

# Sclearal Tunnel Rupture Following Trauma 12 Years After Small Incision Cataract Surgery: Case Report

## Küçük İnsizyonlu Katarakt Cerrahisinden 12 Yıl Sonra Travmayı Takiben Skleral Tünel Rüptürü

Sertaç Argun KIVANÇ,<sup>a</sup>  
Berna AKOVA BUDAK,<sup>a</sup>  
Ahmet Tuncer ÖZMEN,<sup>a</sup>  
Sadık Görkem ÇEVİK<sup>b</sup>

<sup>a</sup>Department of Ophthalmology,  
Uludağ University Faculty of Medicine,

<sup>b</sup>Clinic of Ophthalmology,  
Şevket Yılmaz Training and  
Research Hospital,  
Bursa

Geliş Tarihi/Received: 05.10.2015  
Kabul Tarihi/Accepted: 14.06.2016

This study was presented as a poster at  
19<sup>th</sup> ESCRS Winter Meeting,  
20-22 February 2015, İstanbul, Turkey.

Yazışma Adresi/Correspondence:  
Sertaç Argun KIVANÇ  
Uludağ University Faculty of Medicine,  
Department of Ophthalmology, Bursa,  
TURKEY/TÜRKİYE  
sakivanc@gmail.com

**ABSTRACT** It has been shown that scleral tunnel incision is more secure than corneal incision in terms of wound sealing in cataract surgery. After trauma, scleral tunnel integrity may be disrupted long time after cataract surgery. We report herein a 75 year-old woman, that was referred to our department of ophthalmology with loss of vision and hemorrhagic discharge in her right eye following ocular trauma in a traffic accident. The visual acuity of the right eye was light perception and slit lamp biomicroscopy revealed diffuse subconjunctival hemorrhage, chemosis and total hyphema. She had scleral tunnel rupture and intraocular lens dislocation through the tunnel following ocular trauma. She had undergone cataract surgery and intraocular lens implantation by mini-nucleus technique 12 years ago.

**Keywords:** Cataract; sclera; wounds and injuries

**ÖZET** Katarakt cerrahisinde, skleral tünel insizyonunun yara yeri sızdırmazlığı açısından korneal insizyondan daha güvenilir olduğu gösterilmiştir. Travmayı takiben, katarakt cerrahisinden uzun zaman sonra skleral tünel bütünlüğü bozulabilir. Biz, bu yazıda trafik kazası sonucu oküler travmayı takiben görme azlığı ve gözden kanlı akıntı gelmesi şikayeti ile kliniğimize başvuran 75 yaşındaki bir kadın hastayı bildirdik. Sağ gözde görme keskinliği ışık hissi seviyesinde idi ve biyomikroskopik muayenesinde yaygın konjunktiva altı hemoraji, kemozis ve total hifeması izlendi. Oküler travmayı takiben skleral tünel rüptürü ve skleral tünelden göz içi lens dislokasyonu mevcuttu. On iki yıl önce mini nükleus tekniğiyle katarakt cerrahisi ve göz içi lens implantasyonu yapılmıştı.

**Anahtar Kelimeler:** Katarakt; sklera; yaralar ve yaralanmalar

Wound sealing has been shown to be more secure in scleral tunnel incision than in clear corneal incision for cataract surgery. In addition, intraocular pressure was found to be more stable in immediate period after scleral tunnel incision than clear corneal incision despite wound hydration is not performed in scleral tunnel incision.<sup>1</sup> However, in case of trauma, scleral tunnel integrity may be disrupted in late period after cataract surgery and serious ocular complications may occur. In literature, scleral tunnel rupture following trauma five years after manual small incision cataract surgery with subconjunctival IOL dislocation through the tunnel was reported.<sup>2</sup> We describe herein a case who had scleral tunnel rupture and IOL dislocation through the tunnel following ocular trauma



**FIGURE 1:** A. Preoperative diffuse subconjunctival hemorrhage, chemosis and total hyphema in the right eye. B. Postoperative first day: Triamcinolone residues in anterior chamber with localized corneal edema. C. Postoperative first week: Clear cornea with decreased edema. D. Postoperative first month: Stable scleral wound.

