

# Large intraocular foreign body extraction from cornea assisted with pars plana vitrectomy and polyglactin suture in two cases

San-Mei Liu, Xiu-Juan Zhao, Ying-Chuan Fan, Jie Zhong

Department of Ophthalmology, Sichuan Academy of Medical Sciences, Sichuan Provincial People's Hospital, Chengdu 610072, Sichuan Province, China

**Correspondence to:** Jie Zhong. Department of Ophthalmology, Sichuan Academy of Medical Sciences, Sichuan Provincial People's Hospital, Chengdu 610072, Sichuan Province, China. zjllxx1968@yahoo.com.cn

Received:2011-10-25 Accepted:2012-03-29

## Abstract

• **AIM:** To report the successful use of pars plana vitrectomy (PPV) and polyglactin suture to extract large intraocular foreign body (IOFB).

• **METHODS:** We report two cases of large IOFB extraction from cornea assisted with PPV and 7-0 polyglactin suture with computerized tomography scans and pictures of the IOFBs.

• **RESULTS:** Both cases underwent vitrectomy, lensectomy, intravitreal injections of 2.5mg Cefazidime and 1mg Vancomycin Hydrochloride, IOFB removal with 7-0 polyglactin suture via a limbal tunnel incision in the first case, and the original corneal laceration in the second. Laser endophotocoagulation was placed around the retinal break at the impact sites, with silicone oil tamponade in both cases. Inflammation was controlled, with successful anatomic restoration in postoperative follow-up.

• **CONCLUSION:** We describe, for the first time, removal of the large IOFBs with coil made with 7-0 polyglactin suture from cornea and to be an effective approach in removing large IOFBs without enlarging the sclerotomy to avoid severe and irreversible damage to the retina.

• **KEYWORDS:** intraocular foreign bodies; suture; trauma; vitrectomy

DOI:10.3969/j.issn.1672-5123.2012.05.02

Liu SM, Zhao XJ, Fan YC, Zhong J. Large intraocular foreign body extraction from cornea assisted with pars plana vitrectomy and polyglactin suture in two cases. *Guoji Yanke Zazhi (Int Eye Sci)* 2012;12(5):814-816

## INTRODUCTION

Intraocular foreign body (IOFB) causing ocular trauma is a significant and unique type of trauma that requires

skillful investigation and an early intervention. Endophthalmitis is an uncommon but potentially catastrophic complication of penetrating ocular injury with retained IOFBs<sup>[1]</sup>. In this article, we report 2 consecutive patients with large IOFBs resulted from penetrating ocular injuries and describe an unconventional technique for the removal of an IOFB that is too large to be grasped by intraocular forceps and does not float on perfluorocarbon liquids. By engaging the foreign body with suture and extracting it via a limbal incision or the original corneal laceration, one can hope to avoid further ocular damage.

## CASE REPORTS

**Case 1** A 31-year-old man was using a nail gun without eye protection when a broken nail penetrated his left eye. The patient reported immediate pain and decreased vision. Visual acuity was 20/20 OD and HM OS. Slit-lamp examination of the left eye showed eyelid swelling, subconjunctival hemorrhage, corneal edema, anterior chamber cell and keratic precipitates (KP). A traumatic cataract was present, and the fundus could not be visualized. Computerized tomography demonstrated a 11mm×3mm, linear, metallic foreign body penetrating the left globe and lodged in the vitreous cavity (Figure 1).

The patient underwent exploration of the wound, located around the insertion of the medial rectus, followed by globe repair with intravitreal injections of 2.5mg Cefazidime and 1mg Vancomycin Hydrochloride. This was followed 3 days later by pars plana vitrectomy (PPV), lensectomy, IOFB removal, and retina hole repair with 2.5mg of Cefazidime and 1mg of Vancomycin Hydrochloride injected intravitreally. At the four-week follow-up examination, best-corrected visual acuity was 20/400 OS with central scotoma due to a macular scar.

**Case 2** A 23-year-old man was injured by a rusted nail while working with a steel hammer in a construction site. The patient reported immediate pain and decreased vision. Visual acuity was 20/20 OD and HM OS. Slit-lamp examination of the left eye showed eyelid swelling, conjunctival congestion, corneal edema, an L-shaped penetrating wound in the center of the cornea, as well as anterior chamber cell and KP. A traumatic cataract was present, and the fundus could not be visualized. Computerized tomography showed a 16mm×2mm, linear, metallic foreign body perforating the left globe and embedded in the retina (Figure 2).

