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Exchange technique for opacified hydrophilic acrylic intraocular lenses

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PURPOSE. To report an exchange technique for opacified hydrophilic acrylic intraocular lenses (IOLs).

METHODS. Twenty patients with two different types of opacified hydrophilic acrylic IOLs underwent IOL exchange by a single surgeon. Circumferential enlargement of the pre-existing capsulorrhexis was a critical step of the procedure, and resulted in expression of the IOL with minimal traction to the capsule. Implantation of an in-the-sulcus IOL followed. Surgical technique, complications, and visual outcome are discussed.

RESULTS. Time from the initial cataract operation varied from 15 to 61 months (mean 30.5), and in all cases marked fibrosis was encountered. Eighteen patients had uncomplicated IOL exchange. Posterior capsule rupture occurred in two cases. Vision improved in 16 cases, remained unchanged in 3 cases, and deteriorated in 1 case.

CONCLUSIONS. IOL exchange of opacified hydrophilic acrylic IOLs is a particularly challenging procedure due to extensive fibrosis. Circumferential enlargement of the pre-existing capsulorrhexis significantly facilitates the mobilization of the IOL from its fibrous pocket, with the use of minimal forces. Thus, the risk of zonular dehiscence or posterior capsule rupture is minimized. (Eur J Ophthalmol 2005; 15: 465-7)

KEY WORDS. Acrylic intraocular lens, Exchange, Hydrophilic, Opacification

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INTRODUCTION

Postoperative delayed opacification of hydrophilic acrylic intraocular lenses (IOLs) is being reported with increased frequency (1, 2). There is still limited literature on exchange techniques of opacified IOLs long after their implantation. Removal may prove particularly challenging, since excessive fibrosis is usually encountered (3).

In our department, 224 SC600-2 Cirrus International Acryflex IOL (Medical Developmental Research, Inc., Clearwater, FL) and 54 Aqua-Sense IOL (Ophthalmic Innovations International Inc. [OII], Ontario, Canada) were implanted between 1998 and 2000. Of those, 16 patients with Acryflex and 4 patients with Aqua-Sense IOLs underwent IOL exchange due to decreasing visual acuity (Tab. I). The decision to perform the procedure was based strictly on patients' dissatisfaction, and after they were comprehensively informed about the potential complications. Time from the initial cataract operation was 15 to 61 months (mean 30.5).

After subconjunctival injection of plain lignocaine 1%, a 5- to 6-mm superior clear-cornea incision and a second paracentesis at 3 o'clock were made. The anterior chamber was filled with sodium hyaluronate.

With intraocular scissors, a small radial incision at the fibrosed capsulorrhexis rim was created (Fig. 1A). Using capsulorrhexis forceps, a new tear was initiated parallel and more peripheral to the existing rhexis (Fig. 1B). When marked fibrosis was encountered, the created anterior capsule flap was cut with scissors, and the same procedure was restarted at an adjacent point of the capsulorrhexis margin. Although it was not necessary to complete

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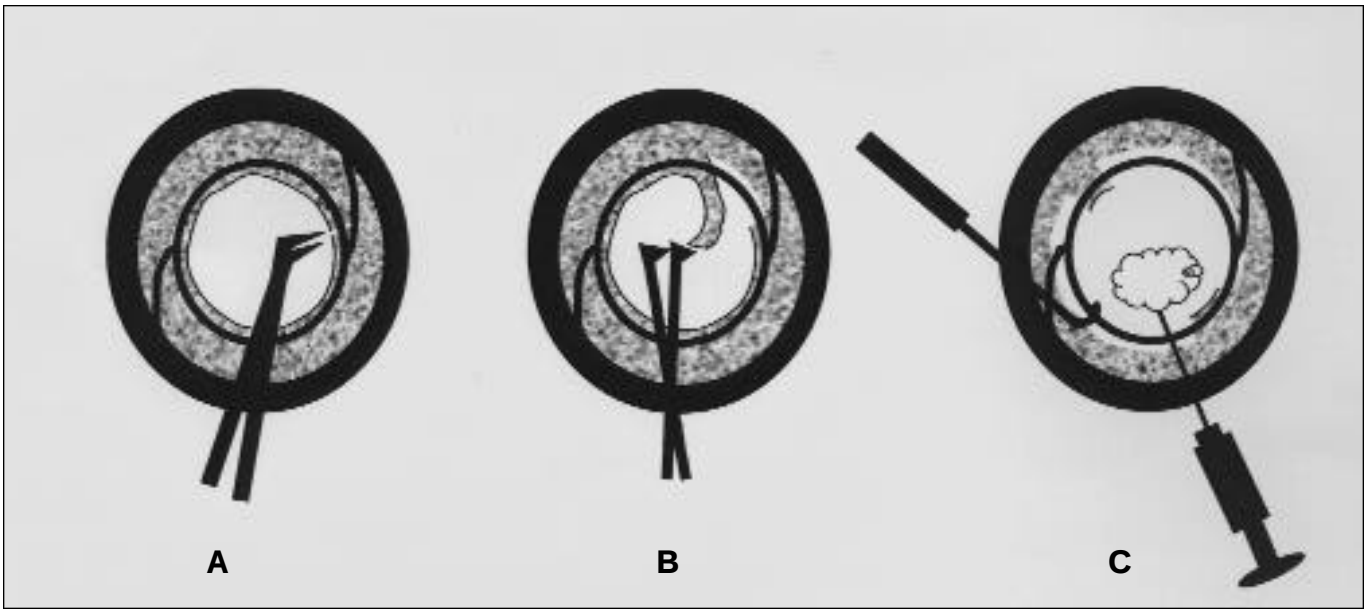

Fig. 1 - Schematic of the new capsulorrhexis **(A, B)** and the viscodissection of the optic from the posterior capsule **(C)**.

