Coll. Antropol. **29** (2005) suppl. 1: 59–62
UDC 617.741-004.1:617.72-002.1
Original scientific paper

Cataract Surgery and Intraocular Lens Implantation in Children with Juvenile Rheumatoid Arthritis associated Uveitis

Ivanka Petric[1], Valentina Lacmanović Lončar[1], Zoran Vatavuk[1], Renata Iveković[1], Irena Sesar[2] and Zdravko Mandić[1]

[1] University Department of Ophthalmology, Clinical Hospital »Systers of Mercy«, Zagreb, Croatia
[2] Department of Ophthalmology, University Hospital Mostar, Mostar, Bosnia and Herzegovina

A B S T R A C T

Clinical records of 6 children (7 eyes) with juvenile rheumatoid arthritis (JRA) who underwent cataract surgery with IOL implantation between January 1998 and December 2002 were reviewed. The median age at the time of cataract surgery was 8 years (range 5–14 years). The median follow up was 48 months (range 26 to 60 months). Five of six children (6 eyes) were on systemic imunosuppressive or anti-inflammatory therapy. Glaucoma was present in three eyes before surgery, and all three eyes underwent combined cataract surgery and trabeculectomy with mitomycin C. A final best corrected visual acuity of 0.5 or better was achieved in all eyes Postoperative complications included posterior capsule opacification (n=5), glaucoma (n=1), and cystoid macular edema (n=1). Intraocular lens implantation in children with control of preoperative and postoperative ocular inflammation could lead to favorable visual results.

Key words: *cataract, surgery, intraocular lens implantation, children, juvenile rheumatoid arthritis, uveitis*

Introduction

Children with juvenile rheumatoid arthritis (JRA) associated uveitis have tended to have high rates of complications including cataract development, glaucoma, band keratopathy, hypotony, macular edema, and phthisis[1–4]. Cataracts occur in 40% to 60% of patients with juvenile rheumatoid arthritis, occuring either as a consequence of intraocular inflammation or as a complication of steroid therapy.[5,6] Intraocular lens (IOL) implantation after cataract surgery in children with juvenile rheumatoid arthritis-associated uveitis is still being questioned. Implantation of an IOL in the eye of a young child with JRA associated uveitis carries with it a greater risk for the development of fibrosis, secondary retrolental membranes and lens capture.[3,7,8] In young children, clouding of the visual axis occurs at a critical period in their visual development and the major concern is amblyopia. Postoperative aphakia can be corrected by the use of spectacles or contact lenses. Amoungst paediatric populations, contact lenses are associated with poor compliance and the reported incidence of contact lens intolerance ranged from 17–38%[3,9]. Nevertheless, intraocular lens implantation reduces the risk of ambyopia due to contact lens intolerance and lack of complience.

This study evaluated the visual outcome and complications after cataract surgery with intraocular lens implantation in children with JRA-associated uveitis.

Patients and Methods

Between 1998 and 2002, 6 children (7 eyes) have undergone cataract surgery with intraocular lens implantation at »Sisters of Mercy» University Hospital (Table 1). A pediatric rheumatologist established the diagnosis of juvenile rheumatoid arthritis (JRA) in all cases. All children tested positive for antinuclear antibody (ANA) and anterior uveitis was diagnosed in all eyes. The median age of the children was 8 years (range 5–14 years). Complete ocular examination and slit lamp biomicroscopy were done in all cases. The uveitis had been under control for several weeks before the surgery. Preoperatively, dexamethasone (0.1%) drops, four times daily,

Received for publication January 11, 2005

TABLE 1
DEMOGRAPHIC AND CLINICAL CHARACTERISTIC OF 6 CHILDREN

Eye No	Patient No	Eye	Sex	Age at surgery (years)	Duration of uveitis (years)
1	A	RE	F	7	3
2	A	LE	F	8	4
3	B	LE	F	10	4
4	C	RE	M	5	2
5	D	RE	F	6	2
6	E	RE	F	14	5
7	F	LE	M	9	4

