



Case report

Outcomes in bullous retinal detachment



Sarah P. Read, Ryan C. Young, Harry W. Flynn Jr. *

Department of Ophthalmology, Bascom Palmer Eye Institute, University of Miami Miller School of Medicine, Miami, FL, USA

ARTICLE INFO

Article history:

Received 6 September 2016
 Received in revised form
 27 November 2016
 Accepted 8 December 2016
 Available online 12 December 2016

Keywords:

Baseball trauma
 Retina sports injuries
 Traumatic giant retinal tear

ABSTRACT

Purpose: To report two patients with giant retinal tear (GRT) associated retinal detachment in the setting of baseball trauma.

Observations: Two patients presented with retinal detachment associated with GRT following blunt trauma with a baseball. The first was a superotemporal GRT detachment treated with scleral buckling, pars plana vitrectomy, endolaser, and silicone oil injection. He subsequently underwent cataract surgery with silicone oil removal and at two year follow up the retina was attached with best-corrected visual acuity of 20/20. The second case was an inferotemporal GRT detachment treated initially with laser demarcation, however the tear progressed to a retinal detachment that was then treated with pars plana vitrectomy and lensectomy, endolaser, perfluoro-octane (PFO), and silicone oil injection. At the one year follow up, the retina was attached and the best-corrected visual acuity was 20/30.

Conclusions and importance: GRTs are an uncommon cause of retinal detachment. While pars plana vitrectomy with tamponade is standard in GRT management, there is variability in the use of scleral buckling and PFO in these cases. This is in contrast to retinal dialysis where scleral buckle alone can yield favorable results. Though a baseball ocular trauma is common, retinal involvement is rare compared to other sports injuries such as those occurring with tennis, soccer and golf. Sports trauma remains an important cause of retinal injury and patients should be counseled on the need for eye protection.

© 2016 Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Giant retinal tears (GRTs) are defined as a retinal break greater than or equal to 3 clock hours.¹ GRTs are a relatively uncommon etiology of retinal detachment, in one study accounting for 4.7% of retinal detachments.² It is important to differentiate GRTs from retinal dialysis, as the surgical management often differs.^{2,3} GRTs involve a full thickness retinal break usually at the posterior vitreous base or adjacent to lattice. In contrast, retinal dialyses occur at the ora serrata. Here we present two case reports of GRT in the setting of baseball injury.

2. Findings

2.1. Case 1

A 36 year old male with an unremarkable family history presented for evaluation for acute loss of vision of the right eye

following blunt trauma with a baseball. His past medical and ocular histories were unremarkable. On examination, best-corrected visual acuity in the right eye was 8'/200 "E" and 20/20 in the left eye. External examination of the right eye revealed diffuse edema and ecchymosis of the upper and lower lids without laceration. Extraocular motility of the right eye was full. Slit lamp examination revealed a microhyphema of the anterior chamber with an eccentric, dilated pupil and an area of iridodialysis. Dilated fundus examination revealed vitreous and subhyaloid hemorrhage with a giant retinal tear superotemporally from the 9 to 12 o'clock position. The retinal detachment extended into the macula (Fig. 1A).

The patient was treated with scleral buckling, 23 gauge pars plana vitrectomy, endolaser and silicone oil injection with successful reattachment of the retina. The patient's retina remained attached and vision improved to 20/200 at four months post-operatively, but was limited by retained silicone oil and cataract formation. At 4 months post-operatively he underwent silicone oil removal with cataract extraction and posterior chamber intraocular lens placement. Best-corrected visual acuity (BCVA) was 20/20 at two years post-operatively (Fig. 1B).

* Corresponding author. 900 NW 17th Street Miami, Florida, USA.
 E-mail address: hflynn@med.miami.edu (H.W. Flynn).

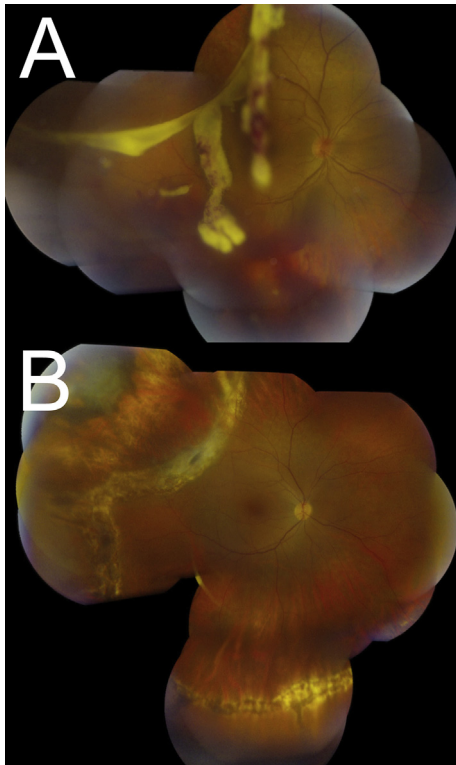


Fig. 1. Case 1 superotemporal giant retinal tear.

