

VITRECTOMY-LENSECTOMY OUTCOMES AFTER PHACOFRAGMENTATION COMPLICATIONS

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SUMMARY – In this study we presented visual results and complications in patients treated by vitrectomy and lensectomy for posterior dislocation of lens fragments during phacoemulsification. This retrospective study was carried out between 1998-2000. Eighteen patients had a vitrectomy and lensectomy done for posterior dislocation of lens fragments. The median age of the patients was 71. The median timing of the surgery was 13 days. One patient had a vitrectomy performed at the time of cataract surgery (day 0). Uveitis was present in 14 (78%) patients, corneal edema in 9 (50%) and ocular hypertension in 10 (55,5%) patients. After vitrectomy visual acuity was 0,5 or better in 9 patients (50%), 4 patients (22%) had intraocular hypertension, 2 patients (11%) had corneal edema, and 4 patients (22%) had uveitis. Visual acuity improved in most (17) our patients after vitrectomy. There was no statistically significant difference in final visual outcome considering timing of the vitrectomy-lensectomy. Vitrectomy significantly reduces ocular hypertension, uveitis and corneal edema.

Key words: *vitrectomy; lensectomy; phacoemulsification; lens fragments dislocation*

Introduction

Lens fragments may be lost posteriorly while delivering the nucleus during phacoemulsification. This is a potentially serious, sight threatening complication.

With the increasing popularity of phacoemulsification there will be more cases of dislocated lens into the vitreous cavity.

Complications associated with the dislocation of the lens and nuclear fragments include intraocular inflammation, chronic glaucoma, cystoid macular edema, corneal edema and retinal detachment.

Pars plana vitrectomy combined with ultrasound fragmentation has been shown to be effective in retained lens material, reducing uveitis and glaucoma, and improving visual acuity over preoperative levels. Timing of vitrecto-

my is controversial, although recent reports suggest that an early intervention may be advantageous.

The purpose of this study is to evaluate the visual outcomes and complications.

Patients and methods

We evaluated retrospectively 18 consecutive eyes with retained intravitreal lens fragments after phacoemulsification between October 1998 and January 2001 at the Department of Ophthalmology, Sestre milosrdnice University Hospital in Zagreb, Croatia.

Ocular examination included the recording of visual acuity, applanation tonometry, biomicroscopy, fundus and ultrasound examination. Intraocular pressure was considered raised when above 22 mmHg or if antiglaucoma medication was required. Corneal edema was considered significant when stromal or epithelial edema were present. Initial clinical features marked intraocular inflammation.

Twelve patients were from our Clinic and six patients were from neighboring institutes.

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We had four nuclei, four 2-quadrant fragments and in ten patients there was one-quadrant fragment. In six cases we made sulcus fixation of the IOL, in six cases that had residual posterior capsule we made posterior chamber IOL implantation and in six patients we performed surgery without lens implantation. In one patient we performed retinal attachment surgery after the lens fragment extraction.

Vitreotomy was performed when persistent uveitis or raised intraocular pressure (IOP) was present. Removal of lens fragments was accomplished by using a standard three port pars plana vitrectomy technique. The nuclear fragment was aspirated into the center of the vitreous cavity and the light pipe was used to force feeding the fragments initially into the vitrectomy cutter. If the nuclear fragment was too hard to allow this, the fragmatome was used with the help of the light pipe and a minimal amount of ultrasound energy. Perflouorocarbon was used to float hard nuclear fragments into the midvitreous cavity and removed at the end of the procedure. The peripheral retina was inspected for retinal breaks at the end of the procedure. Separate scleral incisions were made for IOL insertion.

Results

Clinical features and details of each case are summarised in Table 1.

The average age was 71 (range 59-85), and the mean follow up period was 13 months (range 2-36). Ten (55 %) out of 18 patients had increased IOP before vitrectomy, 4 (22%) after vitrectomy. Fourteen (78%) patients had uveitis before vitrectomy and 4 (22%) after vitrectomy. Eight (44%) patients had corneal edema before and 2 (11 %) after vitrectomy. In one case vitrectomy was performed at the time of phacoemulsification. The median time to vitrectomy was 13 days (range 4-46). With a minimum of 2-month follow up, visual acuity improved after vitrectomy in 17 patients. At the final follow up 9 patients (50%) had a visual acuity of 0,5 or better. There was no difference in visual acuity of patients that underwent early vitrectomy (8 days) compared with patients that were operated later. In both groups visual acuity was 0,5 or better in 50% of patients.