Abbreviations: F = female; LE = left eye; M = male; RE = right eye

were administred in all eyes. Four children (4 eyes) were on systemic methotrexate therapy (up to 15 mg weekly), one child was on additional systemic corticosteroids (prednisone, 40 mg daily) and in one child only, systemic corticosteroids (prednisone, 40 mg daily) was administered (Table 2). In one child (patient E), neither oral corticosteroid nor methotrexate therapy was given before surgery. Glaucoma was present in three eyes before surgery and all three eyes underwent combined cataract surgery and trabeculectomy with mitomycin C. Band keratopathy was found in four eyes and was visually significant in two eyes that were treated with ethylenediamine tetraacetic acid (EDTA) chelation intraoperatively. Posterior synechiae were found in all eyes before surgery and cystoid macular edema in two eyes. Preoperatively, all eyes demonstrated either minimal or no signs of uveitis.

All operations were performed by a single surgeon (Z.M.). A general anesthesic was used in all patients. The initial approach was a 3.2 mm scleral tunnel. Posterior synechiae were lysed with sodium hyaluronate 1.4% (Healon GV®, Pharmacia & Upjohn, Upsala, Sweden) and cyclodialysis spatula before capsulorhexis. Lens material was aspirated using irrigation/aspiration mode or phacoemusification. Posterior continuous curvilinear capsulorhexis (PCCC) was performed in all eyes and anterior vitrectomy was performed in three eyes. In five eyes an AcrySof® MA30BA foldable acrylic IOL (Alcon, Forth Worth, TX, USA) was implanted, and in two eyes, a heparin-surface-modified poly(methyl metacrylate) (HSM PMMA) IOL 809C (Pharmacia & Upjohn, Upsala, Sweden). A trabeculectomy with mitomycin C (MMC) was done at the time of cataract surgery in three eyes (Table 3).

All patients received subconjunctical dexamethasone 2 mg at the end of surgery. Postoperatively, all patients received topical dexamethasone hourly for a week, followed by a slow tapering on an individual basis, and cyclopentolate (1%), three times a day for 2 weeks. All children continued systemic therapy. Postoperative examinations were performed at the »Sisters of Mercy» University Hospital.

Results

The median follow up of 7 eyes (6 children) was 48 months (range 26 to 60 months) (Table 3). The cataracts were bilateral in one child and unilateral in five children. An IOL was implanted in all eyes, acrylic (Alcon, Forth Worth, TX, USA) in five eyes, and heparin surface modified PMMA (HSM PMMA) IOL 809C (Pharmacia & Upjohn, Upsala, Sweden) in two eyes. Glaucoma was present in three eyes before surgery recalcitrant to medical therapy and trabeculectomy with mitomycin C was

TABLE 2
PREOPERATIVE CHARACHERISTICS

Eye No	Preoperative visual acuity	Preoperative systemic therapy	Preoperative condition	Preoperative AC reaction C/F
1	0.05	methotrexate	PS	– / –
2	0.1	methotrexate	PS	– / –
3	HM	methotrexate	G, PS, BK, CME	+ / +
4	0.075	prednisone	PS, BK	– / –
5	0.1	prednisone	PS,BK,CME	± / –
6	0.025	–	G,PS	± / –
7	HM	methotrexate prednisone	G,PS,BK	– / –

Abbreviations: AC = anterior chamber; BK = band keratopathy; C = cells; CME = cystoid macular edema; F = flare; G = glaucoma; HM = hand movements; PS = posterior synechiae

TABLE 3
POSTOPERATIVE CLINICAL OUTCOMES

Eye No	Surgery	IOL	Follow up (months)	Complications	Additional treatment	Postoperative visual acuity
1	CE+IOL, PCCC, AV	HSM PMMA	60	-	-	0.7
2	CE+IOL, PCCC	HSM PMMA	48	PCO	YAG	1.0
3	CE+IOL, PCCC, Trab+MMC	acrylic	34	PCO	YAG	0.8
4	CE+IOL, PCCC, AV	acrylic	49	PCO, CME	YAG	0.5
5	CE+IOL, PCCC, AV	acrylic	26	Glaucoma	YAG, Trab	0.7
6	CE+IOL, PCCC, Trab+MMC	acrylic	56	PCO	-	0.9
7	CE+IOL, PCCC, Trab+MMC	acrylic	31	PCO	YAG	0.8