2.2. Case 2

A 24 year old male with an unremarkable family history presented for secondary evaluation following blunt trauma with a baseball. He was first evaluated at an outside retina practice, and a giant retinal tear was noted on examination inferotemporally from the 5 to 9 o'clock positions. This was initially treated with laser demarcation (Fig. 2A). On examination at our institution, best-corrected visual acuity in the right eye was 20/20–1 and 20/20 in the left eye. Slit lamp examination showed 360° sub-conjunctival hemorrhage. Dilated fundus examination revealed the above-noted giant retinal tear inferotemporally with adequate laser demarcation. On follow-up examination one week later, progression of the retinal detachment through the area of laser demarcation and encroaching upon the temporal macula was noted (Fig. 2B).

The patient was treated with pars plana lensectomy, vitrectomy with perfluoro-octane, membrane peeling, endolaser and silicone oil injection. BCVA was 20/70 post-operatively, and the silicone oil was removed five months post-operatively. The retina remained attached and BCVA was 20/30 + 2 with an aphakic contact lens at 6 months and one year post-operatively (Fig. 2C).

3. Discussion

Among retinal detachments, GRT are a relatively uncommon entity, associated with 0.5–8.3% of retinal detachments in a survey of published studies.⁴ While etiologies of GRT include iatrogenic, congenital, coloboma, aniridia, and myopia, ocular trauma comprised 22% of all GRT cases in one study.²

Baseball injuries are one of the most common cause of ocular injury of any individual sport.⁵ In a 1 year study conducted through the Major League Baseball Association, there were 24 eye injuries among professional baseball players.⁵ The most common injuries

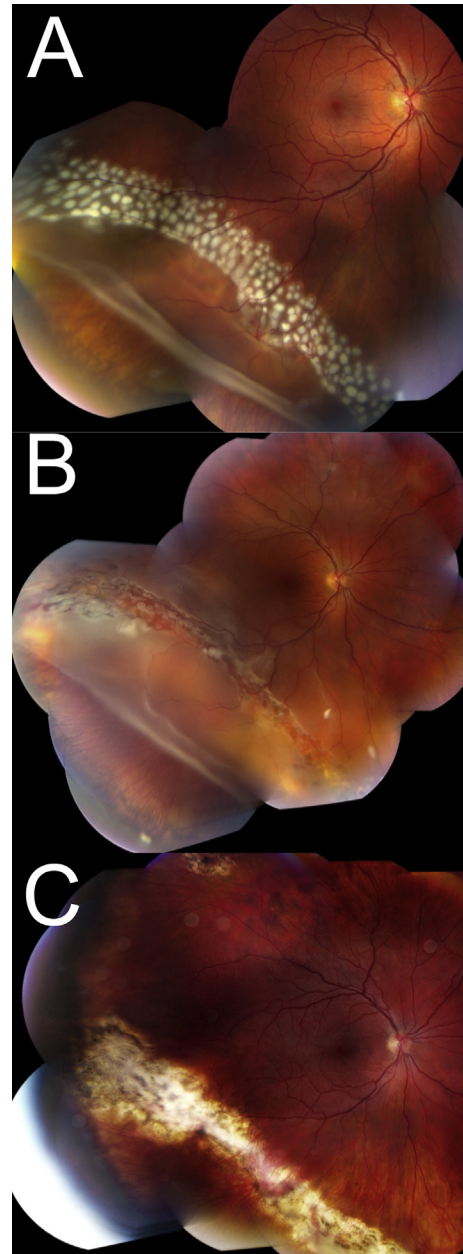


Fig. 2. Case 2 inferotemporal giant retinal tear.

were periorbital contusions and lacerations, corneal abrasion, and subconjunctival hemorrhage. Perhaps because of the relative protection from the orbital rim, though orbital trauma is common, retinal injury appears rare in baseball-related trauma compared to other blunt ocular trauma where the size of the projectile allows more direct contact between the ball and the globe.⁶ For example, though less common, golf related injuries often have a higher incidence of ruptured globe and enucleation, 51% and 33% respectively in one meta-analysis, though this may reflect a difference in age associated reflexes.⁷ Similarly tennis injuries are more likely to result in retinal tears and detachments.⁸

In these two patients with giant retinal tear caused by baseball injuries, management with pars plana vitrectomy with or without scleral buckling resulted in good anatomic and visual outcomes. The development of perfluoro-octane and wide field imaging have increased the efficacy of surgical intervention.⁴ In Case 2, but not

Case 1, perfluoro-octane was used during the course of surgery. The use of scleral buckle in addition to pars plana vitrectomy has remained controversial. While excellent anatomical success has been described without scleral buckle,⁹ other studies have reported that the absence of a scleral buckle is a risk factor for re-detachment.^{10,11} In Case 2 the patient was managed initially with laser demarcation alone. While there is little outcome data available on the use of laser retinopexy alone, treatment with pneumatic retinopexy has shown success in a small case series.¹² Though there is variability in the use of scleral buckle and PFO in these cases, these two cases highlight that treatment can be individualized to the patient and that multiple approaches can yield successful outcomes.

