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Clinical features and outcomes of phacoemulsification in Fuchs' Heterochromic Uveitis in a tertiary care hospital in South India

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Abstract:
Aim: *To study clinical features and outcomes of phacoemulsification with PCIOL in patients with Fuchs' heterochromic uveitis (FHU).*
Materials & Methods*: In our non randomised retrospective case series, we studied the records of 17 patients with FHU who underwent surgery between January 2015 till December 2019 at Sankara eye Hospital, Bangalore. We analysed parameters like pre operative findings,post operative visual acuity, complication rate and management.*
Results: *There were 9 males and 8 females with a mean age of 35.29. Preoperatively iris heterochromia was seen in 8 eyes, nodules in 3, 2 had moth-eaten appearance. There was no anterior chamber reaction in most eyes. Stellate keratic precipitates were observed in all 17 eyes and anterior vitreous cells in 8 eyes. Increased IOP was noted in only one eye. Post operative visual acuity of all patients was >=20/40. One patient had developed hyphema post operatively, 3 cases of raised post operative IOP, all of which received topical anti-glaucoma medications.. 3 patients required systemic steroids, tablet prednisolone was started for 2 and given for a week, whereas one patient required to be kept on oral steroids for 4 months . There was no evidence of macular edema in any eye. All patient were otherwise treated with topical steroids , NSAIDs and antibiotics. Late postoperative complications after 6 months included visually significant posterior capsule opacification in 3 eyes. Postoperative mean follow up period was 18.47 weeks.*
Conclusion: *Uneventful cataract surgery with PC IOL implantation in cases with Fuchs' heterochromic uveitis resulted in excellent visual outcomes.. Postoperative inflammation was minimal and few developed significant complications.*
Key words: Cataract surgery, Fuchs' Uveitis, Phacoemulsification, IOL

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I. Introduction

Fuchs' heterochromic uveitis(FHU) is a low grade chronic anterior uveitis typified by iris heterochromia. There is no systemic disease associated and the uveitis occurs usually with few symptoms. The uveitis may manifest at any age, but mostly in those between ages 20 and 40.[1] It is an uncommon condition, with estimated incidence of 1.5%[2] to 4.5%[3] of the referred uveitis cases. However, cataract is an almost universal association,[4,5] which leads to significant vision loss, along with the early age at presentation and predominantly unilateral nature. Fuchs' heterochromic uveitis is reported to have better cataract surgery outcomes than other uveitic cataracts.[30] . In this study we evaluate and present the findings on patients with FHU undergoing phacoemulsification surgery with an intraocular lens (IOL) implantation.

II. Materials and Methods

In our non randomised retrospective case series, we studied the records of patients with FHU who underwent surgery between January 2015 till December 2019 at Sankara eye Hospital, Bangalore**.** Out of 160 patients who were diagnosed of FHU, 25 had developed cataract, we analysed 17 patients (17 eyes) with FHU who underwent cataract extraction at our hospital. The diagnosis of FHU was made by using the criteria of Kimura et al, [6] which comprises of: (1) small, diffusely distributed, white keratic precipitates(KPs); (2) reaction in anterior chamber; (3) iris atrophy with or without heterochromia; (4) few cells in vitreous cavity; and (5) absence of any posterior synechiae. Every patient otherwise underwent a detailed examination of vision , fundus and intraocular pressure as well.

Patients having uneventful phacoemulsification with PC IOL and a minimum 1 month follow-up were selected. Patients with history of trauma and other causes of uveitis were excluded.

Preoperatively, all patients had received topical prednisolone 1% eye drops 4 times/day for one week. Treatment for raised pre operative IOP was started with combination drops of timolol 0.5% and brimonidine

0.2% eye drops for one patient twice a day. Other preoperative protocols and assessment were similar to that for standard cataract patients. Particular attention was paid to the intraocular pressure, anterior and posterior chamber

inflammation and degree of iris atrophy.

