Retinal Detachment Associated With Basketball-Related Eye Trauma

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• PURPOSE: **Basketball is a popular sport involving significant body contact, which may frequently result in ocular trauma. The aim of this study was to evaluate the characteristics and visual outcomes of retinal detachment associated with basketball-related injury.**

• DESIGN: **Retrospective, interventional case series.**

• METHODS: **We reviewed the course of patients who sustained traumatic retinal detachment from basketball-related ocular trauma between 2003 and 2015.**

• RESULTS: **Thirteen patients were evaluated for basketball-related traumatic retinal detachment. Twelve (92%) were male and 1 (8%) female, with an average age of 18.2 years. The majority (9 of 13, 70%) of patients had moderate-to-high myopia, and none were using protective eyewear when they sustained the eye trauma. Rhegmatogenous retinal detachment was observed in all eyes. The preoperative mean visual acuity was 20/625 (range, hand motions to 20/20). Initial surgery using scleral buckling alone was performed in most (8 of 13, 62%) of the patients. Retinal reattachment was achieved in 10 (76%) eyes after the first operation and in 12 (92%) at the end of the intervention. The mean follow-up was 3.9 years (range, 4 months to 12 years). The visual acuity during last follow-up was 20/231 (range, light perception to 20/20). In the multivariable analysis, initial visual acuity was an independent factor affecting the final visual outcome ($P = .006$).**

• CONCLUSION: **Retinal detachment associated with basketball-related injury may cause severe visual loss. In the current study, all retinal detachments were of rhegmatogenous type and commonly occurred in young individuals with myopia. Initial visual acuity was associated with the prognosis. Risk awareness for early detection and intervention are important in these traumas. (Am J Ophthalmol 2017;180:97–101. © 2017 Elsevier Inc. All rights reserved.)**

AJO.com Supplemental Material available at AJO.com.

Accepted for publication May 30, 2017.

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BASKETBALL IS VERY POPULAR THROUGHOUT THE world. In Taiwan, basketball is one of the most popular sports, as well as jogging and cycling. Interest in this sport has been rising because of the recent appeal of "Linsanity."[1]

Basketball is a sport that emphasizes speed and power. Body contact is inevitable during the game, which increases the possibility of basketball-related injury. According to a recent epidemiologic study investigating sports and recreational injuries presenting to a tertiary emergency department, basketball-related injuries were reported to be the most prevalent (31.6%).[2] Ocular traumas sustained while playing basketball are common. A reported rate of 1.44 eye injuries per 1000 game exposures was found within a group of professional players.[3] Of these injuries, 50.9% were abrasions or lacerations to the eyelid, 28.8% were contusions to the periorbital area, and 11.9% were corneal abrasions. Of these injuries, ocular contusions, although ranked second, may be the type that are most commonly overlooked owing to the lack of apparent open wounds or the need for immediate surgical intervention. However, ocular contusions could pose a potential threat to the posterior segment of the eye and cause indirect injury by transmitted force from the impact site. Vision-threatening complications following this type of injury include vitreous hemorrhage, commotio retinae, retinal pigment epitheliopathy, macular hole, choroidal rupture and, most importantly, the formation of retinal breaks leading to retinal detachment.[4] The incidence of retinal detachment after contusion injury has been reported to be 9%[5] and can reach up to 16% if complicated by vitreous hemorrhage.[6]

Prompted by the lack of previous reports regarding retinal detachment associated with basketball eye trauma, our aim was to investigate the characteristics and the outcomes of basketball-associated traumatic retinal detachments.

METHODS

A RETROSPECTIVE CHART REVIEW OF PATIENTS WITH retinal detachment accompanying a history of basketball-related trauma between January 1, 2003 and March 31, 2015 was performed at the Kaohsiung Chang Gung Memorial Hospital (Kaohsiung City, Taiwan). Institutional Review Board/Ethics Committee approval was obtained.