TABLE I - PATIENTS' CLINICAL CHARACTERISTICS

Patient	Sex (age, yr)	Ocular disease	Eye	Opacified lens type	VA (log) post-phaco	Months from Phaco	VA (log) pre-exchange	VA (log) post-exchange	Complications
1	F (73)	-	L	Cirrus	0.2	23	0.3	0.2	—
2	M (81)	ARMD (A)	R	Cirrus	0.8	21	1.0	1.0	—
3	M (96)	ARMD (A)	L	Cirrus	0.5	38	0.8	0.5	—
4	F (77)	ARMD (A)	R	Cirrus	0.2	26	0.3	0.8	PC rupture, vitreous loss
5	F (84)	-	R	Cirrus	0.2	27	0.5	0.2	—
6	M (62)	FHC	R	Cirrus	0.0	44	0.3	0.2	—
7	M (74)	-	L	Cirrus	0.0	35	0.2	0.0	—
8	F (77)	POAG, PCO	R	Cirrus	0.0	35	0.5	0.0	—
9	F (81)	DR, PRP	R	Cirrus	0.0	45	0.3	0.2	—
10	M (68)	ARMD (A)	R	Cirrus	0.0	19	0.2	0.2	—
11	M (68)	-	L	Cirrus	0.0	23	0.3	0.2	—
12	F (82)	PCO, DR	R	Cirrus	0.2	24	0.6	0.2	—
13	F (61)	PCO	L	Cirrus	0.2	29	0.6	0.2	—
14	F (78)	-	R	Cirrus	0.0	47	0.2	0.0	—
15	F (76)	POAG	R	Cirrus	0.2	34	0.3	0.2	—
16	F (78)	-	R	Cirrus	0.2	61	0.5	0.2	
17	M (77)	ARMD (A)	R	Aqua-Sense	0.2	25	0.3	0.2	
18	F (87)	ARMD (A)	R	Aqua-Sense	0.2	26	0.6	0.2	
19	F (85)	POAG, ERM	R	Aqua-Sense	0.6	15	0.8	0.8	PC rupture, vitreous loss
20	M (81)	ERM	L	Aqua-Sense	0.2	42	0.3	0.2	

VA = Visual acuity; log = LogMAR; Cirrus = SC600-2 Cirrus International Acryflex; ARMD (A) = Age-related macular degeneration (atrophic); PC = Posterior capsule; FHC = Fuchs heterochromic cyclitis; POAG = Primary open angle glaucoma; PCO = Posterior capsule opacification; DR = Diabetic retinopathy; PRP = Panretinal photocoagulation; ERM = Epiretinal membrane

the new capsulorrhexis through 360o, significant widening of the capsulorrhexis aperture was achieved.

After slightly lifting the lens optic edge with an IOL hook inserted through the second paracentesis, a complete viscodissection of the optic from the posterior capsule was slowly achieved with the viscoelastic cannula (Fig. 1C).

Subsequently, smooth dialing of the IOL using intraocular forceps or a dialer generally led the haptics to slip out from their fibrous capsular pocket. To avoid corneal endothelial damage, the IOL was retrieved from the eye without being cut or folded. An in-the-sulcus IOL was implanted, and a 10-0 nylon suture secured the corneal wound.

The haptics were amputated with scissors and left in the eye in two cases, due to firm fibrosis. A posterior capsule rupture occurred in two patients, necessitating anterior vitrectomy. Subsequently a new IOL was inserted in the sulcus, but in both cases the centration of the implant was suboptimal; the reasons for this decentration were not fully understood, but both these implants were removed and replaced by an anterior chamber IOL (model SI22UV, Bausch and Lomb). One of these patients subsequently developed chronic cystoid macular edema and the visual acuity deteriorated, while the other developed an epiretinal membrane and the final visual acuity did not improve. In two uncomplicated cases, the vision remained unchanged. In one, the reason remains unclear; the other had pre-exchange logMAR visual acuity 1.0, and when lens exchange allowed a clear view of the fundus, a macular hole was diagnosed. Zonular dehiscence was never encountered. Postoperatively, the new IOLs remained well centered over a period of 6 to 38 months (mean 25.5). The visual acuity improved in 16 patients (80%), remained unchanged in 3 patients (15%), and deteriorated in 1 patient (5%).

In our patients, posterior capsule rupture during lens exchange was associated with either no improvement or deterioration of the vision.

This highlights the importance of an effective IOL exchange technique. In our experience, widening of the preexisting capsulorrhexis was a crucial step of the lens exchange. This allowed for substantial reduction of the exerted forces, the integrity of the zonules was preserved, and the posterior capsule was usually not compromised.

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