All patients were given peribulbar anesthesia , underwent phacoemulsification via the temporal section with implantation of an aspheric hydrophobic posterior chamber IOL in the bag, and no iridectomy was performed. Postoperatively patient was followed up on the day of surgery, end of week 1,2,4 and thereafter follow up was left to the discretion of the operating surgeon. Post op regimen followed was prednisolone one percent eye drops in a weekly tapering regimen starting from 6 times a day/week then 4 times/day per week , then 3,2,1 per day/ per week respectively with moxifloxacin eye drops given 4 times a day for 2 weeks along with bromfenac/nepafenac eye drops 2 times a day for 2 months.

Postoperative follow-up ranged from 4 weeks to 50 weeks with a mean of 18.47 weeks.

III. Results

The mean age at presentation to the ophthalmologist was 35.29 years, with a range of 21-48 years. Nine patients (52.94%) were men and eight (47.06%) were women. The right eye was operated on in 11/17 cases and remaining 6/17 on left. All patients underwent an uneventful surgery.

Presentation and clinical features

The typical presentation in most patients was Fuchs' classic triad of cataract, iris heterochromia, and keratic precipitates.[7] Table 1 shows the patients' preoperative data.

All our patients came with unilateral symptoms and signs. Most presented with significant unilateral visual loss with no history of pain or redness which is typically present in other uveitic entities. All eyes had brown irises and loss of the iris collarette. Iris heterochromia was seen in 8 eyes and iris nodules in 3. 2 eyes had severe iris atrophy leading to the classic moth-eaten appearance. There was no anterior chamber reaction in most eyes (Table 1). Small stellate white keratic precipitates diffusely scattered over the corneal endothelium were observed in all 17 eyes and occasional anterior vitreous cells in 8 eyes. Increased IOP was noted in only one eye. No eye had evidence of posterior synechiae or of hyphema.

Table 1. Preoperative patient characteristics.

	Pre operative findings	Number of eyes
1.	Visual acuity	
a.	<6/60	8
b.	6/60 to 6/18	6
c.	>=6/12	3
2.	Keratic Precipitates	17
3.	Severe iris atrophy(moth eaten appearance)	2
4.	Iris Nodules	3
5.	Iris Heterochromia	8
6.	Anterior chamber reaction	
	a. No reaction	11
	b. Mild reaction(+1)	6
7.	Cataract	
a.	Posterior subcapsular	4
b.	Total/Mature cataract	13
8.	Vitreous cells	8
9.	Raised IOP	1

Intraoperative

Amsler's sign was not seen in any case. There were no posterior capsule rents, and all IOLs were implanted in the capsular bag. All eyes received an aspheric acrylic hydrophobic IOL.

Follow-up

Postoperative follow-up ranged from 4 weeks to 50 weeks with a mean of 18.47 weeks. Patient was followed up on the day of surgery, then end of week 1, 2, 4 and thereafter follow up was left to the discretion of the operating surgeon

Postoperative Course (Table 2)

Post operative regimen followed was prednisolone one percent eye drops in a weekly tapering regimen upto 6 weeks with moxifloxacin eye drops 4 times a day for 2 weeks along with bromfenac/nepafenac eye drops 2 times a day for 2 months.

One patient had developed hyphema post operatively and was treated with 6 weeks of steroids along with combination of timolol 0.5% and brimonidine 0.2% eye drops. 3 cases of raised post operative IOP were treated with of timolol 0.5% and brimonidine 0.2% eye drops twice a day dosage for one month. Three patients required systemic steroids, tablet prednisolone was started for 2 and given for a week, whereas one patient required to be kept on oral steroids for 4 months and the inflammation resolved with hourly topical prednisolone alone in all eyes within 3 weeks after surgery. There was no evidence of macular edema in any eye. Late postoperative complications after 6 months included visually significant posterior capsule opacification (PCO) requiring a neodymium:YAG laser capsulotomy in 3 eyes . No complications were observed after the capsulotomy.

Table 2: Post Operative Finding

Post op finding		**Eyes**
1.	High IOP	4
2.	Vitritis	2
3.	Hyphema	1
4.	Uveitis	4
5.	PCO	4
6.	Vision	
a.	20/20	14
b.	20/30	1
c.	20/40	2

Table 3: Post operative treatment

	Treatment given	**Patients**
1.	Topical Steroid plus antibiotic plus NSAID	17
2.	Systemic Steroids	4
3.	Topical Anti-glaucoma	4

IV. Discussion

Fuchs' heterochromic iridocyclitis usually is incidentally diagnosed on routine examination and is often seen in the quiet eye. The two most common presenting features are cataract and vitreous floaters. [8]

Cataract in patients with FHU is frequently noted, with a reported incidence from 15% to 75%,[9,10] with larger number of studies reporting 50%.[11–13] . The typical age at presentation for cataract in these patients is 40 years or older.[14] In our study, the mean age at presentation was 35.29 years.

