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The following papers were also read:

**Tumours of the Eyelids and Epibulbar Region:
Results of Radiation Treatment**

Dr Manuel Lederman
(Royal Marsden Hospital,
Fulham Road, London SW3 6JJ)

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- Lederman M
(1976) *British Journal of Ophthalmology* (in press)

Oculocutaneous Melanoma

Dr A Levene
(Royal Marsden Hospital,
Fulham Road, London SW3 6JJ)

Meeting 13 May 1976
at the Bristol Eye Hospital

Intraocular Implants

Mr N L Dallas
(Bristol Eye Hospital, Lower Maudlin Street,
Bristol, BS1 2LX)

**Comparison of Iris Clip Lens
Results with Plain Intracapsular Extraction**

Cataract surgery has now reached such a standard of excellence, with the introduction of the operating microscope and greatly improved suturing materials, that one may sit back and enquire whether any benefit has been passed on to the patient in the way of improved vision.

The majority of cataract patients are prescribed a spectacle correction, and a plastic lenticulus (now available under the National Health Service) represents an advance over the heavy, wide-angle glass which many patients still wear. Nevertheless, there remains a great difference between what the patient expects after his operation and what he eventually has to put up with.

The patients who are openly dissatisfied represent only the tip of the iceberg, and it needs a probing sociologist (such as we have in Mr John Hilbourne in Bristol) to expose the true disability and disappointment that many of the aphakes suffer with spectacle correction. These difficulties are well known, but ophthalmologists are inclined to gloss over them and remain unsympathetic.

There are only two ways of giving the patient an improved optical correction. These are contact lenses, which will be discussed briefly, and intraocular lenses. Intraocular lenses offer a better optical system than contact lenses in many ways, and the results of these will be discussed in detail.

If it can be shown that cataract extraction with the insertion of a clip lens has a rate of complications no higher than that of plain cataract surgery, will there be any doubt that this is the best operation for the patient?

The author would like to emphasize that all three methods of management should be considered. It is a matter of clinical judgment whether a patient has plain extraction with spectacles, extraction and contact lens or extraction and iris clip. That is what makes cataract surgery so interesting at the present time. It also gives one reason why fewer than three hundred acrylic implants have been carried out in this series over a twelve-year period.

Contact Lenses in Unilateral Aphakia

These may be effective in an appreciable percentage of cases. But the micro-lens in aphakia is heavy and tends to be unstable; may distort vision owing to the prismatic effect; may result in unacceptable aniseikonia; and creates difficult management problems.

The hydrophilic soft contact lens is a useful alternative: it is a comfortable visual aid which may be worn for prolonged periods; but visual acuity may be unacceptably low as compared with spectacle or micro-lens correction.

Many users of contact lenses in unilateral aphakia abandon their lens because of discomfort or diplopia, and orthoptic assessment does not predict success or failure.

Intraocular Acrylic Implants

The indications for the use of implants are cataract in the elderly, predominantly unioocular cataract, and unioocular cataract due to trauma. The iris clip implants commonly in use in Western Europe are the Binkhorst 4 and 3 loop, the Federov crossed loop, the iridocapsular and the Worst medallion. A posterior chamber lens (Pearce) has recently been introduced.

The selection of cases for the iris clip technique excludes eyes with myopic retinal degeneration, glaucoma and diabetic/hypertensive retinopathy.

Table 1

Results of plain cataract extraction (1967-71) in 268 eyes (185 patients)

	Eyes
6/12 (0.6) vision or better	180 (67%)
Endothelial corneal dystrophy	6 (2.2%)
Cystoid macular oedema	5 (1.8%)

Table 2

Results of use of iris clip lenses in 200 eyes (185 patients)

	Eyes
Good vision and acceptable surgical result	170
Complications:	
Corneal oedema (endothelial corneal dystrophy) ●	16 (2 localized)
Macular disturbance	12 (2 presumed)
Retinal detachment	5

● The majority of these occurred in early cases of unioocular 'complicated' cataract

Eyes with senile macular degeneration, however, are particularly suitable, as these patients tolerate aphakic lenses badly.