(See color Figure at <http://www.turkiyeklinikleri.com/journal/oftalmoloji-dergisi/1300-0365/tr-index.html>)

who had undergone mini-nucleus cataract surgery and IOL implantation 12 years ago.<sup>3</sup>

## CASE REPORT

A 75 year-old woman was referred to our ophthalmology department with loss of vision and hemorrhagic discharge in her right eye following ocular trauma in a traffic accident. The patient did not recall how her eye had been injured. She had undergone an uneventful small incision cataract surgery with mini-nucleus technique with in the bag polymethyl methacrylate (PMMA) IOL implantation in our department 12 years ago that was evident from the medical record of the patient. The visual acuity of the right eye was light perception and slit lamp biomicroscopy revealed diffuse subconjunctival hemorrhage, chemosis and total hyphema (Figure 1A). The globe was hypotonic, therefore an urgent surgical exploration was planned. During the surgery, it was noted that in the superior subconjunctival area, IOL optic with one of the haptics was dislocated through the pre-

vious scleral tunnel incision site. After conjunctival incision, dislocated IOL was extracted through the ruptured tunnel and the tunnel was closed with interrupted 10/0 nylon sutures. Triamcinolone-assisted anterior vitrectomy was performed for removal of hyphema and vitreus in the anterior chamber. On the first day postoperatively, the globe was normotone with intact sutures and some triamcinolone residues were noted in the anterior chamber with corneal edema inferiorly with a localized Descemet's membrane detachment (Figure 1B). The first week visit revealed a clear cornea with normal fundusoscopic findings (Figure 1C). After a month, (Figure 1D), intraocular pressure was 16 mmHg with stable wound integrity. The visual acuity was 20/200 with +10 D correction. Scleral fixated IOL implantation was planned since there was no capsular support.

## DISCUSSION

Cataract is one of the main causes of visual impairment and blindness in elderly patients; and cataract

surgery is one of the most commonly performed surgeries in elderly people with great success.<sup>4,5</sup> At the end of the 20<sup>th</sup> and beginning of the 21<sup>st</sup> century, old techniques such as mini-nucleus cataract surgery with scleral tunnel incision or extra/intra capsular cataract surgery (ECCE/ICCE) with clear corneal incision were popular.<sup>3,6,7</sup> Patients who underwent cataract surgery with these old surgical techniques in their early 60`s are now in elderly population. Geriatric people are more prone to fall and accidents because of walking and balance problems, and this kind of accidents may result in ocular trauma that causes dehiscence of the cataract wound.<sup>8-10</sup> Fall-related open globe injuries are seen in women and elderly patients more frequently.<sup>9-12</sup>

It was reported that 14% of open globe injuries are related with falling and 64 % of the all patients were 65-year-old and older.<sup>11</sup> There are many studies about eye injuries that had occurred days or many years after extracapsular cataract surgery (ECCE) and IOL implantation.<sup>12</sup> Kloek et al. reported that 7% of open globe injuries were because of dehiscence of cataract wound; and 89% of these injuries were in patients that had cataract surgery by ECCE.<sup>10</sup> In a recent study, of 26 patients with fall-related pseudophakic open globe injury (mean age was 81 years) sixty two had cataract surgery by phacoemulsification, 38% by ECCE.<sup>9</sup> However, both studies did not report any scleral tunnel incision technique. Small incisions are theoretically more resistant to traumas.<sup>12</sup> Probably ECCE incisions are more vulnerable than small incisions. However a case report indicated that without proper wound design clear corneal cataract inci-

sion might rupture with minor trauma.<sup>13</sup> According to anterior segment optical coherence tomography findings, both scleral and corneal incisions closed within thirty minutes postoperatively without any leakage.<sup>14</sup> Experimental studies on rabbit eyes, suggested that 7 days after cataract surgery, the number of fibroblastic cells were higher on the scleral incision than on the corneal incision.<sup>15</sup> It was shown in human subjects that the scleral incision was undetectable at postoperative 7 days by ultrasound biomicroscopy.<sup>16</sup> Self sealing sclero-corneal tunnel incision as described by Blumenthal in mini-nucleus cataract surgery has been reported to have higher resistance to trauma.<sup>3,17,18</sup> Traumatic wound dehiscence after cataract incision has been mostly reported in cases without small incision technique.<sup>19</sup> The longest reported interval between small incision cataract surgery and scleral tunnel rupture after trauma was 5 years.<sup>2</sup> Therefore, it is noteworthy that scleral tunnel may dehiscence following blunt trauma 12 years after small incision cataract surgery as in our case.

