DOI: https://doi.org/10.2298/SARH200619094B
UDC: 617.7-001.31


CASE REPORT / ПРИКАЗ БОЛЕСНИКА

# Uncommon severe blunt ocular injury associated with large retinal dialysis caused by a fishing sinker

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**SUMMARY**

**Introduction** Severe ocular injuries caused by fishing equipment are relatively rare. The visual prognosis for fishing-related injuries depends on the involved ocular structures, the presence of complications, and surgical techniques applied.

**Case outline** A 40-year-old man reported a sudden severe sharp pain and a loss of vision in his left eye while he was pulling the fishing rod during recreational fishing. At admission, his best corrected visual acuity (BCVA) of the left eye was 1/60. Clinical examination revealed a laceration in the temporal quadrant of the bulbar conjunctiva 0.2–0.3 mm in size and a dark tumefaction under the conjunctiva in the same region. It was identified during primary surgical exploration as a fishing sinker 1 cm in size lodged under the lateral rectus muscle. The bulbar wall was intact and the fishing sinker was safely removed. Phacoemulsification with the implantation of an artificial foldable intraocular lens and 23G pars plana vitrectomy were performed. During vitrectomy, subretinal hemorrhage in the macular region and large retinal dialysis in the temporal segment were revealed. Vitrectomy was finished with silicone oil tamponade. One week later, the patient's BCVA of the left eye was 2/60. Eight months after surgery, spontaneous resorption of subretinal hemorrhage in the macular region and the attached retina was observed. The patient's BCVA was 3/60 due to the destruction of photoreceptors and retinal pigment epithelium and the formation of epiretinal membrane.

**Conclusion** To our knowledge, this is the first case report of a severe blunt ocular injury associated with large retinal dialysis caused by a fishing sinker.

**Keywords:** ocular trauma; fishing sinker; subretinal hemorrhage; retinal dialysis; vitrectomy

## INTRODUCTION

Ocular injury is the main cause of visual morbidity and blindness in the adult-age population worldwide [1]. Numerous causes of eye trauma exist and sport-related injuries have been described in the literature. Fishing is a popular activity and usually no particular safety measures are undertaken. However, ocular traumas ranging from simple to severe can occur during recreational fishing. Severe eye injuries caused by fishhooks and other parts of fishing equipment are relatively rare. Cases of ocular injuries caused by fishhook are mostly reported and the severity of ocular injuries depends on the involved ocular structures. Various structures of the eye including the lid, conjunctiva, cornea, sclera, anterior chamber, lens, and the posterior segment structures may be affected in fishhook ocular injury. Possible complications of these injuries may involve the anterior and the posterior segment with partial or complete loss of vision and even loss of the eye in certain circumstances. Treatment of these injuries depends on the location of the injury, the involved ocular structures, and the type of fishhook or other parts of fishing equipment [2]. In cases when a metal foreign body is suspected, detailed examination of anterior and posterior segment structures of injured eye is required, including X-ray or computed tomography of orbits, as well as ultrasound examination [3].

We present an uncommon, very severe blunt eye injury associated with large retinal dialysis caused by a fishing sinker. We describe the unusual mechanism, severity, treatment, and clinical outcome of an injury that occurred during recreational fishing.

## CASE REPORT

A 40-year-old man was admitted at the Clinic for Eye Diseases after suffering trauma to his left eye during recreational fishing. On initial presentation, the patient reported a sudden severe sharp pain in his left eye and a loss of vision with a sensation of dark curtain coming down across his left eye that occurred while he was pulling the fishing rod.