An attempt was made to compare a series of plain cataract extractions carried out between 1967 and 1971 (Table 1) with the author's series of iris clip implants over a ten-year period up to 1975 (Table 2). It was admitted that the comparison created difficulties because of selection in the latter group, all operated on by the author, against an unselected group in the hands of various registrars and house surgeons, and only one-third by the author. Nevertheless, for at least one postoperative complication, cystoid macular oedema (CME), the comparison may be valid. The causes of defective vision in my series were dry maculopathy (14), myopic degeneration (10), glaucoma (13), vascular (14) and diabetes (3). CME, corneal disturbance and retinal detachment are mentioned in Table 3.

Table 4 shows a trend towards improved surgical results, and in the most recent two-year period, 1974-6, in which 40 iris clip operations were performed, 28 eyes have 0.9 vision or better. CME occurred in one case only, and there have been no corneal disturbances. Four eyes have 0.1 vision or worse. It is suggested that careful selection of cases, and a continually improving technique, contribute to the lower rate of complications.

Cystoid Macular Oedema (CME)

The pathology is of two types: vitreous disturbance; and Irvine-Gass syndrome. Possible etiological factors in the Irvine-Gass syndrome include hypotony following section of the eye, the use of α -chymotrypsin and zonular

rupture, low-grade uveitis, the effect of the acrylic implant and finally the possible 'biotoxic' effect of aqueous humour.

The investigation of this complication is by visual acuity, the ophthalmoscopic appearance of the macula, fluorescein angiography of both posterior and anterior segments, and prostaglandin assay.

Postoperative macular oedema probably occurs in all aphakics to some extent. Jaffe has shown that four months after operation 14% of eyes show persistent macular leak with or without an implant. In the present series 12 eyes (6.3%) have shown persistent leak with cystoid degeneration. Some milder cases occurred which have recovered spontaneously. Treatment of this condition with steroids, either topical or systemic, has not been effective.

It will be interesting to study the incidence of CME in implants following extracapsular extraction. Binkhorst has already shown that the incidence is considerably reduced. Other authors (including the users of phakoemulsification) have agreed, but have stated that a subsequent capsulotomy is likely to nullify the 'safety' factor of the extracapsular technique.

Other Complications

Endothelial corneal dystrophy may occur in any eye which has been sectioned. It is more likely to occur in eyes with 'complicated' cataracts and where the endothelium has been damaged at the time of operation. Repeated 'touch' by one of the loops postoperatively may lead to localized endothelial corneal dystrophy (ECD). In other cases its cause is a matter of speculation.

Retinal detachment occurs equally frequently following plain extraction and iris clip implanta-

Table 3

Complications in cataract surgery

	Plain intracapsular (%)	Iris Clip (%)
Endothelial corneal dystrophy	2.2	7 ●
Maculopathy	1.8	6
Retinal detachment	2.2	3

● After exclusion of 'complicated' cases of cataract during the author's first two-year period: 4%

Table 4

Results of use of iris clip lenses (1966-75) in 192 eyes

	Total	Successful operation (%)	Unsuccessful operation
1966-68	48	34 (73%)	14
1968-70	44	40 (91%)	4
1970-72	60	56 (93%)	4
1972-74	40	38 (95%)	2
Total	192	168 (87.5%)	24

tion. It remains to be seen whether the extracapsular technique will 'protect' the retina and show a lower incidence of retinal tear and detachment.

Vascular complications such as arterial or venous occlusion occurred in 4 eyes (and in a slightly greater number in the unselected plain extractions). This must be expected as an occasional ocular complication in elderly patients.

Removal of 8 iris clip lenses has been carried out (all in earlier cases). Three lenses had dislocated, 2 patients had iris prolapse, 2 had updrawn pupils and one had persistent pain and keratitis. One of these eyes (in a 90-year-old) was subsequently lost due to gross infection.

