

Extracapsular Cataract Surgery with and without Intraocular Lens Implantation in Fuchs' Heterochromic Uveitis

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Summary

The results of extracapsular cataract extraction, with or without posterior chamber intraocular lens (IOL) implantation, in Fuchs Heterochromic Uveitis, are reported. Twenty-nine patients underwent 30 operations. Twenty-two patients (73%) obtained a visual acuity of 6/12 or better. Post-operative uveitis or glaucoma were encountered in 13 eyes, including 11 of 20 eyes with IOL implantation (55%), and two of ten eyes without IOL implantation (20%). IOL implantation is a significant additional factor in cataract surgery in patients with FHU. Preoperative risk factors include severe iris atrophy, secondary glaucoma, and severe abnormalities of iris vasculature. IOL implantation is not recommended in these eyes. The routine post-operative use of anti-glaucoma medication is recommended. Long-term postoperative follow-up is important.

Fuchs' Heterochromic Uveitis (FHU) is a chronic, indolent process of unknown aetiology, causing complicated cataract, and frequently, glaucoma.¹ Typical features include widespread fine, stellate keratic precipitates, minimal cellular reaction in the anterior chamber, posterior chamber and anterior vitreous, iris atrophy affecting all layers (causing heterochromia when unilateral), and vascular anomalies of the iris stroma and anterior chamber angle.²

The cataract is typically posterior subcapsular and may be rapidly progressive. It is probably universal in FHU.³ The question of cataract surgery in FHU has been addressed in the past, mainly anecdotally,^{1,4,5} but series and selected cases have been reported,^{3,6-10} all involving intracapsular cataract extraction (ICCE). Only recently has the question of intraocular lens (IOL) implantation been addressed^{11,12} and both reports deal with iris-

clip or iridocapsular-fixation IOLs. There is no previous study on modern extracapsular cataract extraction (ECCE) with posterior chamber IOL implantation. This paper presents a series of patients undergoing ECCE, with or without posterior chamber IOL implantation and discusses the implications of this form of surgery in FHU.

Patients and Methods

From August 1987, all seventeen NHS patients at the Royal Eye Hospital, Manchester known to have a diagnosis of FHU, and undergoing cataract surgery, were included in the survey. All patients were seen preoperatively and were followed up post-operatively by the author. Twelve other patients were identified by a search of operating theatre records for patients undergoing cataract surgery between the ages of 30 and 60 years, since November 1983, and were sub-

sequently reviewed by the author. Two other patients with FHU underwent ECCE but have been excluded from this study as the surgery was combined with penetrating keratoplasty, and trabeculectomy, respectively.

All patients were diagnosed according to the currently accepted criteria for FHU.² Three patients had bilateral disease. Two of these underwent bilateral cataract surgery, one patient having intracapsular cataract extraction on one side. The degree of preoperative iris atrophy and the state of the iris vasculature were noted, as was the preoperative intraocular pressure (IOP). Vitreous clarity was estimated if possible. Any surgical events were noted, and postoperative observation included an estimation of any uveitic response to surgery, regular IOP check, and observation of vitreous clarity.

The study involved nine surgeons. All patients underwent ECCE or endocapsular cataract extraction through a peripheral corneal section, and no iridectomy was performed. Posterior chamber IOL implantation was performed at the discretion of the surgeon. Postoperative follow-up ranges from five months to five and a half years with a mean of 20.2 months, and is continuing.

Results

The mean age at presentation to the ophthalmologist was 40.6 years, with a range of 21–65 years. The mean age at surgery was 45.4 years, with a range of 27–72 years. Fourteen patients (48.2%) were male, and 15 (51.8%) female. The left eye was operated on in 17 cases, and the right in 13, one patient undergoing bilateral surgery.

Preoperatively, all patients were noted to have a degree of iris atrophy, this finding being necessary for the diagnosis of FHU. In five patients this was marked. Four patients used topical treatment for glaucoma. Two others had had at least one recorded reading of significantly raised IOP but were not treated. No patient had had previous ocular surgery.

