

Surgical Treatment, Clinical Outcomes, and Complications of Traumatic Cataract: Retrospective Study

Valentina Lacmanović Lončar, Ivanka Petric

Eye Clinic, Sisters of Mercy University Hospital, Zagreb, Croatia

Aim. To analyze clinical outcomes and complications after traumatic cataract extractions because of post-traumatic lens opacification.

Methods. We performed a retrospective analysis of 24 eyes with traumatic cataract surgically treated between May 2000 and June 2003. Preoperative visual acuity, postoperative best corrected visual acuity, and preoperative, intraoperative, and postoperative complications were analyzed for all eyes.

Results. Most patients were young men, with preoperative visual acuity of 0.05-0.1, who underwent surgery between one and six months after the trauma. We found corneal scar in 5 eyes, rupture of the anterior capsule in 4 eyes, sphincter damage in 2 eyes, anterior synechiae in 3 eyes, iridodialysis in one eye, zonular loss in one eye, and macular scar in one eye. Mild or moderate postoperative complications occurred in 9 out of 24 cases. Visual acuity improved in 17 eyes. Seven out of 24 patients did not benefit from cataract surgery because of traumatic involvement of the retina and opacification of posterior capsule.

Conclusion. The majority of the eyes with traumatic cataract were safely rehabilitated with intraocular lens implantation.

Key words: cataract; cataract extraction; intraoperative complications; lens cortex, crystalline; lens implantation, intraocular; phacoemulsification

Cataract may be an early or late manifestation of ocular trauma. The two basic types of trauma-related lens abnormality are loss of transparency and loss of position. They may be combined and complicated by lens fragmentation or swelling. Traumatic cataract can be caused by nonmechanical (1,2), or mechanical factors (3,4).

There are two basic questions concerning the surgery of traumatic cataract: should primary or secondary cataract removal be performed and what is the most proper technique if the intervention is decided. The greatest benefit of primary cataract removal is the surgeon's ability to inspect the posterior segment otherwise blocked by lens opacity. In general, primary cataract removal is recommended if the lens is fragmented, swollen, or causing a pupillary block (5).

Advantages of secondary cataract removal are better visibility, better intraocular lens calculation, anterior segment reconstruction, and stabilization of a hemato-ocular barrier (5).

We retrospectively evaluated surgical treatment, clinical outcomes, and complications in 24 cases with a secondary extraction of a traumatic cataract.

Patients and Methods

Patients

We reviewed medical documentation of 24 patients in whom we performed a secondary removal of traumatic cataract. All patients were surgically treated at the Sisters of Mercy University Hospital, Zagreb, between May 2000 and June 2003. The median age of our patients was 25 years (range, 3-45). There were 19 male and 5 female patients. Injuries were caused mechanically by different objects, such as knife, toy, glass, bungee cord, wire, pencil, firecracker (6), and blunt trauma. Cataract surgery was done one to six months after the primary repair of corneal or scleral wound. Ten patients had a total cataract (Fig. 1), 10 patients had cortical, and 4 had subcapsular cataract. Intraocular lens power calculations were performed with the Sanders-Retzlaff-Kraff (SRK) II formula measurements on non-injured eye (7,8).

Ocular examination included best corrected preoperative visual acuity, assessed with a Snellen chart. Intraocular pressure was measured with a Goldman applanation tonometer (Nikon slit lamp NS-1, Tokyo, Japan) or Schiottz tonometer (Amman ophthalmic instruments, Liptingen, Germany). Slit-lamp biomicroscopic examination of the anterior segment was done after the pupils were dilated and the type of cataract was documented by location of the predominant type of opacity. Posterior segment was evaluated with an indirect ophthalmoscope as well as B-scan ultrasound to rule out vitreous hemorrhage and retinal detachment (9,10).