What is the Future of Iris Clip Lenses?

The patient-satisfaction following successful implant surgery is striking. The absence of aniseikonia and the good binocular function contribute to this, and are superior to the results obtained with contact lenses. Only the incidence of macular oedema inhibits the wider use of these clip lenses. There is now strong evidence, however, that an extracapsular technique confers immunity to the macular region. Future cataract management may be recommended as either (1) extracapsular extraction and primary iridocapsular implant; or (2) phakoemulsification followed by elective implant, contact lens trial in younger patients, with secondary implant if contact lenses are not successful.

Mr V J Marmion

(Bristol Eye Hospital, Lower Maudlin Street, Bristol, BS1 2LX)

Cystoid Macular Oedema

One avenue of the continuous drive towards perfection in cataract surgery is the development of the intraocular acrylic lens by Ridley in 1952. The problems arising in this refinement have been contained by surgical technique and controlled by adept medical care with steroids and other preparations. One complication so far eluding control is that of aphakic cystoid oedema. First described by Irvine (1953), the year after intraocular lenses were reported, it was subsequently reported by Nicholls (1954), Chandler (1954), Gartner (1964), and Tolentino & Schepens (1965); and Gass & Norton (1966) clarified the subject and gave clear angiographic criteria for the diagnosis. Subsequent reports, particularly that of Maumenee (1967), have drawn attention to the role of the vitreous. It is, however, clear from the reports of

Satake (1971), Hitchins, Chisholm & Bird (1974), Gass & Norton (1969) and Hitchins and Chisholm (1975), that macular oedema is a transient episode in about 40% of cataract extractions. All authors seem to cite local vitreous changes and inflammation, and systemic problems, hypertension and diabetes, as basic precursors.

The original syndrome, however, was that of oedema occurring late after an initial period of recovery with normal vision. It occurred between four weeks and five years after the cataract extraction and was associated with a reduction in the visual acuity, which subsequently recovered. An incidence rate of between 2 and 2½% was the accepted norm and our review of 750 cases of classical cataract extraction gave a rate of 2.1%. Recovery of the vision may be, in part, responsible for the low reported incidence of bilaterality. François, De Laey & Verbraeken (1972) have reported a high incidence of bilaterality. Personal experience would tend to support this observation. The same report has suggested adrenaline as a possible contributory cause in addition to the usual ones of incarceration of the vitreous and late rupture of the hyaloid face. Inflammatory changes have been difficult to substantiate.

The role of macular traction is unclear. Those cases which show oedema in this situation fall into the syndrome of Irvine and Gass. Those without oedema but with definite cystoid changes are classified as Jaffe's syndrome (Jaffe 1967), which is divisible into three stages and is regarded as a relatively rare occurrence in classical aphakia (Bonnet 1973). The incidence of cystoid oedema in pseudophakia is variously reported as 5% by Pearce (1972) and 12% by Binkhorst and Leonard (1967) and Jardine & Sandford-Smith (1974). A significant feature of the visual change is the greater degree of loss and the failure to recover as fully. The incidence of micropsia and changes on the Amsler chart is considerably higher as in Jaffe's syndrome.

The presence of an implant may provide the nidus for the vitreal changes leading to posterior hyaloid detachment with traction, and accounts for the greater degree of visual loss. The fine retinal fold and vitreous traction band and, later, a preretinal membrane, can be identified more readily with the Goldmann contact lens and the Hruby lens. The use of intravenous fluorescein at this stage of the examination is more revealing than an attempted angiography with a camera.

A differentiation between the Irvine-Gass and Jaffe types is important, as the recovery of visual acuity is better in the first than in the second type. Personal observations suggest that in the Irvine-Gass type cystoid change accounts for the majority of cases in classical aphakia with, perhaps, 1% of the Jaffe type. In pseudophakia, however, the