A posterior chamber intraocular lens (IOL) was implanted primarily in 12 (66%) cases. Intraoperative com-

Table 1. Patients data

case	age/sex	referral pattern (days)	timing of vitrectomy	nucleus or quadrants lost	IOL implantation *
1	67/M	SM	5	1 quad	sulcus fixation
2	69/M	SM	14	2 quads	implantation
3	73/F	SM	17	1 quad	implantation
4	85/F	SM	24	whole	sulcus fixation
5	59/F	other	7	whole	–
6	68/M	SM	0	1 quad	–
7	72/F	other	46	1 quad	sulcus fixation
8	69/M	other	12	whole	–
9	73/M	SM	10	2 quads	sulcus fixation
10	71/F	SM	16	2 quads	–
11	66/M	other	10	1 quad	implantation
12	81/M	SM	13	1 quad	implantation
13	70/M	other	8	1 quad	sulcus fixation
14	66/F	SM	4	2 quads	sulcus fixation
15	75/M	SM	4	1 quad	implantation
16	69/M	SM	19	1 quad	–
17	72/M	other	17	whole	implantation
18	74/M	SM	12	1 quad	–

SM= Sestre milosrdnice University Hospital Zagreb;quad =quadrant;* IOL implantation after vitrectomy

Table 2. Patient data

case	VA	previtrectomy			VA	postvitrectomy			complications
		uveitis	corneal edema	IOP mmHg		uveitis	corneal edema	IOP mmHg	
1	HM	yes	no	21	0,15	no	no	20	–
2	0,02	yes	yes	33	0,3	no	no	20	–
3	0,1	no	no	17	1,0	no	no	18	–
4	CF	yes	yes	25	0,9	no	no	17	–
5	CF	yes	yes	43	HM	yes	yes	25	RD
6	–	no	no	24	0,2	no	no	23	OH
7	HM	yes	yes	24	0,6	no	no	17	–
8	0,05	yes	no	19	0,15	no	no	16	–
9	0,2	no	no	21	0,5	no	no	24	OH
10	CF	yes	yes	9	0,15	yes	no	17	R.D.
11	CF	yes	yes	23	0,05	yes	no	19	CME,
12	0,05	yes	no	24	0,6	no	no	15	–
13	0,1	yes	no	21	0,6	no	no	17	–
14	0,2	yes	no	23	0,5	no	no	16	–
15	0,15	yes	no	18	0,5	no	no	14	–
16	0,05	yes	yes	26	0,2	no	no	20	–
17	0,01	yes	yes	25	0,15	yes	yes	23	R.D.
18	0,1	no	no	16	0,5	no	no	18	–

VA= visual acuity; CF = counting fingers; HM = hand movement; IOP= intraocular pressure; RD = retinal detachment; CMEcystoid macular edema; OH = ocular hypertension; UV= uveitis

plications were iatrogenic retinal tear and partial hemorrhages at the time of surgery in two cases. Postoperative complications occurred in six eyes (33%). Three eyes developed retinal detachment, in the first case it occurred 3 weeks after the operation, in the second case 2 months and in the third case 4 months after the operation. Retinal reattachment surgery was successful in two cases. Visual acuity worsened in 5 patients as the result of previous macular detachment and excessive proliferative vitreoretinopathy. Cystoid macular edema was observed in one case. A slight elevation of intraocular pressure up to 22 mmHg occurred in 4 cases. They were well controlled with medication which was discontinued within 3-4 weeks.

