CASE REPORT

An excellent anatomical and visual recovery after surgical repair of an open eye injury with poor baseline prognostic factors

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ABSTRACT

Presently described is case of a 42-year-old woman with eye injury that was result of gunshot fired by a man at a wedding celebration. Bullet penetrated inferior quadrant of nasal sclera of left eye 7–12 mm behind limbus. Choroid and vitreous were prolapsed around bullet. Hemorrhage, vitreous prolapse and lens subluxation were present in anterior chamber. Presenting visual acuity (VA) was hand motion. Bullet 14x5 mm in size was carefully extracted from the eye. Fifteen days later, argon laser photocoagulation was performed on retina in area of bullet entry point. VA was 20/25 (Snellen) at final visit. In this case, although foreign body was large, area of penetration was Zone III, and initial VA was poor, early and appropriate surgical repair achieved integrity of the globe and good vision prognosis.

Keywords: Bullet; intraocular foreign body; ocular trauma.

INTRODUCTION

Open-globe injuries are one of the main causes of enduring visual impairment and blindness. Estimated incidence rate is 3.5 per 100,000 persons per year worldwide.[1] Birmingham Eye Trauma Terminology classifies ocular lesions caused by intraocular foreign body (IOFB) separately from other open-globe injuries due to different properties and prognosis.[2] Eye injuries accompanied by IOFB involvement of posterior segment and laceration occurring in Zone III are poor prognostic factors.[3,4] However, in recent studies these criteria have become controversial.[5] High quality images from orbital computerized tomography (CT) can visualize localization of inorganic IOFB, and success of trauma surgery is increased with early surgical intervention.

CASE REPORT

A 42-year-old woman presented at emergency clinic with complaint of decreased vision in the left eye as result of gunshot that occurred 1 hour before our examination. After a man fired a gun to celebrate a wedding, the bullet ricocheted off a wall and struck the woman in the left eye. Bullet had penetrated inferior nasal sclera of the left eye 7–12 mm behind limbus (Zone III) at level of 7 o'clock. One end of bullet was in the vitreous cavity and the other was lodged in the left inferior eyelid. At site of entry to globe, choroid and vitreous were prolapsed (Figure 1a, b). Patient visual acuity (VA) was hand motion. In anterior chamber, hemorrhage and vitreous prolapse were present. Lens was clear and subluxated, and red reflex of the fundus was absent. Oral nutrition was halted, and tetanus prophylaxis and intravenous 1 gr sefazolin sodium were administered to the patient. Orbital computed tomography (CT) was performed and localization of IOFB in the eye was identified (Figure 2a). Surgery was performed 6 hours after injury occurred under general anesthesia. After sterile conditions were obtained, the eye was covered with sterile eye drape. Conjunctiva was widely excised. Medial rectus muscle was accessed and limits of scleral laceration were identified. The part of the bullet buried in the lower eyelid was released with small, careful incisions. Bullet was slowly and patiently extracted from the sclera without applying too much traction. Size of the bullet was 14x5 mm (Figure 1b). Prolapsed vitreous and choroid around scleral entry site were gently cut with scissors. After making certain that no vitreous was trapped, sclera and conjunctiva were sutured with 8–0 vicryl suture. Postoperatively, topical prednisolone acetate 1% 8x1, moxifloxacin 0.5% 8x1, cyclopentolate hydrochloride 1.5% 3x1, oral ciprofloxacin 750 mg 2x1, and methylprednisolone 64 mg were administered. Oral

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Ulus Travma Acil Cerrahi Derg
2017;23(2):167–169
doi: 10.5505/tjtes.2016.23790

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ciprofloxacin was discontinued after 1 week. Topical and oral steroid therapies were tapered back to zero in 4 weeks and 2 weeks, respectively. Topical cycloplegic and moxifloxacin therapies were halted in 3 weeks. In postoperative second week, vitreous hemorrhage decreased and argon laser photocoagulation was performed on inferior nasal retina around site of bullet entry. In postoperative follow-up period, fibrinoid reaction and hemorrhage in anterior chamber was resorbed, vitreous in the pupillary interspace disappeared, and lens returned to its normal location. Posterior synechia developed at 7 o'clock position (Figures 3a, b). One week after surgery, VA was 20/100 in the left eye and at postoperative 1 month had improved to 20/25. Excellent globe integrity was achieved despite magnitude of the injury. (Figures 2b, 3a, b). During regular follow-up for 1 year there was no change in VA or ocular findings. At first year follow-up, VA