Surgery

Surgery was performed by the same surgeon in the local or general anesthesia. Phacoemulsification was performed in 4 cases and extracapsular cataract extraction (ECCE) in 20 cases. Intraocular lens was implanted in 22 cases (a rigid polymethyl

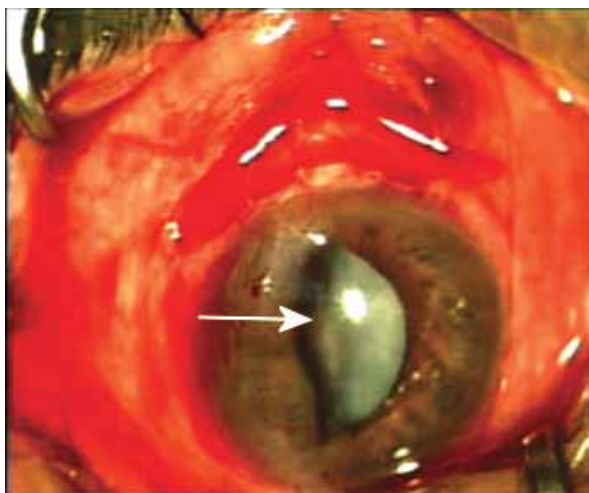


Figure 1. Total traumatic cataract (arrow) with a large corneal scar.

methacrylate [PMMA]; IOL Allergan PMMA 59, Irvine, CA, USA or AcrySof MA 60 BM IOL, Alcon, Forth Worth, TX, USA). We performed anterior vitrectomy with an Alcon Universal II (Alcon) in two cases with intraoperative posterior capsular rupture. Anterior vitrectomy was not performed in only one case. All patients received Dexamethasone (Krka, Novo mesto, Slovenija) subconjunctivally and Maxitrol (Alcon) ointment at the end of the procedure.

Follow Up

Topical Maxitrol solution was prescribed 5 times a day postoperatively with a gradual tapering, depending on the level of intraocular inflammation. All patients were followed daily for the first 5 days after the surgery, once a week for the first month after the procedure, and at monthly intervals for at least 12 months.

Outcome Measures

Visual acuity was recorded at each visit, slit-lamp biomicroscopic and posterior segment examination were done to record early postoperative complications (corneal edema, fibrinous anterior uveitis (11), raised intraocular pressure, hyphema) and late postoperative complications (posterior capsule opacification, pupil capture, intraocular lens decentration, and retinal detachment). Analysis was performed to compare the visual results, preoperative and postoperative complications.

Results

Preoperative Complications and Best Corrected Visual Acuity

Preoperative visual acuity ranged from light projection to 0.0125 in 12 patients and from 0.05 to 0.1 in other 12 patients. We encountered the following preoperative complications (Table 1): corneal scar because of a previous large corneal laceration, anterior capsular rupture, anterior synechiae, sphincter damage, iridodialysis, zonulle loss, vitreal hemorrhage, and macular scar.

Intraoperative Complications

Posterior capsular rupture, which was managed with vitrectomy, occurred in 2 cases. In a single case, vitrectomy was not performed after capsular rupture. Iris sutures were placed in 2 cases due to intraoperative sphincter rupture. Intraoperative hyphema was encountered in a single case (Table 1).

Table 1. Preoperative, intraoperative, and postoperative complications in 24 patients undergoing surgery for traumatic cataract

Complications	No. of patients
Preoperative:	
corneal scar	5
anterior capsular rupture	3
anterior synechiae	3
sphincter damage	2
iridodialysis	1
zonular loss	1
vitreous hemorrhage	1
macular scar	1
Intraoperative:	
posterior capsular rupture	3
iris sutures	2
hyphema	1
Postoperative:	
corneal edema	2
fibrinous uveitis	5
raised intraocular pressure	1
hyphema	1
posterior capsule opacification	4
pupil capture	1
decentration of intraocular lens	3
retinal detachment	1

Postoperative Complications and Best Corrected Visual Acuity

Early postoperative complications were corneal edema, fibrinous uveitis, intraocular pressure rise, and hyphema. Late postoperative complications were posterior capsule opacification, pupil capture (Fig. 2), intraocular lens decentration, and retinal detachment (Table 1).