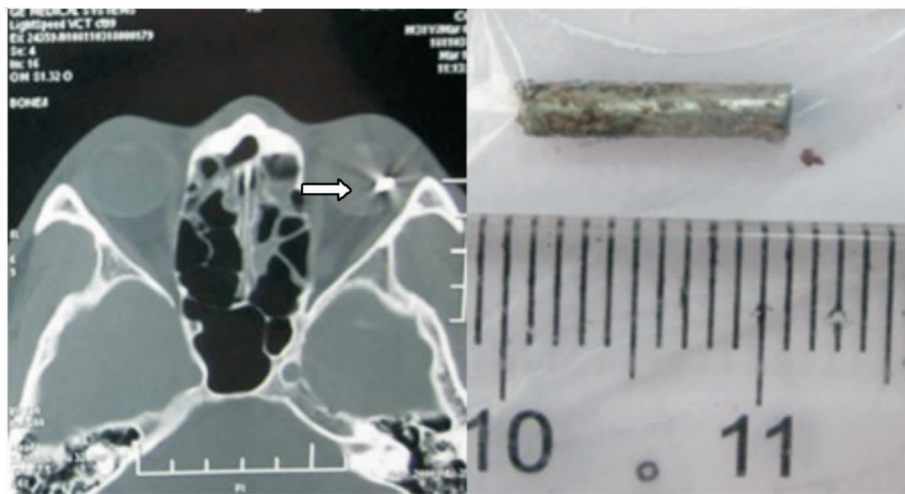


Figure 1 The computerized tomography scan of orbital and the picture of the foreign body of case 1.



Figure 2 The orbital 3D imaging of computerized tomography and the picture of the foreign body of case 2.

The patient underwent PPV, lensectomy, IOFB removal and retina repair and 2.5mg of Cefazidime and 1mg of Vancomycin Hydrochloride intravitreal injections. At the four-week follow-up visit, best-corrected visual acuity was 20/200 OS.

Both cases underwent standard 3-port PPV with excision of the crystalline lens and vitreous, with special attention to the turbid vitreous around the foreign body, and removal of the encapsulation membrane. A slipknot was fashioned with 7-0 polyglactin suture to make a coil, which was placed in the eye via a limbal tunnel incision in the first case, and the original corneal laceration in the second. One side of the foreign body was engaged, dislodging the foreign body from cornea with the help of optical fiber manipulated by the other hand. Laser endophotocoagulation was placed around the retinal break at the impact sites, with silicone oil tamponade in both cases. Inflammation was controlled, with successful anatomic restoration in postoperative follow-up.

#### DISCUSSION

Ocular trauma is the cause of blindness in approximately half a million people worldwide, and many more have suffered partial loss of sight. Trauma is often the most important cause

of monocular loss of vision, particularly in developing countries. Although most eye injuries are avoidable by simple preventive measures, many workers suffer visual impairment that can seriously hamper their psychosocial development. Usually the patients are young, facing a lifetime of limited vision or even blindness, with all the associated emotional, social, and economic cost to the patient, family, and society. Eye conditions are common in emergency departments. IOFBs are a frequent concern. Retained IOFBs may be well-tolerated and typically have minimal adverse effect on visual prognosis. They should be managed conservatively in the absence of specific indications for removal. Particles of iron or copper must be removed to prevent later disorganization of ocular tissues from toxic degenerative changes. Endophthalmitis following penetrating eye injuries has a relatively poor prognosis due to the underlying eye trauma and the frequency of more virulent organisms such as *Bacillus* species. Penetrating ocular trauma usually results in bacterial endophthalmitis.<sup>[2]</sup> Posttraumatic endophthalmitis<sup>[2]</sup> with IOFBs deserves great attention. Vitrectomy is suggested for the treatment of IOFBs and its complications, and should be performed as soon as possible. Removal of a retained IOFB

within 24 hours of injury markedly reduces the risk of infectious endophthalmitis development.