Ten eyes (33.3%) underwent ECCE or endocapsular cataract extraction without IOL implantation. A posterior chamber IOL was implanted in 20 eyes (66.7%). Of these, 13 were three-piece IOLs and seven were one-

piece polymethylmethacrylate (PMMA). At surgery, peroperative hyphaema was noted in 15 eyes (50%). This was characteristically small, occurring soon after paracentesis from the anterior chamber angle, but in three patients was more marked and involved vessels on the anterior iris surface. In only one case was there a hyphaema present on the first postoperative day.

Surgical complications were encountered in two patients. In one, capsular dehiscence occurred during cortex aspiration. The capsule was then removed without vitreous loss, and no IOL was implanted (though implantation was intended preoperatively). The postoperative course was uneventful. In the second, despite sectorial zonular rupture, a posterior chamber IOL was inserted. In the first postoperative year, visual acuity deteriorated from 6/9 to Hand Movements owing to progressive vitreous opacification. Ultrasonography showed a flat retina and vitrectomy was planned. At surgery two months later a total retinal detachment was apparent. Encirclement and internal tamponade was unsuccessful and periretinal fibrosis rendered further surgery untenable.

Postoperatively, a severe anterior uveitis was observed in five eyes (16.7%). All five affected eyes had IOL implantation, four with a three-piece IOL and one with one-piece PMMA. In three of these, the inflammation settled after intensive topical steroid therapy. In the other two it was more persistent and systemic steroid treatment was required. Severe iris atrophy and secondary glaucoma had been noted in both cases. Case 6 underwent trabeculectomy four months after cataract surgery (prolonged uveitis had resulted in extensive peripheral anterior synechiae) and is now under control with topical antiglaucoma medication. Case 7 required trabeculectomy six months after cataract surgery. Eventual failure was followed by the insertion of a glaucoma drainage tube three years later and cyclocryotherapy was required further to this. The IOP is now controlled.

At some stage after surgery, the IOP was raised to above 30 mmHg in ten eyes (33.3%). In two cases this was linked to severe uveitis, but in eight eyes (26.6%) it occurred in the absence of inflammation. The IOP rise

Table I Final Visual Acuity for patients with IOL compared to those with contact lens (CL)

Visual Acuity	No. with IOL	(% cumulative)	No. with CL	(% cumulative)
6/5-6/6	6	(30)	3	(30)
6/9-6/12	8	(70)	5	(80)
6/18-6/24	3	(85)	2	(100)
6/36 or worse	3	(100)	0	
Totals	20		10	

occurred as early as one to two weeks (four eyes), or as late as ten months after surgery. In five eyes the IOP rise was transient, but five patients still require treatment.

Significant vitreous opacification was noted in 15 eyes (50%) postoperatively and was severe in nine. Only two of these had significant postoperative uveitis. Eleven patients had IOLs *in situ* and four did not.

The final visual acuities for those with IOL and those with contact lens are compared in Table I. The main reasons for imperfect visual acuity were vitreous opacification and debris deposition on the IOL (a frequent problem though improving spontaneously over a period of months). One patient lost central vision because of glaucomatous field loss, and one from retinal detachment.

Table II shows the results of surgery for those patients with preoperative glaucoma or severe iris atrophy. Table III compares postoperative complications for those patients with and without an IOL. No patient developed corneal oedema or a pupillary membrane.

Discussion

Conflicting reports on the results of cataract surgery in FHU have made decision-making difficult, especially when addressing the question of IOL implantation in a young population. The first reports were anecdotal.

Kimura¹ in 1955 felt that intracapsular surgery provided no problems, and Franceschetti⁴ claimed that 'the prognosis for cataract extraction in complicated heterochromia is excellent—I would say even better than in normal eyes'. Duke-Elder⁵ summed up current opinion in 1966 in stating that 'extraction is easy and the operative prognosis is good'.

