Spor Hekimliği Dergisi, 57(4):210-212; 2022
Turkish Journal of Sports Medicine
Turk J Sports Med. DOI: 10.47447/tjsm.0660

Case Report / Olgu Sunumu

A sports injury to keep in mind, exercise band-induced ocular injury: A case report

Akılda tutulması gereken bir spor yaralanması, egzersiz bandı ilişkili oküler yaralanma: Olgu sunumu

Şensu Dinçer[1], Esin Nur Taşdemir[1], Ceylan Köksal[2], Armağan Filik[3]

[1]*Sports Medicine Department, İstanbul Faculty of Medicine, İstanbul University, İstanbul, Türkiye*
[2]*Sports Medicine Department, Şanlıurfa Training and Research Hospital, Şanlıurfa, Türkiye*
[3]*Optalmology Department, Patnos State Hospital, Ağrı, Türkiye*

ABSTRACT

Sports-related activities have been associated with numerous ocular injuries. A 37-year old female patient with ocular trauma associated with exercise band used during resistance exercise has been presented. While ocular injuries caused by the exercise band were rarely reported before the COVID-19 pandemic, number of those case reports has been increased during the last couple of years. Health professionals, trainers and athletes should be aware of potential ocular injuries caused by the elastic band and precautions should be taken.

Keywords: *Exercise band, ocular trauma, COVID-19*

ÖZ

Sportif aktivite sırasında birçok oküler yaralanma meydana gelebilir. Direnç egzersizi için kullanılan egzersiz bandı ile ilişkili oküler travma yaşayan 37 yaşında kadın hasta sunulmuştur. Egzersiz bandının neden olduğu oküler yaralanmalar, Covid-19 pandemisi öncesinde nadiren bildirilmişken, salgın sırasında elastik bantların kullanım sıklığının artmasıyla literatürde daha sık bildirilmiştir. Sağlık profesyonellerinin, eğitimcilerin ve sporcuların elastik bantların oküler yaralanmaya neden olabileceği konusunda farkındalığı sağlanmalı ve koruyucu önlemler alınmalıdır.

Anahtar Sözcükler: *Egzersiz bantı, oküler travma, COVID-19*

INTRODUCTION

Sports injuries, albeit mostly consisting of musculoskeletal injuries, include ocular injuries which must be taken into consideration due to their potential to cause blindness and high morbidity (1). The types of sports are classified as safe, low-risk, medium-risk and high-risk sports based on the possibility of eye injury within the literature (2). The first three branches where these injuries occur mostly are paintball, basketball and ice hockey (2). Resistance exercises are not listed in this category.

Exercise bands allow a cost-effective and efficient resistance exercising without any need for extra equipment. Studies have proven the efficiency of resistance exercises using exercise bands in especially muscular strength gains from young age groups to adults, sedentary individuals to elite athletes (3). Although this exercise is considered safe, high-tension, i.e. stretching 3 times more than the resting length (3), could cause injuries due to the exercise band coming off or loosening out of its secured spot hitting the eye in high speed. In this study, we present the case of a 37-year-old female patient who experienced ocular trauma related to an exercise band use during resistance exercise.

CASE REPORT

A 37-year-old female patient was hit in both eyes by an exercise band after the exercise band has snapped during exercise. The patient was admitted to the hospital for redness in eye and blurred vision. The requested eye consultation showed bilateral visual acuity 0.7 (30% sight impairment), normotonic bilateral intraocular pressure, normal bilateral eye movements and positive bilateral direct and indirect light reflexes. The biomicroscopic examination revealed superficial corneal epithelial defects, +4 cells in the anterior chamber, microscopic hyphema and pupillary fibrin membrane in the right anterior segment; corneal epithelial defects, +2 cells in the anterior chamber, microscopic hyphema and pupillary fibrin membrane in the left anterior segment. The dilated fundus examination presented *commotio retinae* (Berlin's edema) in the right posterior pole of

Received / Geliş: 29.12.2021 · **Accepted / Kabul:** 13.03.2022 · **Published / Yayın Tarihi:** 29.06.2022 · **Issue:** December 2022

Correspondence / Yazışma: Esin Nur Taşdemir · İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Spor Hekimliği Bölümü, İstanbul, Türkiye · esin.tasdemir@istanbul.edu.tr

Cite this article as: Dincer S, Tasdemir EN, Koksal C, Filik A. A sports injury to keep in mind, exercise band-induced ocular injury: A case report. *Turk J Sports Med.* 2022, 57(4):210-2; https://doi.org/10.47447/tjsm.0660

the eye. There was no abnormality in the left fundus. Edema was discovered in the bilateral upper eyelid during the macroscopic examination (Figure 1). Written informed consent was obtained from the patient.

Topical dexamethasone and cyclopentolate hydrochloride for the reaction in the anterior chamber, and artificial tears including topical netilmicin and Na-hyaluronic acid for the corneal epithelial defect were prescribed. The patient had perfect bilateral visual acuity (bilateral visual acuity 1.0), normotonic intraocular pressure, transparent cornea and clear anterior chambers at the follow up after 10 days. The fundus examination showed regressed commotio retinae in the right eye and no abnormality in the left fundus. No pathology was found and no sequela developed during the patient's following examinations.