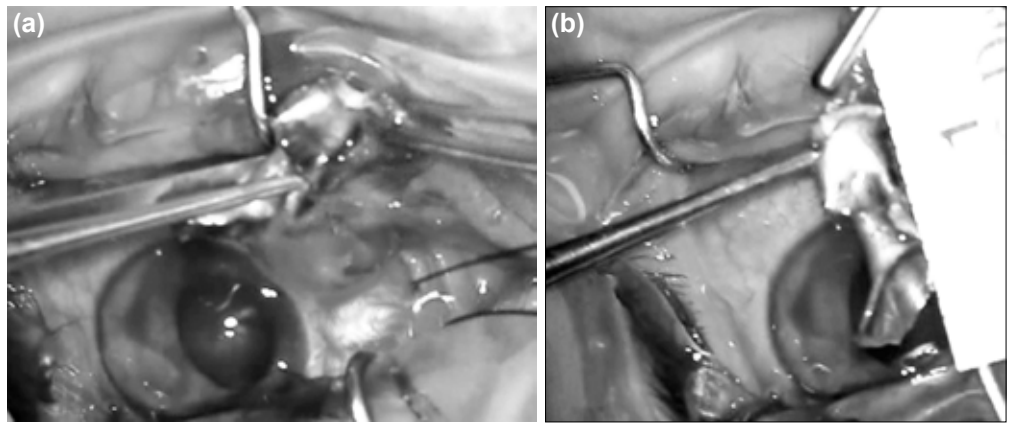


Figure 1. (a) Careful removal of the bullet. **(b)** Illustration of size of the bullet removed.

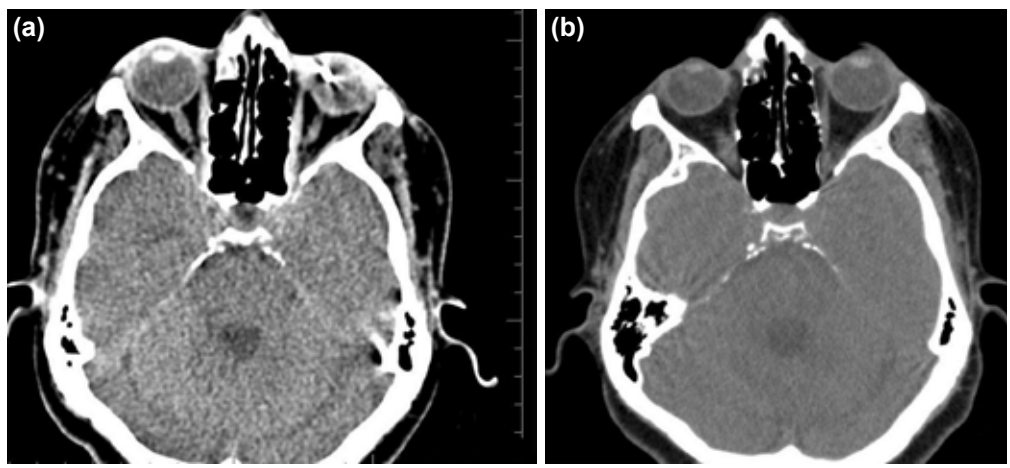


Figure 2. (a) Preoperative CT image indicating large metallic intraocular foreign body in the left eye. **(b)** Postoperative CT image illustrating integrity of the left eye globe.