The patient's best corrected visual acuity (BCVA) was 1.0 in the right eye and 1/60 in the left eye. Intraocular pressure in both eyes was 16 mmHg. Slit lamp examination of the anterior and posterior segment of the right eye was normal. Slit lamp examination of the left eye anterior segment showed suffusion and hyperemia of the bulbar conjunctiva with the presence of small laceration in the temporal

**Received • Примљено:** June 19, 2020
**Revised • Ревизија:** October 9, 2020
**Accepted • Прихваћено:** October 11, 2020
**Online first:** October 14, 2020

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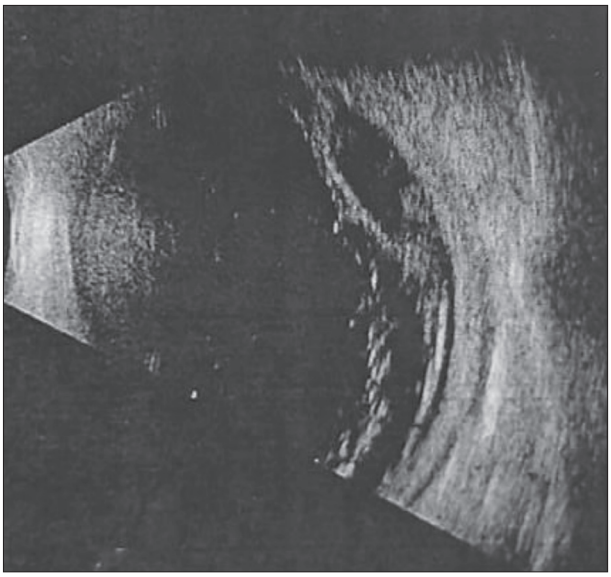

**Figure 1.** Ultrasound of the left eye shows the presence of mobile vitreous opacities of low to medium reflection (hemophthalmos), no echo signs of an intraocular foreign body, and the zone of high reflection of the detached retina

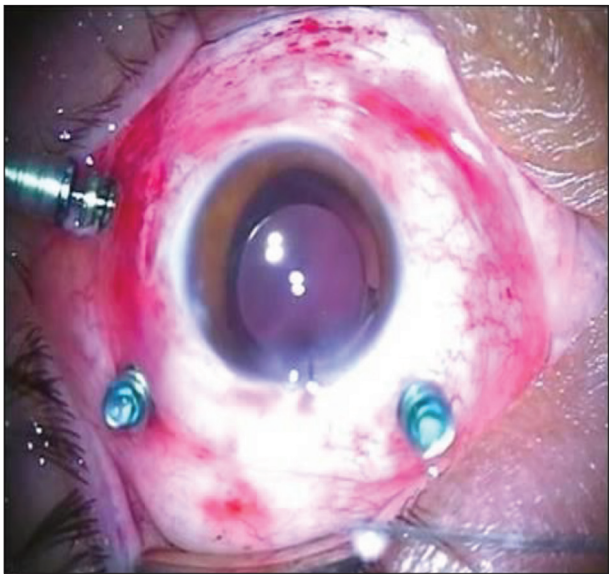

**Figure 3.** Implanted, artificial foldable intraocular lens and 3-port pars plana vitrectomy 23G system with the infusion line