The first sign of dissent came from Ward and Ham⁶ who selected nine complicated cases of cataract surgery in FHU to illustrate the potential problems, which included persistent hyphaema, glaucoma and vitreous opacification. Norn⁷ reported a retrospective series of 23 cases of ICCE and found that eleven (48%) had glaucoma, of which four had required enucleation. In contrast, Smith and O'Connor⁸ studied a series of 29 cases of ICCE or ECCE and revealed few complications, concluding that 'the usual criteria for the elective removal of cataractous lenses should also apply to patients with Fuchs' syndrome'. Jain *et al.*⁹ observing a series of 21 cases, noted a tendency to severe postoperative uveitis. Liesegang³ in reporting a series of 17 ICCE cases, added postoperative corneal oedema as a complication, and Regenbogen and Naveh-Floman¹⁰ identified the problem of exacerbation of glaucoma following cataract surgery.

The question of intraocular lens implan-

Table II Outcome for patients with preoperative severe iris atrophy or treated glaucoma

Case No.	Preop. Iris Atrophy	Preop. Glaucoma	IOL?	Hyphaema	Postop. Uveitis	Postop. Glaucoma	Vitreous Opacities	VA
3	++	-	Yes	+	-	Yes	+	6/6
6	+++	Yes	Yes	+++	++	Yes	+	6/9
7	++	Yes	Yes	+++	+++	Yes	+	6/60
16	++	-	Yes	+	-	-	-	6/6
20	++	Yes	No	+	-	Yes	++	6/9
21	+	Yes	Yes	-	-	-	+++	6/24

Table III Postoperative complications in patients with and without IOL's

Complication	No. with IOL	(% of those with IOL)	No. without IOL	(% of those without IOL)
Severe uveitis	5	(25)	0	(0)
Glaucoma	8	(40)	2	(20)
Vitreous opacification	11	(55)	4	(40)

tation was briefly addressed by Mooney and O'Connor in 1980 when ten cases of ECCE with Binkhorst iridocapsular-fixation IOL and one ICCE with iris-clip lens, were reported. After an unidentified interval of postoperative care, it was concluded that IOLs were well tolerated. In 1982 Mills and Rosen¹² reported a prospective series of eight patients undergoing ICCE with Binkhorst four-loop iris-clip IOL, and after follow-up of up to 2.5 years, identified pupillary membrane formation as a feature in four cases, in addition to three cases of glaucoma. The results of ECCE with posterior chamber IOL implantation have not previously been reported.

This survey shows that the results of cataract surgery in FHU are generally good in the short term, and that in the majority of cases the visual acuity is acceptable. The study has however identified significant complications in a number of patients and several features worthy of discussion.

(i) Peroperative haemorrhage

Peroperative intraocular haemorrhage was noted in 50% of eyes. Such bleeding is clearly a response to sudden reduction in IOP, and was identified as a pathognomonic sign of FHU by Amsler.¹³ It may commence at any time within the first few minutes of surgery and occurs independently of any iris manipulation. It is typically located in the anterior chamber angle, is often extremely subtle and may easily be overlooked. The author feels that the reported rate above is too low. Haemorrhage has been observed in all ten cataract operations performed or witnessed by him, and is probably universal and pathognomonic of FHU.

In three patients, peroperative haemorrhage was marked and occurred from both anterior chamber angle and iris stroma. In all three cases, postoperative glaucoma ensued,

and in the two most marked, severe postoperative uveitis and glaucoma was followed by trabeculectomy. All three cases had marked iris atrophy noted preoperatively. Although peroperative bleeding is in itself no prognostic indicator, it is probable that substantial haemorrhage is a warning of postoperative problems. One patient had a single episode of spontaneous hyphaema preoperatively. This was not associated with a poor outcome from surgery.