A study of 675 open globe injuries during 7.5 years showed that a standardized protocol including surgical repair by a dedicated eye trauma service and 48 hours of intravenous antibiotics was associated with a posttraumatic endophthalmitis percentage of less than 1%<sup>[3]</sup>. Conclusions from the Endophthalmitis Vitrectomy Study (EVS) remain a foundation for management of postcataract surgery endophthalmitis, notably prompt intravitreal antibiotic administration after vitreous sampling, with consideration for PPV in severe cases<sup>[4]</sup>. The surgical approach in IOFB removal from posterior segment has to be as immediate as possible. The two cases reported here underwent primary PPV and IOFB removal and intravitreal antibiotic injection. Inflammatory reaction was adequately controlled.

A large IOFB is more likely to inflict severe damage at the time of entry because of its higher kinetic energy, leading to a poor visual prognosis<sup>[5]</sup>. Intraocular forceps cannot grasp the large IOFB firmly, allowing it to slip and transmigrate. The visual outcomes achieved in the two cases may not have been possible if the foreign bodies were mobile, striking the fovea and damaging the retina. The foreign body also could be removed by suture or electromagnet from an enlarged sclerotomy, but this might increase eyeball disorganization. We practised complete vitrectomy and IOFB removal from a limbal incision or the original corneal laceration without enlarging the sclerotomy to avoid severe and irreversible damage to the adjoining tissues.

Most IOFBs are metallic in nature and found in males of productive age as a consequence of work-related accidents<sup>[6]</sup>. Ocular trauma remains an important cause of avoidable and, predominantly, monocular visual morbidity. Health education and safety strategies should be enacted for the prevention of the serious eye injuries in the traditional work, sports, and leisure environments and their related activities.

#### REFERENCES

1 Thompson JT, Parver LM, Enger CL, Mieler WF, Liggett PE. Infectious endophthalmitis after penetrating injuries with retained intraocular foreign bodies. *National Eye Trauma System, Ophthalmology* 1993;100(10): 1468-1474

2 Jiang CH, Zhang MN. Traumatic endophthalmitis following penetrating ocular injuries with retained intraocular foreign bodies. *Chin J Traumatol* 2003;6(3): 167-170

3 Andreoli CM, Andreoli MT, Kloek CE, Ahuero AE, Vavvas D, Durand ML. Low rate of endophthalmitis in a large series of open globe injuries. *Am J Ophthalmol* 2009;147(4):601-608. e2

4 Endophthalmitis Vitrectomy Study Group. Results of the endophthalmitis vitrectomy study: A randomized trial of immediate vitrectomy and of intravenous antibiotics for the treatment of postoperative bacterial endophthalmitis. *Arch Ophthalmol* 1995;113(11): 1479-1496

5 Wani VB, Al-Ajmi M, Thalib L, Azad RV, Abul M, Al-Ghanim M, Sabti K. Vitrectomy for posterior segment intraocular foreign bodies: visual results and prognostic factors. *Retina* 2003;23(5): 654-660

6 Murillo-Lopez SA, Perez A, Hernandez F, Suarez-Tata L, Magdalenic R, Fromow J, Dalma-Weiszhausz. Penetrating ocular injury with retained intraocular foreign body: epidemiological factors, clinical features and visual outcome. *Invest Ophthalmol Vis Sci* 2002;43(11): 3059

## 玻璃体切割联合缝线取出球内巨大异物2例

刘三梅,赵秀娟,樊映川,钟捷

(作者单位:610072 中国四川省,四川省医学科学院,四川省人民医院眼科)

作者简介:刘三梅,副主任医师,研究方向:玻璃体视网膜疾病方向。

通讯作者:钟捷,主任医师,研究方向:玻璃体视网膜疾病方向. zjllxx1968@yahoo.com.cn

#### 摘要

**目的:**报道利用玻璃体切割手术(pars plana vitrectomy, PPV)和缝线成功取出巨大球内异物(intraocular foreign body, IOFB)。

**方法:**在CT和球内异物的图片的指导下,采用玻璃体切割术联合7-0缝线取出球内巨大异物。

**结果:**两例都行玻璃体切割、晶状体切割、球内注射2.5mg头孢他啶和1mg万古霉素,第一例用缝线经角膜缘取出异物,第二例从角膜伤口处取出。视网膜裂孔周围行球内光凝,两例都填充硅油。术后随访,炎症都得到控制,成功地解剖复位。

**结论:**我们报道的为首例利用7-0缝线所做的圈套将球内异物经角膜取出,无需扩大巩膜切口从而避免了对视网膜造成严重的、不可逆的损害。

**关键词:**球内异物;缝线;外伤;玻璃体切割术