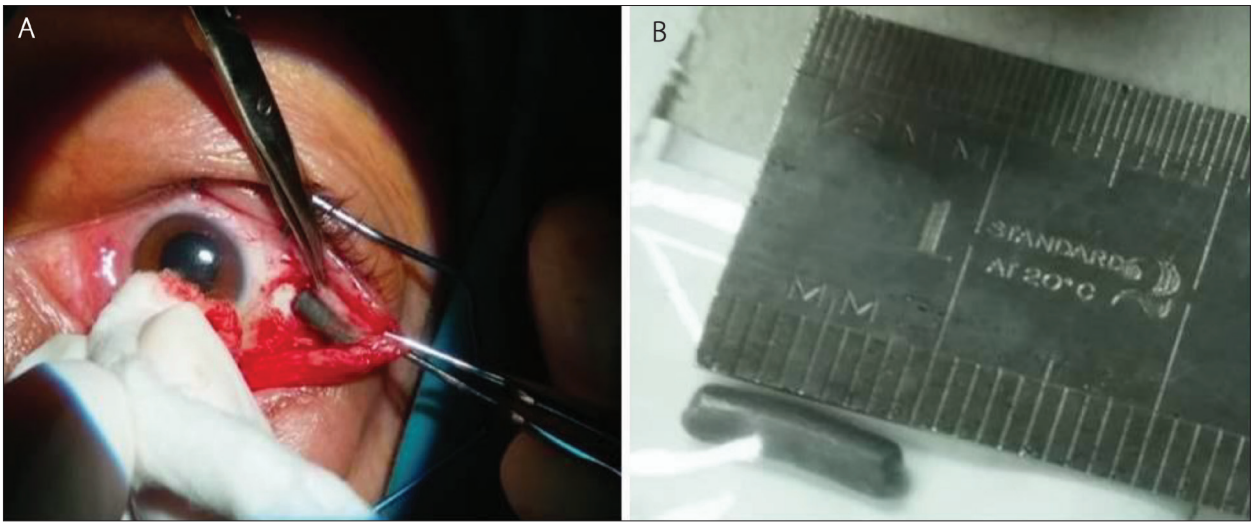


**Figure 2.** Intact bulbar wall and extracted fishing sinker during the primary surgical exploration (A); dimensions of the fishing sinker (B)

quadrant 0.2–0.3 mm in size. A dark tumefaction under the bulbar conjunctiva in the region of the small laceration in the lateral rectus muscle zone was observed. The cornea was intact, the anterior chamber was deeper and clear with traumatic mydriasis and slightly irregular pupil, with clear lens in the physiological position. The eye fundus examination demonstrated hemophthalmos. Ultrasound examination of the left eye revealed the presence of mobile vitreous opacities of low to medium reflection, the findings consistent to hemophthalmos, no echo signs of intraocular foreign body, and the zone of high reflection of the detached retina (Figure 1).

The presence of dark tumefaction in the zone of the lateral rectus muscle under the bulbar conjunctiva raised the suspicion of globe rupture with the prolapsed uveal tissue. Primary surgical exploration was done under local anesthesia. Intact bulbar wall and unexpected presence of a metal foreign body, a fishing sinker, under the lateral rectus muscle, 1 cm in size, were revealed. The fishing sinker was extracted (Figure 2). Phacoemulsification of the natural lens with the implantation of an artificial foldable intraocular lens (Figure 3) and 23G pars plana vitrectomy with silicone oil tamponade were performed. Following three-port sclerotomies at pars plana, at 3.5 mm from the limbus and the placement of the infusion line, "core" vitrectomy and removal of hemophthalmos were performed enabling the visualization of the fundus. Several pre-retinal hemorrhages, subretinal hemorrhage in the macular region and large retinal dialysis in the temporal segment were observed (Figure 4). In this segment, the retina appeared wrinkled, immobile, with irregular posterior border with attached vitreous and small quantity of subretinal fluid. Triamcinolone acetonide (Kenalog®) was applied in the vitreous for better visualization, especially in the zone of

