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VITRECTOMY IN CHRONIC UVEITIS

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ABSTRACT

Vitrectomy was performed on 25 eyes in 21 patients with chronic uveitis from various etiologies. Postoperative follow up averaged 22.8 months with visual improvement in 24 of 25 eyes.

In this retrospective study, the techniques employed and the beneficial effect of vitrectomy alone or vitrectomy combined with cataract surgery (lensectomy in most cases) on improving vision and decreasing the number and severity of recurrent attacks of uveitis are reviewed. Also, the indications of surgery, the effect of the surgical procedure on intraocular pressure, the prognostic factors and the management of complications are discussed.

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INTRODUCTION

Chronic uveitis frequently leads to cataract formation and vitreous organization. Angle closure glaucoma, traction retinal detachment, cystoid macular edema, and ocular hypotony are other important complications which are seen in uveitic eyes.

Surgical removal of cataract in these eyes is complicated by iris atrophy, posterior synechiae, bleeding from abnormal iris vasculature, and severe postoperative inflammation.[1]

This article reviews the indications, surgical techniques and the results of vitrectomy combined with cataract surgery or vitrectomy alone in 25 eyes of 21 patients suffering from chronic uveitis.

PATIENTS AND METHODS

The records of 25 eyes of 21 patients with chronic uveitis that had consecutively undergone pars plana or pars plicata vitrectomy alone or combined with cataract surgery were reviewed.

There were 11 females and 10 males with an average age of 21 years (range five to 61 years). The patients were followed postoperatively for an average period of 22.8 months (range six to 48 months). The diagnosis of uveitis was classified as pars planitis (three eyes), Behcet's syndrome (four eyes), JRA-induced uveitis (six eyes), Fuch's heterochromic iridocyclitis (five eyes) and idiopathic panuveitis (seven eyes).

All patients considered for surgery had a visual acuity of 20/200 or less except case 8b who had a visual acuity of 20/80 before the operation (Table I).

The duration of symptoms ranged from one year to 16 years with an average of 3.2 years.

Clinically significant lens opacity was present in 22 eyes preoperatively. Moderate vitreous opacity including vitreous veil was present in case of Fuch's heterochromic iridocyclitis, and condensation of vitreous, secondary to longstanding vitritis was found in cases of pars planitis and panuveitis. Fresh vitreous hemorrhage was visible in all cases of JRA uveitis.

The important associated ocular pathology consisted of band keratopathy in five eyes (including all JRA cases), posterior synechiae in 13 eyes (including

Table I. Preoperative vision of 25 eyes undergoing vitrectomy with or without cataract surgery

Vision	Number	%
20/20-20/40	-	-
20/50-20/100	1	4%
20/200-CF	16	64%
HM - LP	8	32%
Total	25	100%

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all cases of JRA and Bechet's syndrome but no posterior synechiae in cases of Fuch's heterochromic iridocyclitis and pars planitis), severe ocular hypotony (IOP < 8 mmHg) in seven eyes (cases 6, 8a, 8b, 12, 15, 17, 19), ocular hypertension (IOP > 22 mmHg) in one eye (case 1) and rhegmatogenous retinal detachment in one eye (case 15).

Preoperative evaluation of all patients included medical history, routine eye examination and laboratory investigations. Prior to surgery, thorough examination of the peripheral retina was done. In many of the cases, the peripheral retina could be examined with scleral depression despite significant media haziness. If found necessary, contact A and B scan echography was used to determine the degree of vitreous opacification, status of the retina, thickening of the choroid and the presence of a cyclitic membrane.

Preoperative administration of steroid via topical, subtenon and systemic routes was accomplished to minimize the inflammation. Some of the patients received an intramuscular injection of hydrocortisone 50 mg, six hours and 100 mg one hour before the beginning of the surgery. Intraoperative injection of hydrocortisone was accomplished via IV drip.