It remains important to distinguish GRT from retinal dialysis by careful examination of the break in relation to the vitreous base. While the posterior location of GRTs usually requires the use of vitrectomy to relieve vitreous traction, retinal dialysis can potentially be managed by scleral buckle alone.^{2,3} Both GRT and retinal dialysis are often associated with blunt ocular trauma and prevention with eye protection remains an important part of ocular safety. Currently the American Academy of Ophthalmology position statement on prevention of ocular injuries from baseball trauma includes eye protection that meets the American Society of Testing and Materials standards.

4. Patient consent

Consent to publish the case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

Acknowledgements and disclosures

Financial support

NIH Center Core Grant P30EY014801, an unrestricted grant to the University of Miami from National Eye Institute and Research to Prevent Blindness, New York, New York, USA.

Department of Defense: DOD- Grant #W81XWH-13-1-0048, an unrestricted grant to the University of Miami.

Conflict of interest

The following authors have no financial disclosures: SPR, RCY, HWF.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

36 year old male presenting with subhyaloid hemorrhage, giant retinal tear, and retinal detachment (A). The patient was treated with scleral buckle, pars plana vitrectomy and silicone oil injection with subsequent silicone oil removal with cataract extraction and best-corrected visual acuity was 20/25 (B).

24 year old male presented for secondary evaluation following traumatic giant retinal tear initially treated with laser demarcation (A). One week later, the patient had progression with a neurosensory retinal detachment through the area of laser demarcation (B). The patient was treated with pars plana lensectomy, vitrectomy with perfluoro-octane, membrane peeling, endolaser and silicone oil injection and best-corrected visual acuity was 20/30 + 2 with an aphakic contact lens at one year post-operatively (C).

Acknowledgements

None.

References

1. Ang GS, Townend J, Lois N. Epidemiology of giant retinal tears in the United Kingdom: the british giant retinal tear epidemiology eye study (BGEES). *Investigative Ophthalmol Vis Sci*. 2010;51:4781–4787.
2. Gonzalez MA, Flynn HW, Smiddy WE, Albin TA, Tenzel P. Surgery for retinal detachment in patients with giant retinal tear: etiologies, management strategies, and outcomes. *Ophthalmic Surg lasers imaging retina*. 2013;44:232–237.
3. Chang JS, Marra K, Flynn Jr HW, Berrocal AM, Arroyo JG. Scleral buckling in the treatment of retinal detachment due to retinal dialysis. *Ophthalmic Surg lasers imaging retina*. 2016;47:336–340.
4. Shunmugam M, Ang GS, Lois N. Giant retinal tears. *Surv Ophthalmol*. 2014;59:192–216.
5. Zigelbaum BM, Hersh PS, Donnenfeld ED, Perry HD, Hochman MA. Ocular trauma in major-league baseball players. *N. Engl J Med*. 1994;330:1021–1023.
6. Heimmell MR, Murphy MA. Ocular injuries in basketball and baseball: what are the risks and how can we prevent them? *Curr sports Med Rep*. 2008;7:284–288.
7. Crane ES, Kolomeyer AM, Kim E, Chu DS. Comprehensive review of golf-related ocular injuries. *Retina*. 2016;36:1237–1243.
8. Seelenfreund MH, Freilich DB. Rushing the net and retinal detachment. *Jama*. 1976;235:2723–2726.
9. Kreiger AE, Lewis H. Management of giant retinal tears without scleral buckling. Use of radical dissection of the vitreous base and perfluoro-octane and intraocular tamponade. *Ophthalmology*. 1992;99:491–497.
10. Goetzinne F, EC LAH, Berendschot TT, et al. Low redetachment rate due to encircling scleral buckle in giant retinal tears treated with vitrectomy and silicone oil. *Retina*. 2008;28:485–492.
11. Scott IU, Murray TG, Flynn Jr HW, Feuer WJ, Schiffman JC, Perfluoron Study G. Outcomes and complications associated with giant retinal tear management using perfluoro-n-octane. *Ophthalmology*. 2002;109:1828–1833.
12. Irvine AR, Lahey JM. Pneumatic retinopexy for giant retinal tears. *Ophthalmology*. 1994;101:524–528.