Contrasting reports of the results of surgery in such patients make treatment decisions tedious, particularly when IOL implantation is to be done. Certain researchers report an excellent prognosis,[15–19] while few others have observed numerous complications.[20,21]

Preoperative treatment with systemic steroids may lessen chances of postoperative uveitis as has been suggested in other uveitis syndromes.[14] We had started topical steroids for every patient one week before surgery and systemic steroid was given to 8 (47.05%) patients. Although four eyes had raised IOP postoperatively, only one eye has shown a sustained rise requiring more treatment than was needed before the surgery. None of our patients had vitrectomy for vitreous opacities/floaters but cataract surgery combined with vitrectomy for vitreous opacities may lead to a better visual result.[22]

The visual outcomes in our study were excellent with all our patients (17/17) achieving a BCVA of 20/40 or better. Some patients(17/6%) had a vision of less than 20/20 probably owing to development of early PCO or vitreous floaters. Ram et al.[23] reported a vision of 20/40 or better in 82.8% of patients and in 100% in another study,[24] whereas Milazzo et al.[25] report satisfactory acuity in 76.6% of 93 patients. Javadi et al.,[26] reported in their study of 41 eyes , a visual acuity of 20/40 or better in all eyes. However, Ward and Hart[27] found notable complications after surgery including uveitis, vitreous hemorrhage, hyphema, and progressive glaucoma. Fuchs' heterochromic iridocyclitis is not associated with severe uveitis in the postoperative period. Typically, patients have mild anterior segment inflammation over several years; sometimes, the condition resolves. There was a single case (5.89%) of severe post operative uveitis in our study which was treated with tablet prednisolone for 6 weeks along with the topical steroids. Three eyes (17.6%) had mild anterior chamber reaction at 2 weeks, Ram et al.[23] report a higher incidence, 31% with early uveitis and 13.7% with late recurrence of uveitis after surgery. No late recurrenceof uveitis was reported probably due to the shorter follow up in our study.

Studies have quoted glaucoma as amongst the more serious postoperative complications of cataract surgery with IOL implantation in cases of Fuchs' heterochromic uveitis. The incidence of glaucoma post cataract extraction varying incidence from 3% to 35%.[23,25,28] . Milazzo et al.[25] report an 11.7% incidence and Ram et al.[23] a 10.3% incidence of persistent IOP elevation that needed long periods of anti-glaucoma medication. The incidence of post operative raised IOP was found in 3 (17.6%) cases our study and were all

treated with topical anti glaucoma medication varying from 4 to 8 weeks and one case (5.89%)developed secondary glaucoma and was kept on long term anti glaucoma medications. Vitreous opacities are frequently noted in cases with Fuchs' heterochromic uveitis, with an incidence of 12% to 50%.[29,23] . In our study, 1 patient (5.89%) continued to have vitreous haze postoperatively, yet had an excellent 20/20 vision on the Snellen's chart. There was no intervention needed for that case. Cystoid macular edema is a major obstacle to visual rehabilitation after cataract surgery in patients with uveitis. We found no such complications in our study, however researchers have reported incidence of CME of 22% for uveitis of other etiology,[31] and 2.3% reported for routine ECCE and IOL implantation.[32] Perhaps our sample size is too small to extrapolate our result.

V. Conclusion

In conclusion, phacoemulsification with IOL implantation is safe in patients with Fuchs' heterochromic uveitis. The surgery is similar to routine surgery and only requires careful follow up to look for uveitis, hyphema and raised IOP. Efforts should be made to minimise postoperative uveitis by preoperative treatment with steroids locally or systemically. Visual outcome maybe slightly compromised due to persistent vitreous opacities. However, almost all of our patients achieved an excellent visual acuity without any major intra or postoperative complications.

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