Abbreviations: AV = anterior vitrectomy; BK = band keratopathy; CE = cataract extraction CME = cystoid macular edema; G = glaucoma; heparin-surface modified polymethylmetacrylate; IOL = intraocular lens; PCCC = posterior continuous curvilinear capsulorhexis; PCO = posterior capsule opacification; PS = posterior synechiae; Trab + MMC = trabeculectomy with mitomycin C; YAG = neodymium:yttrium-aluminium-garnet laser capsuloctomy

performed at the same time. In one eye, glaucoma developed later and a further trabeculectomy was performed 32 months after cataract surgery (Table 3). Before the surgery, best-corrected visual acuity ranged from hand movements to 0.1. Postoperatively, best-corrected visual acuity had improved in all children, ranging from 0.5 to 1.0.

Opacification of the visual axis (PCO) was the most frequent complication (5 eyes) and occured in one eye (patient C) where anterior vitrectomy was performed. In five eyes, a neodymium: YAG (Nd:YAG) capsulotomy was performed as a secondary procedure and in one case the procedure was repeated. Cystoid macular edema was detected postoperatively in one eye.

Discussion

Our results showed that postoperative best corrected visual acuity was improved in all eyes and achieved a visual acuity of 0.5 or better. All eyes underwent cataract surgery with posterior chamber IOL implantation, whilst three eyes had combined cataract surgery with IOL implantation and trabeculectomy with mitomycin C. A history of juvenile rheumatoid arthritis associated uveitis was previously considered to be an absolute contraindication for intraocular lens (IOL) implantation because of high complication rates and poor clinical outcomes[3,8,10,11]. Several reports have shown that a posterior chamber IOL can be safely implanted with adequate control of preoperative and postoperative inflammation[12,13]. Previously, Ludvall and Zetterstorm[12] reported 7 children (10 eyes), aged 3.5-10 years, with heparin-surface modified PMMA posterior chamber IOL implantation. Best corrected visual acuity reached 20/50 – 20/20 in all but two eyes. Lam and Lowder[13] reported favorable clinical outcomes of five children (6 eyes) aged 7–12 years, who underwent cataract surgery with IOL implantation with adequate preoperative and postoperative intraocular inflammation. All eyes acheived a final best corrected visual acuity of 20/40 or better. However, some reports were not so encouraging. BenEzra and Cohen[14] reported a retrospective, non-randomized case series of cataract surgery in children with uveitis. Eight children (9 eyes) had juvenile rheumatoid arthritis (JRA) associated uveitis, and five eyes underwent cataract surgery with posterior chamber IOL implantation. After five years, only one child had maintained visual acuity of 6/6, while the others had visual acuities ranging between light perception and 6/60 due to development of retrolental membranes obstructing the visual axis. Foster and Barret[3] and Okhravi[15] also discouraged the use of IOL in children with juvenile rheumatoid arthritis associated uveitis. Our favorable visual results can be explained by strong control of preoperative intraocular inflammation.

Our results showed that posterior capsule opacification was the most common postoperative complication, which developed in five of seven eyes and in one child (patient C), even after anterior vitrectomy had been performed. This may be explained due to the younger age of the patient. These results are comparable to other studies[12–14]. As a secondary procedure, a neodymium:YAG (Nd:YAG) capsulotomy was performed in all eyes and in one case, patient C, was repeated. The frequency of glaucoma in our study was comparable to previous studies[12,14,16] and in this series, developed postoperatively in one eye. Due to the fact that it is unamenable to medical therapy, a trabeculectomy with mitomycin C was performed. During our follow up, only one patient developed postoperative cystoid macular edema and results were comparable with those reported by Paikos[17]. Cystoid macular edema presents a vision limiting complication, either as a consequence of cataract surgery or as the natural course of uveitis and glaucoma.

In children with juvenile rheumatoid arthritis associated uveitis, the timing of surgical intervention should be considered with caution. Surgery in the presence of active intraocular inflamation should be delayed. On the contrary, delaying the surgery, especially in the case of unilateral disease, could lead to irreversible amblyopia. Intraocular lens implantation in children with

well controlled preoperative and postoperative ocular inflammation could reduce the risk of irreversible amblyopia. We recognize the limitations of this study, as it was not prospective and the numbers were small. Longer term follow-up is needed to detect possible developments of other postoperative complications.