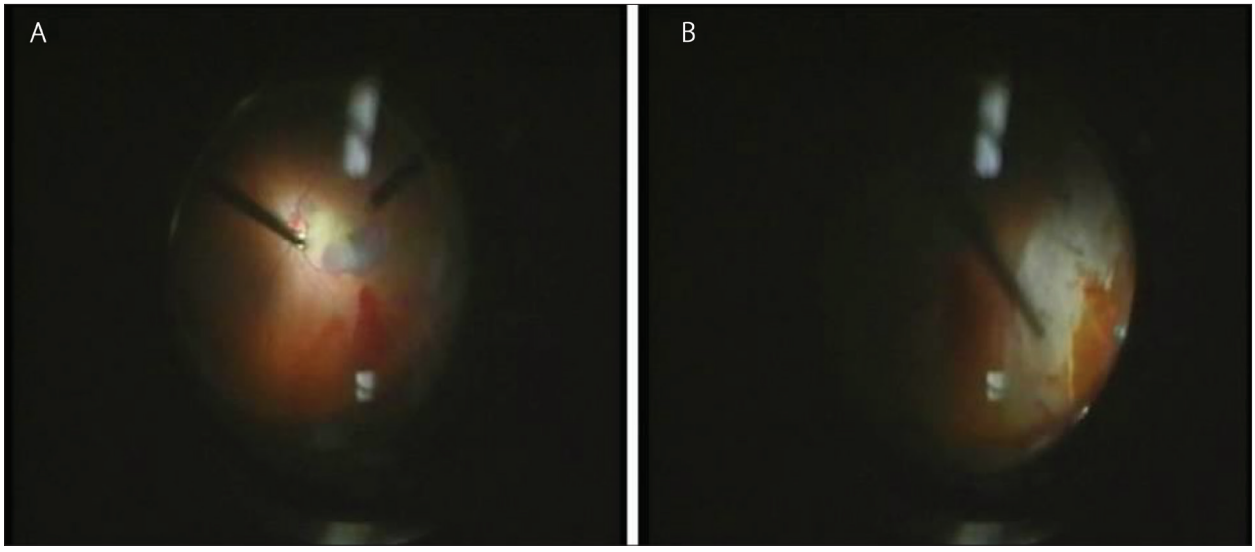


**Figure 4.** Several pre-retinal hemorrhages and subretinal hemorrhage in the macular region (A); a large retinal dialysis in the temporal quadrant (B)

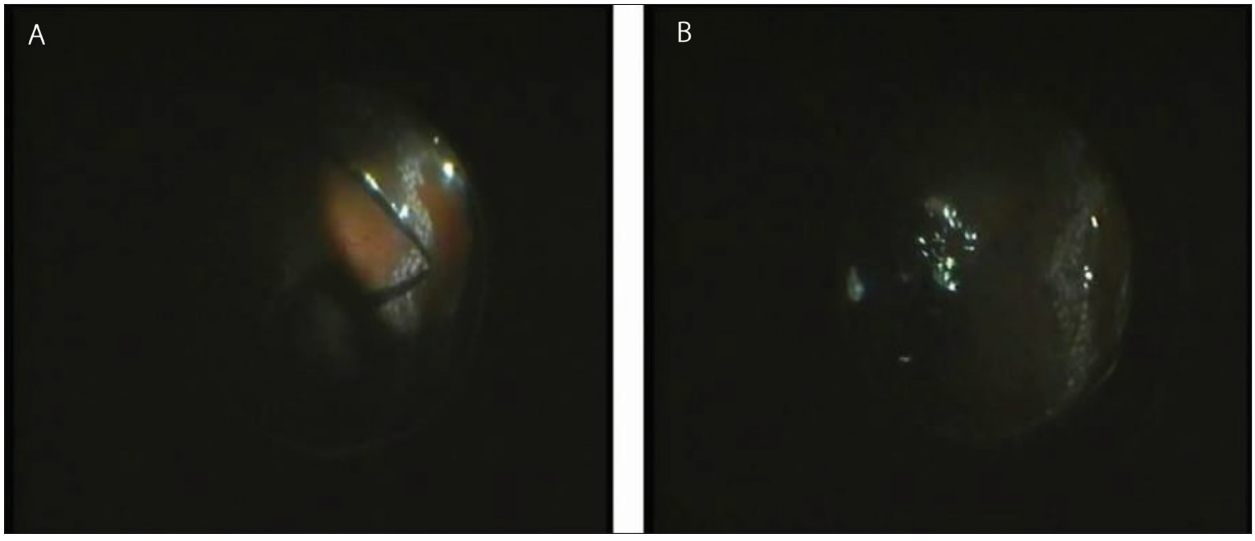


**Figure 5.** Perfluorocarbon–air exchange and laser spots in several rows along the posterior border of the dialysis (A); surgical treatment was finished with air–silicone oil exchange (B)