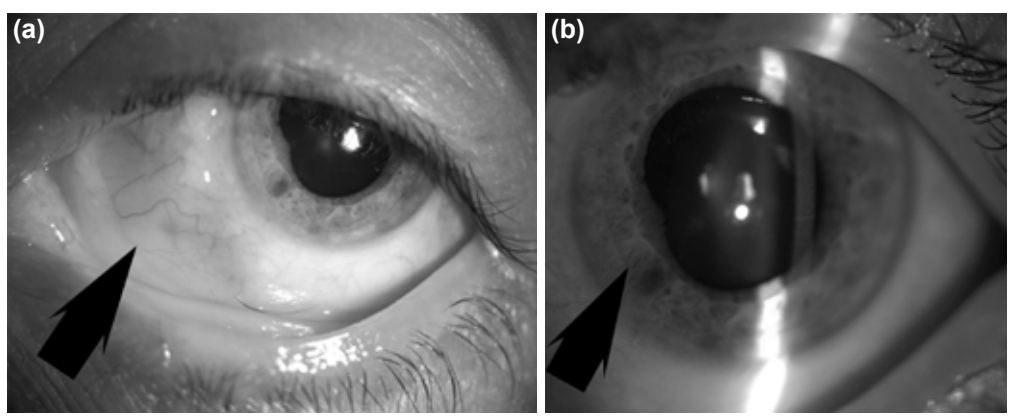


Figure 3. (a) Healed site of scleral and conjunctival wound at bullet entry point. **(b)** Posterior synechia occurred at 7 o'clock position and lens returned to its normal position. Clear anterior chamber is seen following resorption of vitreous and hemorrhage.

was 20/25 and intraocular pressure was 11 mmHg. There was no change in anterior segment findings. Fundus examination revealed laser spots in inferonasal area of the retina while remainder of the retina was normal.

DISCUSSION

In many of the studies that have tried to determine prognostic factors of eye injuries, authors have stated that prognosis is poor for posterior segment traumas with IOFB, especially depending on the size of the IOFB.[3,4] Valmaggia et al.[5] studied location of retinal lesion, initial VA, ocular trauma score,[6] and area of the eye where IOFB penetration occurred as prognostic factors, and found that macular lesion is mostly associated with low final best corrected visual acuity (BCVA). In the present case, bullet was lodged in the sclera, positioned such that half of the object was in the vitreous cavity and the other half outside the sclera in the lower eyelid. Although it was large, bullet did not hit the eye with full impact, indicating that bullet entered the eye at relatively slower speed. This milder impact probably helped to preserve macula from deep trauma, which in turn, affected final VA achieved. In contrast to many studies,[7] Valmaggia et al. stated that initial VA is not the most reliable predictive factor for final BCVA. Similarly, in this case, in spite of bad prognostic factors such as initial bad VA, large metallic IOFB (14x5 mm) and penetration located in Zone III, final VA of the patient was 20/25. This excellent anatomical and visual recovery may also be result of early medical treatment and surgical repair. Guidance of orbital CT in determining location of IOFB, gentle movements during surgery with little vitreous traction, no vitreous or choroid tissue loss, and unaffected macular anatomy and function may have also contributed to the result. Trauma score is a guide for the surgeon to estimate surgical success. However, it is not logical to abandon traumatized eyes with high trauma score. All efforts should be made for appropriate and early surgical intervention in these situations because final VA in a traumatized patient cannot be estimated without information about macular anatomy and function.

Acknowledgements

This case report was not supported by any company. None of the authors has financial or proprietary interests in any material mentioned. These data have not previously been published.

Conflict of interest: None declared.

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OLGU SUNUMU - *ÖZET*

Kötü başlangıç prognostik faktörlere sahip açık göz yaralanmasında cerrahisi sonrası mükemmel anatomik ve görsel iyileşme

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Bu yazıda, düğün töreni sırasında ateşlenen mermi ile göz yaralanması oluşan 42 yaşındaki kadın hasta sunuldu. Mermi çekirdeği, sol göz nazal skleranın alt kadranında, limbusun 7–12 milimetre arkasını delmişti. Koroid ve vitreus çekirdeğin etrafına prolabeydi. Ön kamarada kanama, vitreus prolapsusu ve lens subluksasyonu mevcuttu. Başvuru anındaki görme keskinliği el hareketi seviyesindeydi. 14x5 mm büyüklüğündeki mermi çekirdeği gözden dikkatlice çıkarıldı. On beş gün sonra, giriş alanı çevresindeki retinaya argon lazer fotokoagülasyon uygulandı. Hastanın son ziyaretindeki görme keskinliği 20/25 (Snellen) idi. Bu olguda, yabancı cisim büyük, penetrasyon alanı zon 3'de ve başlangıç görme keskinliği kötü olmasına rağmen, erken ve uygun cerrahi onarım göz küresinin bütünlüğü ve iyi görme prognozu sağlamıştır.

Anahtar sözcükler: İntraoküler yabancı cisim; mermi çekirdeği; oküler travma.

Ulus Travma Acil Cerrahi Derg 2017;23(2):167–169 doi: 10.5505/tjtes.2016.23790

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