(ii) Postoperative uveitis

Severe postoperative uveitis following uneventful ECCE with or without IOL implantation is an occasional phenomenon even in those with no history of uveitis. In this series it affected 25% of 20 eyes implanted with IOLs, but none of the ten eyes without IOLs. Therefore in eyes with FHU, IOL implantation is an important factor in addition to surgery itself. In the two most severely affected eyes, preoperative severe iris atrophy and glaucoma were present. These two phenomena seem to be good markers for postoperative uveitis, as does peroperative brisk haemorrhage. The decision to implant an IOL should take these factors into account.

Foster *et al.*¹⁴ discuss the special problems of cataract surgery in patients with uveitis, and conclude that all inflammation should be eliminated for a period before surgery. Although topical steroid treatment is not generally considered beneficial in FHU, it may prove useful in the preoperative period, in reducing the incidence and severity of postoperative uveitis.

(iii) Glaucoma

In this series, ten patients had a significant rise in IOP at some stage postoperatively. This included 40% of 20 eyes with IOLs and 20% of ten without IOL implantation. The IOP rise usually occurred within a few weeks of

surgery whilst still using topical steroids. Clearly, in the absence of uveitis, steroid response must be considered a possible cause, though this phenomenon has not previously been described in FHU.

Modern ECCE with IOL implantation is not generally considered to be deleterious in medically controlled open-angle glaucoma. Indeed, it has been found that the IOP may be better controlled for a significant period following surgery.¹⁵ Of the four patients in this study who were using topical treatment for glaucoma preoperatively, two became uncontrolled, requiring glaucoma surgery, one remained controlled on the same topical medication, and one improved, being able to stop Timolol treatment.

A rise in intraocular pressure following cataract surgery is common in FHU and though often lasting for only a few weeks, levels may be very high. The author now uses topical anti-glaucoma medication routinely for several weeks following cataract surgery in FHU. Preoperative glaucoma should be noted as a marker of severe disease and surgery should be undertaken with care.

(iv) Vitreous opacification

Vitreous opacification of variable degree is common at all stages of FHU and was identified in several patients preoperatively, but was difficult to quantify through the lens opacities. Postoperatively, significant opacification was noted in 50% of patients. There was no association with either postoperative uveitis or glaucoma. In only one patient was surgery followed by definite progressive opacification. There was no significant difference in vitreous clarity between those patients with and without IOLs.

(v) Intraocular lens implantation

Although previous studies^{11,12} have found a generally good outcome from iris clip IOL implantation in FHU over a short postoperative period, the author's observations of such eyes over a longer period is rather less satisfactory. Dense pupillary membrane formation, UGH syndrome and rubeotic glaucoma are not uncommon. IOL implantation must be approached with care, especially in a young population. This study demonstrates a

significant increase in the incidence of postoperative uveitis and glaucoma following IOL implantation. The implantation of an IOL cannot be assumed to be permissible in every case, and stringent preoperative selection may be necessary. The use of one-piece PMMA IOLs is advisable in uveitis patients¹⁴ and should be the rule for FHU. The advent of surface-modified IOLs will be observed with interest.

Conclusions

ECCE with IOL implantation in FHU can produce excellent results, yet significant complications may be encountered. The preoperative identification of problem markers is important, and IOL implantation in high-risk eyes should be avoided. The following are considered risk markers:

- (1) Severe iris atrophy with substantial transillumination.
- (2) Severe abnormalities of iris vasculature.
- (3) Glaucoma.

The following have not been associated with postoperative problems:

- (1) Previous episodes of spontaneous hyphaema.
- (2) Busacca or Koeppe nodules.
- (3) Age or duration of disease.

The ideal preoperative preparation may include a period of topical steroid therapy. As with other forms of uveitis¹⁴ endocapsular IOL fixation is sensible, as is the use of one-piece PMMA IOLs. The routine use of preoperative subconjunctival steroid is to be recommended.

Postoperatively, frequent observation is required including measurement of IOP. The author now uses a topical beta-blocker routinely, in the absence of contraindications. Long-term follow-up is advisable for all patients with Fuchs' heterochromic uveitis.

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