0002-9394/$36.00
http://dx.doi.org/10.1016/j.ajo.2017.05.025

TABLE 1. Summary of Patient Characteristics From Basketball-Related Eye Trauma

Patient No.	Age	Sex	Eye	Clinical Presentation	Injury-to-Diagnosis Interval	Refraction (D)	Initial BCVA	Treatment	Final Anatomy[a]	Final BCVA[a]
1	22	M	OD	R-RD	3 months	−7.25	20/600	Scleral buckle, vitrectomy, silicone oil tamponade	Recurrent RD, PVR, attached after secondary operation	20/1000
2	14	M	OD	R-RD	1 month	−7.75	CF/>1 m	Scleral buckle	Retina attached	20/40
3	16	M	OD	R-RD and CD	1 week	0	HM/20 cm	Scleral buckle, vitrectomy, silicone oil tamponade	Recurrent RD, PVR, fail in reattachment after secondary operation, phthisis	No LP
4	14	F	OS	R-RD, retinal dialysis	1 month	−4.50	20/1000	Scleral buckle	Retina attached	20/200
5	20	M	OD	R-RD, giant tear	3 days	−7.0	CF/40 cm	Vitrectomy, silicone oil tamponade	Recurrent RD, PVR, attached after secondary operation	20/600
6	38	M	OD	R-RD	1 week	−2.0	20/20	Scleral buckle	Retina attached	20/20
7	16	M	OD	Subtotal RD	1 week	−5.0	CF/1 m	Scleral buckle	Retina attached	20/200
8	13	M	OS	R-RD, PVR	1 week	−9.5	CF/80 cm	Scleral buckle, vitrectomy, silicone oil tamponade	Retina attached, silicone oil removed	20/200
9	16	M	OS	Open funnel RD, PVR	1 year	−0.75	HM/50 cm	Vitrectomy, silicone oil tamponade	Retina attached	HM/1 m
10	14	M	OS	Subtotal RD	1 year	−2.0	CF/15 cm	Scleral buckle	Retina attached	20/1000
11	17	M	OD	R-RD	1 week	−5.75	20/60	Scleral buckle	Retina attached	20/25
12	16	M	OS	R-RD	2 days	−8.0	20/100	Scleral buckle	Retina attached	20/25
13	20	M	OD	R-RD	2 weeks	−8.25	20/50	Scleral buckle	Retina attached	20/25

BCVA = best-corrected visual acuity; CD = choroid detachment; CF = count finger vision; D = diopters; HM = hand motion vision; LP = light perception; PVR = proliferative vitreoretinopathy; RD = retinal detachment; R-RD = rhegmatogenous retinal detachment.
[a]Final anatomy and BCVA indicates the ocular findings during the latest follow-up.

The study adhered to the tenets of the Declaration of Helsinki. Data collected included patient demographics (age, sex, laterality, refraction data), presenting characteristics (diagnosis interval, type of injury, and type and location of retinal breaks), types of interventional treatment, and visual acuities preoperatively and postoperatively.

For statistical analysis, visual acuity was measured using the Snellen chart and converted to the logarithm of the minimum angle of resolution (logMAR) units. The following logMAR notation was used for nonnumerical visual acuities: count fingers (CF), 2.0; hand motion (HM), 2.3; light perception (LP), 2.7; and no light perception (NLP), 3.0. Multiple linear regression analysis was performed for factors associated with final visual outcome. The backward stepwise selection method was used to identify independent variables. SPSS version 10 (SPSS Inc, Chicago, Illinois, USA) was used, and a P value $< .05$ was considered to be statistically significant.

RESULTS

A TOTAL OF 13 EYES FROM 13 PATIENTS WHO HAD SUSTAINED a retinal detachment following eye trauma while playing basketball were included in the present study (Table 1). There were 12 male (92%) and 1 female (8%) patient, with a mean age of 18.2 years (range, 13–38 years; median, 16 years). Nine (70%) patients were injured by direct blunt contusion from the basketball; the other 4 (30%) were injured by different types of body contact (upper limbs, including hands, arms, or shoulder). All of them reported symptoms of blurry vision after the accident. None of them had worn protective eyewear during the sporting activity.

The mean duration between the basketball-related eye trauma and initial visit was 2.4 months (range, 0.1–12 months; median, 0.25 months) and 10 (77%) patients had their visit within 1 month; however, 2 (15%) presented after a delay of 1 year. At initial presentation, visual acuity was 20/20 in 1 (8%) eye, 20/25 to 20/200 in 3 eyes (23%), less than 20/200 to HM in 9 eyes (69%). The majority of patients (9 eyes, 69%) had moderate-to-high myopia. The average refractive error was −5.2 diopters (D) (range, 0 to −8.3 D), 6 (46%) patients had myopia greater than −6.0 D, 3 (23%) had myopia between −3.0 D and −6.0 D, and 4 (31%) had less than −3.0 D or showed no myopia. Furthermore, 1 patient with myopia of −7.0 D had a history of laser refractory surgery and was originally −20.0 D before the surgery.