Postoperative best corrected visual acuity ranged from 0.05 to 0.1 in 8 patients, and from 0.15 to 0.9 in 16 patients. Visual acuity in the first group could not be improved beyond 0.05-0.1 because of corneal scar and postoperative complications such as posterior capsule opacification, intraocular lens decentration, pupil capture, and retinal detachment in one case.

Corneal edema, intraocular pressure increase, and hyphema were transient requiring a short course of topical medical treatment. The most frequent early complication was fibrinous uveitis, which developed in 5 cases. Three children required intensive topical corticosteroid therapy in the immediate postoperative period. The most frequent late postoperative complication was posterior capsule opacification requiring an Nd:YAG laser posterior capsulotomy.

Discussion

Traumatic cataract in children (6) and adults is a common cause of unilateral visual loss, especially after penetrating injuries. In our study, only 4 patients were older than 30 years and majority were men. Bowman et al (8) reported similar findings regarding patient age.

Injuries of the eye occur mostly during children play (6) or in sport-related activities. Injuries are also often caused by a knife, toys, glass, bungee cord, wire, stick, pencil, or firecrackers (6).

Cataract surgery with intraocular lens implantation was performed 1-6 months after a primary repair of corneal or scleral wound following complete eval-



Figure 2. Pupil capture (arrow) as a late complication after traumatic cataract extraction.

uation of the damage to the intraocular structures by ancillary methods, such as B scan ultrasonography (9). Advantages of the secondary procedure are better visibility, better intraocular lens calculation, anterior segment reconstruction and, what is of great importance, stabilization of hemato-ocular barrier. Intraocular lens power calculation in an eye with a corneal laceration was performed on a fellow non-injured eye, because the mean central corneal power in the injured eyes was not different from that in the contralateral normal eyes (12). We performed two types of surgeries: extracapsular cataract extraction and phacoemulsification with implantation of intraocular lens in 22 cases. In 2 cases with intraoperative posterior capsular rupture, anterior vitrectomy was performed without intraocular lens implantation. Two types of intraocular lenses were implanted: PMMA and acrylic. Trivedi and al (13) reported good results with the implantation of acrylic intraocular lens.

Our study demonstrated that a majority of eyes with traumatic cataract could be safely rehabilitated with posterior chamber lens implantation. Postoperative best corrected visual acuity improved in 17 cases. In 7 cases, visual acuity could not improve beyond 0.1 because of postoperative complications. Blum at al (14) reported improved visual acuity in 90% of the cases, whereas Gain at al (15) concluded that postoperative visual acuity depended on complications. Gupta at al (16) also had good results in children with traumatic cataracts, who achieved visual acuity of 0.5 or better after the operation and intraocular lens implantation.

Fibrous uveitis is a common early postoperative complication in children, leading to posterior central synechias, pupillary block glaucoma, and lenticular membrane formation (11,16). To avoid these complications, patients received an intensive topical corticosteroid therapy in the immediate postoperative period, which was gradually tapered over 3-4 month period (17). Patients were examined frequently during the early postoperative period.

The most frequent late postoperative complication in our study was posterior capsule opacification,

mainly in children, requiring and Nd: YAG laser posterior capsulotomy. The incidence of posterior capsule opacification in children with traumatic cataract having cataract surgery with posterior chamber intraocular lens implantation has been reported to vary between 21% and 100% (18-21).

One case with retinal detachment required pars plana vitrectomy. After a five month follow-up, the retina was attached and visual acuity was 0.1.

In conclusion, the operation of traumatic cataract is a very demanding and delicate procedure. We reviewed clinical outcomes and complications in patients with a secondary extraction of a traumatic cataract. The majority of published papers reviewed their results and complications in patients with a primary extraction of a traumatic cataract. Many factors such as age, concomitant eye injury, intraocular lens implantation, preoperative, intraoperative, and postoperative complications, and the skill and experience of the surgeon are responsible for successful postoperative results.

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Correspondence to:

Valentina Lacmanović Lončar
Eye Clinic
Sisters of Mercy University Hospital
Vinogradska cesta 29
10000 Zagreb, Croatia
vlacmanovic@hotmail.com