the posterior border of dialysis and at the vitreous base. The posterior border of the dialysis was relaxed from vitreal traction and the retina became mobile. The vitreous base was cleared along the complete circumferention. Perfluorocarbon (decalin) was installed and the retina was stabilized and attached in the zone of damage. Laser photocoagulation was applied in several rows along complete circumferention of the peripheral retina and in the zone of the posterior border of dialysis. Perfluorocarbon–air exchange was done and surgical treatment was finished with air–silicone oil exchange (Figure 5). During hospitalization, the patient received antibiotics, corticosteroids, and a mydriatic drug locally, as well as systemic antibiotics and corticosteroids. In the early postoperative period, the mild increase of intraocular pressure of 26 mmHg was noticed and treated locally with antiglaucomatous therapy. He was discharged from the hospital and at the control visit one week later, the patient's left eye BCVA was 2/60, with intraocular pressure of 15 mmHg. At eight months after surgery, the patient's BCVA was 3/60. At the same control visit, fundus photography showed spontaneous resorption of the subretinal hemorrhage in the macular region, attached retina under the silicone oil with scar tissue at the posterior border of the dialysis (Figure 6). Macular optical coherence tomography findings showed thinning, photoreceptors and retinal pigment epithelium destruction, and epiretinal membrane (Figure 7).

All procedures performed were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments. Written consent to publish all shown material was obtained from the patient.

## DISCUSSION

The majority of reported cases of fishing-related ocular injuries have been caused by fishhooks. These reports

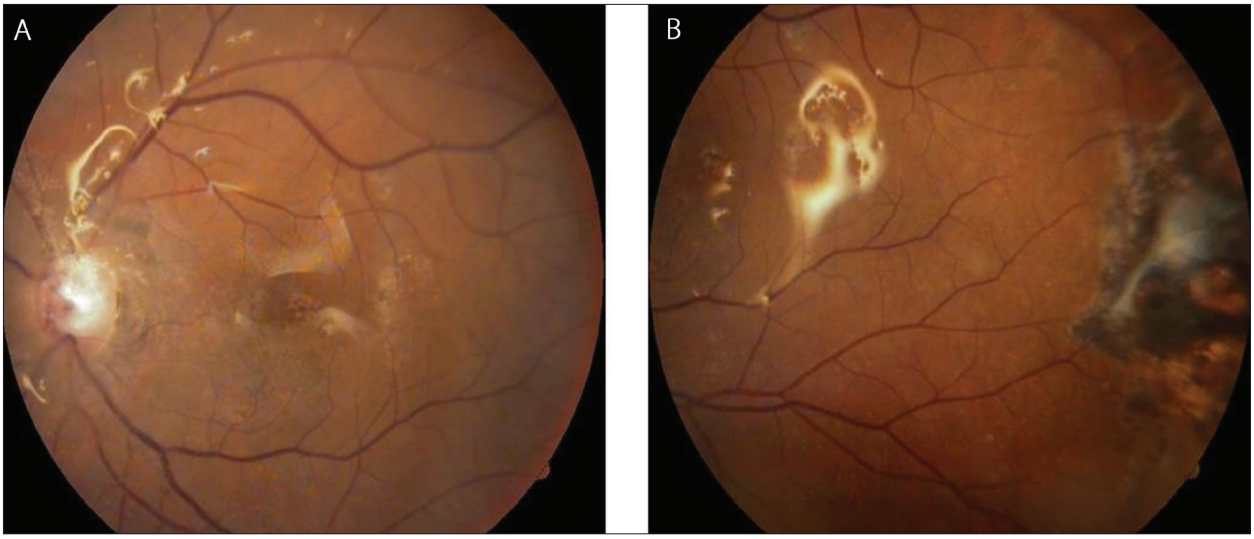


**Figure 6.** Fundus photography shows the spontaneous resorption of the subretinal hemorrhage in the macular region (A) with attached retina under the silicone oil and the scar tissue at the posterior border of the dialysis (B)