Visual prognosis is poor in geriatric patients with open globe injuries because of cataract wound dehiscence after ocular traumas.<sup>9,10</sup> Our case shows that even after a decade of small incision cataract surgery, the scleral tunnel incision site may rupture after blunt ocular trauma.

#### **Conflict of Interest**

*Authors declared no conflict of interest or financial support.*

#### **Authorship Contributions**

*All authors contributed equally to this study.*

## REFERENCES

- Hayashi K, Tsuru T, Yoshida M, Hirata A. Intraocular pressure and wound status in eyes immediately after scleral tunnel incision and clear corneal incision cataract surgery. *Am J Ophthalmol* 2014;158(2):232-41.
- Joshi RS. Sub-conjunctival dislocation of posterior chamber intra-ocular lens: five years after manual, small-incision cataract surgery. *Nepal J Ophthalmol* 2014;6(11):91-4.
- Blumenthal M. Manual ECCE, the present state of the art. *Klin Monbl Augenheilkd* 1994;205(5): 266-70.
- Olcaysü OO, Kıvanç SA, Altun A, Çinici E, Altınkaynak H, Ceylan E. Causes of Disability, Low Vision and Blindness in Old Age. *Turkish Journal of Geriatrics* 2014;17(1):44-9.
- Demir MH, Çınar FGY, Acar U, Örnek F. [Outcomes of cataract surgery in 90-year-old or older patients]. *Turkish Journal of Geriatrics* 2011;14(3): 220-4.
- Eichenbaum JW. Trends in cataract surgery. *Bull N Y Acad Med* 1992;68(3):367-89.
- Allen D, Vasavada A. Cataract and surgery for cataract. *BMJ* 2006;333(7559):128-32.
- Uz Tunçay S, Özdiğler AR, Erdinçler DS. [The effect of risk factors for falls on activities of daily living and quality of life in geriatric patients]. *Turkish Journal of Geriatrics* 2011; 14(3):245-52.
- Kavoussi SC, Slade MD, Meskin SW, Adelman RA. Characteristics and outcomes of fall-related open-globe injuries in pseudophakic patients. *Clin Ophthalmol* 2015;9:403-8.
- Kloek CE, Andreoli MT, Andreoli CM. Characteristics of traumatic cataract wound dehiscence. *Am J Ophthalmol* 2011;152(2):229-3.
- Emami-Naeini P, Ragam A, Bauza AM, Soni N, Langer P, Zarbin MA, et al. Characteristics, outcomes, and prognostic indicators of fall-related open globe injuries. *Retina* 2013;33(10): 2075-9.
- Routsis P, Garston B. Late traumatic wound dehiscence after phacoemulsification. *J Cataract Refract Surg* 2000;26(7):1092-3.
- Hurvitz LM. Late clear corneal wound failure after trivial trauma. *J Cataract Refract Surg* 1999;25(2):283-4.
- Hayashi K, Tsuru T, Yoshida M, Hirata A. Intraocular pressure and wound status in eyes immediately after scleral tunnel incision and clear corneal incision cataract surgery. *Am J Ophthalmol* 2014;158(2):232-41.
- Hirasaka T. [Corneoscleral wound healing after self-sealing cataract surgery--4. Scleral incision vs. corneal incision]. *Nippon Ganka Gakkai Zasshi* 1995;99(7):770-7.
- Hikichi T, Yoshida A, Hasegawa T, Ohnishi M, Sato T, Muraoka S. Wound healing of scleral self-sealing incision: a comparison of ultrasound biomicroscopy and histology findings. *Graefes Arch Clin Exp Ophthalmol* 1998; 236(10):775-8.
- Ernest PH, Kiessling LA, Lavery KT. Relative strength of cataract incisions in cadaver eyes. *J Cataract Refract Surg* 1991;17 Suppl:668-71.
- Ernest PH, Lavery KT, Kiessling LA. Relative strength of scleral tunnel incisions with internal corneal lips constructed in cadaver eyes. *J Cataract Refract Surg* 1993;19(4):457-61.
- Chowers I, Anteby I, Ever-Hadani P, Frucht-Pery J. Traumatic wound dehiscence after cataract extraction. *J Cataract Refract Surg* 2001;27(8):1238-42.