oedema of the cornea.

An incision is made at "six o'clock" just inside the limbus with a Taylor's knife. This is passed vertically upwards about 2 mm. across the anterior chamber, then through the iris and up behind it into the drawn up pupil. The knife is withdrawn and a malleable hook passed along its track, until it engages in the pupil margin which is drawn outside the wound, and the iris divided with de Wecker's scissors. For convenience in manoeuvring the hook, the shaft should be bent at right angles before insertion as suggested by Sir Richard Cruise. A large vertical opening is thus produced, but even this may contract down, and the operation also suffers in common with iridotomy the disadvantage of unabsorbed haemorrhage into the vitreous, hernia through the new pupil, and opacities into the vitreous behind from preceding inflammation.

Results

To assess results, cases must be divided into two classes. Operations of "Election," where vision in the other eye is good, and operations of "Necessity" where vision in both eyes is poor.

My thanks are due to Mr. Grimsdale and Mr. McMullen for revising this paper, and to the surgeons of the Royal Westminster Ophthalmic Hospital for permission to publish these cases.

O.I.=Optical Iridectomy

7. Aged 47 years. Cracker maker. Silver nitrate and nitric acid mixture boiled up into his eyes, 1 year ago.
 Rt. Symblepharon, dense corneal opacity below and axially. Counts fingers 1 ft. O.I. Not improved.
 Lt. Dense opacities below and to temporal side, cornea clear above. C.F. 2 ft. O.I. Not improved.
8. Aged 52 years. Civil servant. Ten years failure of sight.
 Lt. Lamellar cataract. 3/60. O.I. 6/24.
 Rt. " " 6/24. O.I. 6/36.
9. Aged 26 years. Gardener. Corneal ulcer in third week of smallpox.
 Rt. Normal. 6/6.
 Lt. Dense leucoma. Good projection. O.I. Not improved.
10. Aged 58 years. Farmer. Recurrent corneal ulceration.
 Rt. Vascularised nebula. H.M. O.I. 6/24.
 Lt. " but less dense nebula. H.M. O.I. 6/60.
11. Aged 32 years. Clerk. Four months corneal ulceration.
 Lt. Normal 6/5.
 Rt. Dense leucoma. C.F. at 1 ft. O.I. C.F. at 18 ins. No improvement.
12. Actor. Corneal ulcer requiring peritomy 2 years ago.
 Lt. Normal 6/9.
 Rt. Dense vascularised nebula. C.F. at 2½ ft. O.I. "Diplopia and haloes round lights." C.F. at 1½ ft., but "feels that sight is improved."

Class II_a

13. Aged 40 years. Jeweller. Recurrent iridocyclitis.
 Rt. Partial seclasio pupillae. 6/24. O.I.
 Lt. Seclasio and oclusio pupillae. Bare P.L. } Not improved.
14. Aged 66 years. Teacher. Scleritis 45 years ago.
 Rt. Corneal opacities and post synechiae < 6/60.
 Lt. " " " " " 6/36. O.I. 6/24 later fell to 6/60.
15. Aged 56 years. Porter. Iridocyclitis 20 years.
 Rt. A little debris in pupil. 6/9.
 Lt. Oclusio pupillae. P.L. O.I. Not improved.
16. Aged ? years. Housework. Two years recurrent iritis.
 Lt. Post. synechiae. 6/9.
 Rt. " " 6/60. O.I. Not improved.
17. Aged 38 years. Tuberculous iridocyclitis and phthisis 8 years.
 Lt. Exudate and new blood vessels in pupil. Poor projection. O.I. Not improved.
 Rt. " " " " " " " " Good projection. O.I. Not improved.
18. Aged 48 years. School teacher. Eight years ago tuberculous iridocyclitis and corneal ulceration.
 Lt. Dense leucoma, post. synechiae. Poor projection, O.I. Not improved—later excised.
 Rt. Dense leucoma, post. synechiae. Good projection. O.I. < 6/60.
 "But able to get about which she has not done for years. Very grateful."

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Class IIb

Complicated after cataract

32. Aged 66 years. Housework. Old glaucoma and lens extraction. July, '31.
 Lt. Anophthalmos.
 Rt. Pupil drawn up and capsule unchanged by capsulotomy P.L. October, 1929. Iridectomy, leaving a fair sized pupil, C.F. at 1 metre. Pupil contracted, March, 1930. Iridectomy. No elasticity in iris at all, tore on insertion of hook leaving a vertical slit that soon closed. Doubtful P.L.
33. Aged 49 years. Carpenter. Tuberculous iridocyclitis 2 years.
 Rt. Post. synechia and cataract. H.M. (Active iridocyclitis.)
 Lt. " " " " C.F. at 9 ins. June, 1931. Lens extraction. Pupil drawn up to section. V.=P.L. August, 1931. Iridectomy, V=6/60. "Patient can get about by himself. Had previously been signed up as a blind person at another hospital and told nothing could be done."
34. Aged 48 years. Violinist. Recurrent iritis, iridectomy 6 years ago.
 Rt. Post. synechia, lens opacities. C.F.
 Lt. " " Pupil blocked with exudate, opaque lens. H.M. March, 1931. Synechia divided. Lens extraction. Pupil subsequently pulled up. = C.F. at 3 ft. February, 1932. Iridectomy. Good pupil. 6/36 and J.14. Retinal and choroidal haemorrhages. Much improved visually.
35. Aged 76. Housework. Rt. lens extraction. January, 1931. Delirious after operation. Prolapse.
 Lt. Lens opacities. 6/18 later fell to 6/60.
 Rt. Old prolapse, pupil drawn up and contains exudate. November, 1931. Iridectomy. Good opening made but blood stained vitreous blocks it, and it is contracting. Good projection.

In all cases quoted above the vision is the best obtainable with correction.

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Since writing this paper another article on the subject has come to my notice.¹⁵ The author, Roche, quotes cases in which the cornea cleared to a surprising extent, and the artificial coloboma was a liability to the patient by reason of the dazzling produced. This occurred although the operation was technically perfect when originally performed. He emphasises that although an eye might see better with an iridectomy, it is the patient's ultimate benefit and not this alone that should be considered in deciding for or against operation.