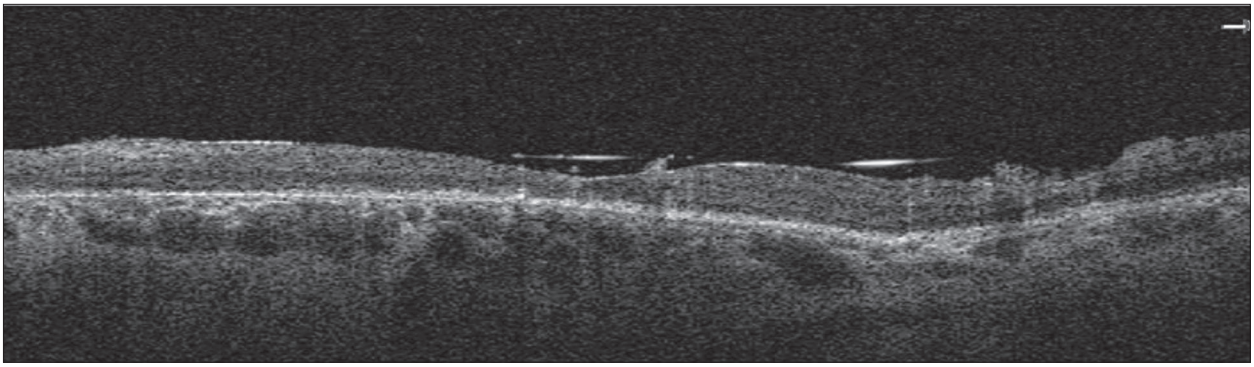

**Figure 7.** Optical coherence tomography of the macula shows thinning, photoreceptors and retinal pigment epithelium destruction, and epiretinal membrane

describe the types and severity of injuries, and the surgical techniques applied for fishhook removal [4, 5]. To our knowledge, this is the first case report of a patient with a severe blunt ocular injury caused by a fishing sinker during recreational fishing. The eye injury was caused by a metal fishing sinker 1 cm in length, which penetrated bulbar conjunctiva leaving a laceration of 0.2–0.3 mm in size. The fishing sinker was revealed during the primary surgical exploration of the eye globe and it was embedded under the lateral rectus muscle and removed. During vitrectomy, a large retinal dialysis was observed in the temporal quadrant in the projection of the contusion scleral wall injury caused by the fishing sinker. The large retinal dialysis, subretinal hemorrhage in the macular region, and hemophthalmos determined the severity of the eye injury in this patient.

In a retrospective analysis using United States Eye Injury Registry, Alfaro et al. [6] reported that 19.54% of sport-related ocular traumas occurred during fishing. Corneal laceration, globe rupture, and hyphema are the most frequent eye injuries caused by fishhooks, fishing lures, or sinkers. In a study by Hoskin et al. [7], fishing-related eye injuries were found in 7% of sport-related injuries in a Western Australian pediatric population. Purtskhvanidze et al. [2] reported nine patients who experienced eye injury caused by a fishhook. Five patients had only eyelid injuries (55%) and four patients suffered open globe injuries (45%). Among those, one patient had eye trauma limited to cornea (25%), one patient had scleral injury (25%), and two patients had injuries of the lens, the iris, and the posterior segment (50%). Surgical treatment described in this report included primary pars plana vitrectomy performed for endophthalmitis and for retinal detachment with the giant retinal tear and choroid hemorrhage. Choovuthayakorn et al. [4] described primary wound management, the "back-out" technique of removing a fishhook from the upper eyelid embedded during fishing. The fishhook penetrated the cornea and the iris and was lodged in the ciliary body behind the clouded natural lens. The patient underwent lensectomy with pars plana vitrectomy and silicone oil tamponade for the treatment of the local retinal detachment. Uncommon mechanism of eye injury and the surgical treatment was reported by Iannetti and Tortorella [5] in patients who suffered fishhook injury that penetrated through the sclera 2 mm from the corneal limbus and the trabeculum and was lodged in the anterior chamber. Nakatsuka et al. [8] described the "cut-out" technique for the removal of a large fishhook that caused full-thickness

corneal penetration at the nasal limbus and was lodged in the anterior chamber angle of the eye.