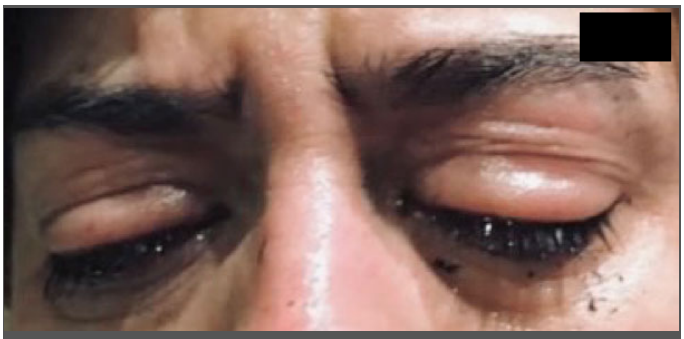

Figure 1. Face photography demonstrates bilateral upper eyelid edema

DISCUSSION

Ocular injuries related to sports can be divided into two as penetrant and blunt injuries based on the injury mechanism. Injuries occur more often through a blunt mechanism. Different types of interactions are involved in the process of an eyeball experiencing blunt trauma. Lesions develop at the point of impact with a “coup” mechanism. The lesions established across by the shock waves due to the impact are called “contrecoup” lesions (4).

In our case, the corneal superficial epithelial defects and edema in the upper eyelid were emerged due to the coup mechanism (5), whereas the commotio retinae occurred with the contrecoup mechanism (4). The post-traumatic compression of the eye in the anteroposterior axis and its expansion in the equatorial area would cause tension in the angle structures in the anterior chamber and consequently hyphema through tears in the iris stromal vascular structures and ciliary body veins (6).

Although there are only a limited number of studies about exercise band-induced ocular injuries within literature, the injury mechanism is similar in blunt traumas like our case. Before the COVID-19 pandemic, exercise band-related ocular injuries were reported as single cases or small case series involving lens dislocation, retinal detachment, macular holes and ruptured globe injuries (7,8). During the pandemic, Al-Khersan et al. reported a series of 11 patients (9). The fact that people who cannot go to the gym in a social isolation environment prefer home exercises with exercise bands, which are simple and easily accessible, may have caused this situation.

The use of exercise bands is considered to be a safe in general, however; they may cause injury to the eye by snapping in high speed under high pressure. Supporting this hypothesis, Litoff and Katalano measured three different elastic bands and found the maximum potential energy as 60.7 J, and the maximum speed as 74.3 m/s in their study (10). They have claimed this energy could cause ocular injury when the band snaps into the eye.

The health professionals should be alert that the exercise band may generate a high energy and cause a serious ocular injury. If such injuries are well-defined, they can be prevented with simple measures. Therefore, we believe it will be the most important step to put forward exercise band-induced ocular injuries as a type of sports/exercise injury and create awareness in order to prevent them.

It is stated in the literature that protective eyewear can be used to avoid such injuries. However, we recommend that it would be a more practical approach for health professionals (physicians and physiotherapists) and trainers to inform the individual of the use of exercise bands and to take basic security measures; such as choosing bands with the proper resistance and giving adequate information for safe practice to prevent ocular injuries.

CONCLUSION

The widespread use and popularity of the exercise bands due to easy accessibility in pandemic conditions may increase the risk of injury. Awareness of the possible risks of serious ocular injuries may have a positive effect on reducing the frequency of injuries. Exercise band-induced ocular injuries should be defined as a type of sports/exercise injury, thus, encouraging individuals to take basic security measures can be a practical approach in preventing ocular injuries.

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

Financial Disclosure / Finansal Destek

The authors received no financial support for the research and/or publication of this article.

Author Contributions / Yazar Katkıları

Concept: ŞD, ENT; Design: ENT, CK, AF; Supervision: ŞD,AF; Materials: CK, AF; Data Collections and Processing: ŞD, ENT, AF; Analysis and Interpretation: ENT, AF; Literature Review: All Authors; Writing Manuscript: ŞD, ENT; Critical Reviews: All Authors.

REFERENCES

1. Inam O, Acar U. Sporda görülen göz yaralanmaları. *Turk J Sports Med*. 2016; 51(1):11-19.
2. Vinger P. The mechanisms and prevention of sports eye injuries. 2018. Available at: http://www.worldbadminton.com/training/documents/The-Mech-and-Prev-of-Sports-Eye-Injuries. pdf . [Accessed 05 March 2022].
3. Page P, Ellenbecker T. *Strength band training*. 2nd ed. Champaign: Human Kinetics; 2011.
4. Wolter JR. Coup-contrecoup mechanism of ocular injuries. *Am J Ophthalmol*. 1963;56:785-96.
5. Pai SG, Kamath SJ, D'Souza S, Dudeja L. A Clinical Study of Blunt Ocular Trauma in a Tertiary Care Centre. *Online J Health Allied Scs*. 2013;12(2):10.
6. SooHoo JR, Davies BW, Braverman RS, Enzenauer RW, McCourt EA. Pediatric traumatic hyphema: a review of 138 consecutive cases. *J AAPOS*. 2013;17(6):565-67.
7. Joondeph SA, Joondeph BC. Retinal detachment due to CrossFit training injury. *Case Rep Ophthalmol Med.*2013;2013:189837. https://doi.org/10.1155/2013/189837.
8. Rosignoli LM, Regan KA, Gray MJ, Ohning CR, Iyer SSR. Exercise band-induced lens dislocations: A case series. *Am J Ophthalmol Case Rep.* 2019;15:100496. https://doi.org/10.1016/j.ajoc.2019.100496.
9. Al-Khersan H, Lazzarini TA, Kunkler AL, Laura DM, Fan KC, Zhang L, et al. Ocular trauma secondary to exercise resistance bands during the COVID-19 pandemic. *Am J Emerg Med.* 2021;42:217-220.
10. Litoff D, Catalano RA. Ocular injuries caused by elastic cords. *Arch Ophthalmol.* 1991;109(11):1490- 1.