Surgical Technique:

The patients were prepared with maximum dilation although in most cases posterior synechiae prevented good dilation. The 20 gauge sclerotomy incisions were made with a disposable knife at 10, 12 and 2 o'clock meridians, 3-3.5 mm from surgical limbus. Pars plicata approach was chosen in patients six years old or younger. 12 o'clock meridian sclerotomy was used for infusion cannula and 10 and 2 o'clock meridian sclerotomies were used for vitrectomy probe and fiberoptic light pipe. The posterior synechiae were broken with the tip of the vitrectomy probe: the probe was passed between the iris and the anterior lens capsule and the adhesions were released. A few drops of ten times diluted mixture of epinephrine and atropine were injected around the pupil and immediately suctioned. If the pupil still remained miotic, sphincterectomy and pupilloplasty was performed.

Cataract Surgery: Cataract surgery was combined with vitrectomy in 22 eyes. Lensectomy was done with vitrectomy probe in 16 eyes and by ultrasonic fragmentation in two eyes. Both the anterior and posterior capsules were removed. In a 61 year old patient (case 5), ICCE was done followed by vitrectomy in the same session. In three eyes (cases 10, 11, 20), the extracapsular method was chosen for extraction of the nucleus and then the remnants of cortex as well as the anterior and posterior capsules were removed via the closed pars plana approach.

Table II. Summary of the surgical procedures performed for 25 eyes

- Pars plana lensectomy and central coring (subtotal) vitrectomy (five cases: 13, 14, 16, 21a, 21b)
- Pars plana lensectomy and deep vitrectomy (seven cases: 1, 3a, 3b, 6, 12, 17b, 19)
- Pars plicata lensectomy and deep vitrectomy (five cases: 8a, 8b, 9, 17a, 18)
- Pars plana deep vitrectomy (three cases: 2, 4, 7*)
- pars plana deep vitrectomy combined with ICCE (one case: 5)
- Pars plana deep vitrectomy combined with ECCE (two cases: 10,11)
- ECCE, Pars plana deep vitrectomy, cryopexy and scleral buckling (one case: 20)
- Pars plana lensectomy and deep vitrectomy, cryopexy, scleral buckling and silicone injection (one case: 15)

* The patient underwent lensectomy two years later due to progress of the lens opacity.

Vitrectomy: In cases of Fuch's heterochromic cyclitis only core vitrectomy was done. Deep vitrectomy was accomplished in other cases. Peeling of the preretinal membranes was carried out when necessary with the aid of intraocular forceps. In case 15 with associated retinal detachment and PVR, deep vitrectomy as well as scleral buckling, cryopexy and silicone oil injection was performed. The retina was reattached and silicone oil removal was done three months later. The procedures for all 25 eyes have been summarized in Table II. The infusion solution (BSS) usually contained dexamethasone 8 μg/ml as well as gentamicin 4 μg/ml. Alternatively, intraocular injection of 400 μg of dexamethasone and 100 μg of gentamicin was done in the end of the surgical procedure. After closure of the sclerotomy sites and conjunctiva, subtenon injection of 40 mg of long acting methylprednisolone acetate and 40 mg of gentamicin was carried out.

Postoperative Treatment: Postoperative treatment was with topical steroids, antibiotics and cycloplegics plus systemic steroids which were gradually tapered and then discontinued in most cases after subsidence of all inflammatory reactions. The average time of cessation of topical steroids was 9 months after the operation. Systemic steroids were tapered and stopped one month after the surgery except in five patients (cases 2, 10, 11, 17, 19) in whom because of postoperative exacerbations, low doses of oral steroids were continued, administered every other day.

RESULTS

The preoperative and postoperative evaluations of 25 eyes with chronic uveitis treated by pars plana or pars plicata vitrectomy with or without cataract surgery are shown in Table III.

The visual results after surgical treatment are shown in Tables IV and V. Vision of 20/40 or better was

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Table III. Preoperative and postoperative evaluations of 25 eyes with chronic uveitis undergoing pars plana/pars plicata vitrectomy with or without cataract surgery