We describe a severe blunt eye trauma associated with hemophthalmos, subretinal hemorrhage in the macular region, and a large retinal dialysis in the temporal quadrant. Retinal tears in the region of the ora serrata and peripheral retina are typically caused by blunt trauma [9]. A retinal dialysis is a tear in the retina whose anterior edge is at ora serrata and whose posterior edge is attached to the vitreous base [10]. Retinal dialysis has been described as the most common complication after ocular contusion injury [11]. The incidence of rhegmatogenous retinal detachment caused by a dialysis is 8–17% and the retinal dialyses are most often seen in younger men following trauma [12]. In contrast to eye trauma-related giant retinal tears, which are caused by vitreal traction, in a retinal dialysis vitreous base is firmly attached to the posterior border, but an avulsion of the vitreous base may occur and it represents the pathognomonic sign of a blunt eye injury [11]. A blunt injury causes a retinal dialysis by the compression of the eye in the anteroposterior plane, which results in the expanding in the equatorial plane and causes pressure in the vitreous base [11]. Retinal dialyses are most often located in the inferotemporal quadrant. However, multiple dialyses, small dialyses, and dialyses in several quadrants may exist [13].

In conclusion, to our knowledge, this is the first case report of a severe blunt ocular injury associated with a large retinal dialysis caused by a fishing sinker. Accidents due to fishing equipment are rare and may result in serious ocular injuries and significant visual loss. The outcome of a fishing-related ocular injury depends on affected eye structures, the mechanism of injury, the presence of complications, and surgical techniques applied. We report treatments that were applied in a patient with a severe ocular trauma caused by a fishing sinker that involved the posterior segment, including subretinal macular hemorrhage and retinal dialysis, which enabled satisfactory visual and anatomical outcomes. However, to reduce the occurrence of fishing-related eye injuries, preventive measures should be undertaken, such as the use of protective eyewear during this activity.

**Conflict of interest:** None declared.

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# Неуобичајено тешка контузиона повреда ока удружена са великом дијализом ретине настала металним тегом за пецање

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**САЖЕТАК**

**Увод** Тешке повреде ока настале опремом за пецање су релативно ретке. Функционална прогноза по вид код повреда насталих опремом за пецање зависи од захваћених окуларних структура, присуства компликација и хируршких техника које се примењују код различитих типова повреда.

**Приказ болесника** Мушкарац, узраста 40 година, током рекреативног пецања је, повлачећи штап, одједном осетио веома оштар бол и губитак вида на левом оку. Најбоље коригована видна оштрина на левом, повређеном оку, на пријему је износила 1/60. Клиничким прегледом уочена је лацерација булбарне конјунктиве величине 0,2–0,3 *mm*, као и тамна тумефакција испод конјунктиве у истом, темпоралном сегменту. Тамна тумефакција испод конјунктиве је током примарне хируршке експлорације идентификована као метални тег за пецање величине 1 *cm*, који се налазио испод спољашњег правог мишића. Булбарни зид је био интактан, а метални тег пажљиво уклоњен. Затим је урађена факоемулзификација природног сочива са уградњом савитљивог, вештачког, интраокуларног сочива као и 23Г *pars plana* витректомија. Током витректомије откривено је присуство субретиналне хеморагије у макули, као и велика дијализа ретине у темпоралном квадранту. Витректомија је завршена тампонадом силиконским уљем. На првој постоперативној контроли, недељу дана касније, најбоље коригована видна оштрина на левом оку је износила 2/60. Осам месеци после операције контролни налаз је показао спонтану ресорпцију субретиналне хеморагије у макули са налегнутом ретином. Најбоље коригована видна оштрина је износила 3/60 као последица деструкције фоторецептора и ретиналног пигментног епитела у макули и формирања епиретиналне мембране.

**Закључак** Према нашим сазнањима, ово је први приказ тешке контузионе повреде ока удружене са великом дијализом ретине настале металним тегом за пецање.

**Кључне речи:** траума ока; метални тег за пецање; субретинална хеморагија; дијализа ретине; витректомија