Discussion

Dislocation of lens fragments into the vitreous during phacoemulsification is an uncommon event. However, with wider use of the technique this complication has been increasing in frequency¹⁴. Unencapsulated lens material is

known to induce a variable degree of intraocular inflammation often associated with a number of potential complications¹⁻⁵. Some success has been reported with conservative treatment in eyes with relatively little retained lens material and minimal symptoms^{3, 14}. However, Gilliland et al.³ also reported that even a minimal amount of lens material could cause persistent inflammation and other sight threatening complications. The removal of the lens fragments by vitrectomy seems logical because limiting of the inflammatory reaction should result in fewer long-term sequels and a better ultimate visual result. Vitrectomy has been reported to be effective and visual outcome has often been favorable although it does involve the risks of further surgical intervention³⁻⁶.

The ideal timing of vitreous surgery and lens fragment removal after cataract surgery is uncertain. A recent study has suggested that visual prognosis appears to be better if vitrectomy is done within 1 week⁶ although a number of studies have found no correlation between visual outcome and the timing of vitrectomy^{3, 4, 6, 7, 8, 10, 11}. Previous studies

are retrospective and may well be biased by a tendency to operate early on eyes with greater volumes of retained lens fragments, a marked early inflammatory response, or raised intraocular pressure at an earlier stage.

Delaying the vitrectomy for 2 weeks encourages softening of the nuclei and complete vitreous separation, which results in facilitating the vitrectomy and lensectomy. The advocates of early surgery argue that fewer complications are encountered with this approach. We found no correlation between the timing of the surgery and final visual outcome, although we believe the ideal time for intervention is after 10 to 15 days. This strategy allows time to control intraocular inflammation and IOP. Vitrectomy and lensectomy performed at the same time as posterior dislocation of the lens fragment by a vitreoretinal surgeon lowers the risk of corneal edema, uveitis and glaucoma. It also spares the patient from another operation. Table 2 shows the visual results and complications of some recent series reported in the literature.

We had relatively high percentage of postoperative ocular hypertension (22,2%) comparing to other studies. The reason is probably that we took very low pressure (22 mmHg) as a limit for ocular hypertension, comparing to 25 mmHg in Gilliland study³ and 30 mmHg in Kim study⁴.

Conclusion

We didn't find any difference in visual acuity in patients that underwent early vitrectomy (8 days) compared to the patients that were operated later.

If there is a dislocation of lens fragment into vitreous cavity during phacoemulsification, we recommend proceeding with vitreoretinal surgery and lens implantation if possible. If there is any reason not to undergo vitreoretinal surgery immediately, we recommend to finish the operation and perform vitrectomy when possible (within 10- 15 days).

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Sažetak

REZULTATI VITREKTOMIJE – LENSEKTOMIJE NAKON
KOMPLIKACIJA FAKOEMULZIFIKACIJE*Z. Vataavuk, A. Pentz, G. Benčić i Z. Mandić*

U ovoj studiji prikazani su rezultati vidne oštine i komplikacije kod pacijenata za koje je rađena vitrektomija i lensektomija nakon dislokacije lećnih fragmenata za vrijeme fakoemulzifikacije. Studija je rađena od listopada 1998. godine do siječnja 2001. godine. Kod 18 pacijenata urađena je vitrektomija i lensektomija lećnih fragmenata nakon dislokacije u stražnji dio oka. Srednja dob pacijenata je bila 71 godinu. Srednje vrijeme od operacije pri kojoj se dogodila komplikacija do vitrektomije bilo je 13 dana. Kod jednog bolesnika rađena je vitrektomija odmah po komplikaciji (dan 0). Uveitis je bio prisutan u 14 (78%) bolesnika, kornealni edem u 9 (50%) i povišen intraokularni tlak u 10 (55,5%) bolesnika. Nakon vitrektomije vidnu oštrinu 0,5 ili bolju imalo je 9 bolesnika (50%), 4 bolesnika (22%) imalo je povišen intraokularni tlak, 2 bolesnika (11%) su imali kornealni edem i 4 bolesnika (22%) imali su uveitis. Poboljšanje vidne oštine postignuto je kod većine bolesnika (17) nakon vitrektomije. Nije bilo statistički značajne razlike u konačnom ishodu operacija obzirom na vrijeme izvođenja vitrektomije- lensektomije. Vitrektomija značajno reducira intraokularni tlak, uveitis i kornealni edem.

Ključne riječi: *vitrektomija; lensektomija; fakoemulzifikacija; dislokacija lećnih fragmenata*