Case	Sex/Age (years)	Diagnosis	Duration of Symptoms (years)	Preoperative Visual acuity	Postoperative Visual acuity	pre OP. IOP mmHg	Post OP IOP mmHg	Date of operation	Postoperative Complications	Subsequent surgery
1	F/8	JRA	3	20/300	20/100	27	9	12/24/86	RD	Scleral buckling Cyclocryotherapy
2	F/8	Idiopathic panuveitis	1	20/400	20/40	12	14	11/14/85	-	-
3a	F/13	Idiopathic panuveitis	4	OD:20/400	20/20	11	12	10/29/86	-	-
3b	F/13	Idiopathic panuveitis	4	OS:20/800	20/20	11	12	1/14/87	-	-
4	M/28	Pars planitis	1	H M	20/40	12	10	4/22/87	-	-
5	F/61	Idiopathic panuveitis	1	20/400	20/25	13	12	12/3/86	-	-
6	M/9	Idiopathic panuveitis	2	LP	20/300	4	10	7/27/85	-	-
7	M/18	Pars planitis	2	20/800	20/40	10	14	11/23/85	progress of lens opacity	Lensectomy
8a	F/6	JRA	1	OD:H M	20/30	6	15	4/18/88	Vitreous hemorrhage	-
8b	F/6	JRA	1	OS:20/80	20/25	4	14	5/18/88	-	-
9	F/6	JRA	1	CF at 20 cm	20/80	9	10	12/6/88	-	-
10	M/40	Behcet	9	H M	20/80	10	12	2/14/89	-	-
11	M/46	Beehet	16	20/400	20/40	13	12	1/31/88	-	-
12	M/38	Behcet	4	LP	20/800	2	2	3/1/86	Exudative RD	-
13	M/25	Fuch's	2	CF at 50cm	20/25	12	14	5/11/85	Peripheral retinal tear	Cryotherapy of the tear
14	M/23	Fuch's	4	CF at 20 cm	20/20	8	12	8/6/86	-	-
15	F/26	Idiopathic panuveitis	3	CF at 20 cm	20/80	3	10	4/12/86	-	Silicone oil removal
16	M/25	Fuch's	3	LP	20/25	10	10	4/10/87	-	-
17a	F/6	JRA	4	OD:LP	20/30	Zero	8	12/16/85	-	-
17b	F/9	JRA	7	OS:20/200	20/25	8	8	9/	-	-
18	F/5	Pars planitis	1	20/400	20/30	10	14	2/21/87	-	-
19	M/26	Bechet	2	LP	LP	4	Zero	1/30/88	Rubeosis iridis hypotony	-
20	F/39	Idiopathic	1	20/800	20/200	14	12	5/14/88	-	-
21a	F/22		2	OD:20/200	20/20	10	15	9/29/88	Fungal endophthalmitis	Deep vitrectomy
21b	F/21	Fuch's	2	OS:20/400	20/25	10	14	4/29/87	-	-

achieved in 17 of 25 eyes (68%) but visual improvement occurred in 24 of 25 eyes (96%). The reasons for postoperative vision less than 20/40 are shown in Table VI. All of the eyes with preoperative diagnosis of Fuch's heterochromic iridocyclitis reached the final visual acuity of 20/25 or 20/20. The only patient with no postoperative improvement in his visual acuity had the diagnosis of Behcet's syndrome (case 19). Severe optic atrophy and retinal ischemia were present as sequelae of longstanding occlusive vasculitis in this patient's eye. Rubeosis iridis eventually occurred.

Complications: The only intraoperative complication was severe hemorrhage in case 12 which originated from the dense cyclitic membrane but was successfully controlled.

Postoperative complications included: 1) rhegmatogenous retinal detachment in case 1 which occurred five months after combined lensectomy-vitrectomy but retina became reattached following scleral buckling, 2) immediate postoperative exudative retinal detachment in case 12 that resolved 10 days later, 3) progress of lens opacity in case 7 who had undergone vitrectomy alone; lensectomy was done two years after the first operation, (4) a peripheral horseshoe tear was found in case 13 six months after lensectomy-vitrectomy. Transconjunctival cryotherapy of the tear was performed, 5) postoperative vitreous hemorrhage (rebleeding) occurred in case 8a a few days after surgery but was spontaneously absorbed, 6) fungal endophthalmitis occurred in case 21a but this complication was success-

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Table IV. Postoperative visual results considering the type and etiology of uveitis

Diagnosis	No	20/20-20/40	20/50-20/100	20/200-CF	HM-LP
Fuch's heterochromic cyclitis	5	5(100%)			
Pars planitis	3	3(100%)			
JRA	6	4(67%)	2(33%)		
Behcet's syndrome	4	1(25%)	1(25%)	1(25%)	1(25%)

fully managed with medical treatment and deep vitrectomy. The final visual acuity reached 20/20.