REFERENCES

1. TUGAL-TUTKUNT, I., K. HAVRLIKOVA, W. J. POWER, C. S. FOSTER, Ophthalmology, 103 (1996) 375. — 2. DANA, M. R., J. MERAYO-LLOVES, D. A. SCHAUMBERG, C. S. FOSTER, Ophthalmology, 104 (1997) 236. — 3. FOSTER, C. S., F. BARRETT, Ophthalmology, 100 (1993) 809. — 4. ROSENBERG, K. D., W. J. FEUER, J. L. DAVIS, Ophthalmology, 111 (2004) 2299. — 5. HOOPER, P. L., N. RAO, R. E. SMITH, Surv. Ophthalmol., 35 (1990) 120. — 6. KANSKI, J. J., Surv. Ophthalmol., 34 (1990) 253. — 7. FOSTER, C. S., L. P. FONG, G. SINGH, Ophthalmology, 96 (1989) 281. — 8. KANSKI, J. J., G. A. SHUN SHIN, Ophthalmology, 91 (1984) 1247. — 9. HILES, D. A., Ophthalmology, 87 (1980) 1296. — 10. HOLLAND, G. N., Am. J. Ophthalmol., 122 (1996) 255. — 11. FOX, G. M., H. W. FLYNN, J. L. DAVIS, W. CULBERTSON, Am. J. Ophthalmol., 114 (1992) 708. — 12. LUDVALL, A., C. ZETTERSTROM, Br. J. Ophthalmol., 84 (2000) 620. — 13. LAM, L. A., C. Y. LOWDER, G. BAERVELDT, S. D. SMITH, E. I. TRABOULSI, Am. J. Ophthalmol., 135 (2003) 722. — 14. BENEZRA, D., E. COHEN, Ophthalmology, 107 (2000) 1255. — 15. OKHRAVI, N. S., L. LIGHTMAN, H. M. TOWEL, Ophthalmology, 106 (1999) 710. — 16. PROBST, L. E., E. J. HOLLAND, Am. J. Ophthalmol., 122 (1996) 161. — 17. PAIKOS, P., M. FOTOPOULOU, M. PAPATHANASSIOU, P. CHOREFTAKI, G. SPYROPOULOS, J. Pediatr. Ophthalmol. Strabismus, 38 (2001) 16.

I. Petric

University Department of Ophthalmology, Clinical Hospital »Systers of Mercy«, Vinogradska 29, 10000 Zagreb
e-mail: ivankapetric@hotmail.com

OPERACIJA KATARAKTE S UGRADNJOM INTRAOKULARNE LEĆE KOD DJECE S JUVENILNIM REUMATOIDNIM ARTRITISOM

SAŽETAK

U ovom radu analizirali smo postoperativne rezultate šestero djece (7 očiju) s dijagnosticiranim juvenilnim reumatoidnim artritisom kod kojih je operirana katarakta s ugradnjom intraokularne leće u razdoblju od siječnja 1998 do prosinca 2002. godine. Srednja dob djece u vrijeme operativnog zahvata bila je 8 godina (raspon 5 do 14 godina), dok je srednje vrijeme postoperativnog praćenja bilo 48 mjeseci (raspon 26 do 60 mjeseci). Kod petero djece preoperativno bila je provedena sistemska imunosupresivna i protuupalna terapija. Preoperativno glaukom bio je dijagnosticiran kod 3 djece, kod koje je učinjen kombinirani operativni zahvat: operacija katarakte i trabekulektomija s mitomicinom C. Postoperativna vidna oštrina kod sve djece bila je 0.5 i bolja. Kao postoperativna komplikacija u 5 slučajeva bilo je prisutno zamućenje stražnje kapsule, dok glaukom i cistoidni makularni edem bili su prisutni u jednom slučaju. Operacija katarakte s ugradnjom intraokularne leće kod djece uz dobru kontrolu preoperativne i postoperativne upalne reakcije može kao rezultat imati dobru rehabilitaciju vida.