Postoperative Intraocular Pressure: The intraocular pressure remained high and uncontrolled despite medications postoperatively, necessitating the performance of cyclocryotherapy in case 1.

Ocular hypotony persisted only in two cases (cases 12, 19) but it was eliminated in the other five eyes which had suffered from hypotony preoperatively.

Exacerbations: Recurrence of inflammation occurred postoperatively in six eyes (cases 2, 10, 11, 17a, 17b and 19) but the exacerbations were mild and easily controlled. Low doses of oral steroids (prednisolone) were continued as every other day administration in these patients.

DISCUSSION

During the past decade, there has been increasing evidence that vitrectomy has a significant therapeutic role in the management of chronic uveitis.

Diamond and Kaplan[2] first reported the results of combined lensectomy and vitrectomy in 15 eyes of 13 patients. The follow up period of their patients was short but postoperative improvement in vision of all of the operated eyes was observed. Previously, the final results of conventional intracapsular or extracapsular lens extraction performed for complicated cataract of uveitic eyes had been disappointing because of numerous complications which frequently followed the surgery, including severe postoperative inflammation, development of pupillary and cyclitic membranes, aggravation of vitreous haziness, traction retinal detachment, macular edema, ocular hypotony, and occasionally phthysis bulbi.

Regarding the type and etiology of uveitis, we reached the following conclusions:

The final results in cases of Fuch's heterochromic cyclitis were excellent.

No preoperative active neovascularization of the vitreous base was present in our pars planitis cases. All of them had postoperative visual acuities of 20/40 or better and none required further surgery.

All of our JRA cases had early onset, pauciarticular type of the disease. Band keratopathy, posterior synechiae, complicated cataract and fresh vitreous hemorrhage originating from cyclitic membrane were present in each of these cases preoperatively. Half of the operated eyes suffered from preoperative severe ocular hypotony. The hypotony was eliminated following lensectomy-vitrectomy. The case with preoperative glaucoma needed antiglaucoma medications postoperatively and even cyclocryotherapy was required. All of our JRA cases achieved postoperative vision of 20/100 or better, two-thirds of them gaining visual acuities of 20/40 or better.

Cases of Behcet's syndrome usually have poor visual prognosis. It is due to the presence of optic atrophy, chorioretinal scars and severe retinal ischemia secondary to chronic, inappropriately treated occlusive vasculitis.

Regarding the reasons for postoperative vision less than 20/40, it is noteworthy to consider amblyopia as a significant factor in cases of early onset JRA.

Different forms of maculopathy, e.g, macular pucker, macular chorioretinal scars and healed retinal detachments with previous macular involvement had a significant role in decreasing the postoperative vision of our cases.

Optic atrophy contributed to decreased postoperative vision in the cases of Bechet's syndrome.

In summary, 24 of 25 eyes with chronic uveitis from various etiologies which underwent pars plana/pars plicata vitrectomy with or without cataract surgery had improvement in their vision postoperatively. 68% of these cases attained visual acuities of 20/40 or better. These eyes were made as quiet as possible before the operation by means of topical, periocular and systemic steroids. The surgical precedure did not lead to aggravation of the inflammation. On the contrary it

Table V. Postoperative visual results in 25 eyes undergoing vitrectomy with or without cataract surgery

Vision	number	%
20/20-20/40	17	68%
20/50-20/100	4	16%
20/200-CF	3	12%
HM-LP	1	4%
Total	25	100%

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Table VI. Reasons for vision less than 20/40 in 25 eyes undergoing vitrectomy with or without cataract surgery

Case 1 Band keratopathy, amblyopia, previous RD with macular involvement
Case 6 Amblyopia, macular pucker
Case 9 Amblyopia
Case 10 Partial optic atrophy, previous macular chorioretinal scar
Case 12 Optic atrophy, previous macular chorioretinal scar
Case 15 Band keratopathy, previous RD
Case 19 Severe optic atrophy, occlusion of all vessels, extensive chorioretinal scars
Case 20 Band keratopathy, macular pucker

had a good effect on the uveitis course, decreasing the frequency and severity of exacerbations. Also, it had a beneficial effect on the intraocular pressure, eliminating the preoperative hyopotony in most cases.

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