Unusual eye injuries

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Purpose: The analysis of ten unusual eye injuries, and the discussion of appropriate preventive measures.

Case outline: Ten patients hospitalized at the Clinic of Eye Diseases, Clinical Center of Serbia, Belgrade, in the period from January 2000 to December 2009, were presented. Following data were taken into account: sex and age of the patient, injured eye, the mechanism of injury, type of the injury, applied treatment and final visual acuity. The circumstances of the eye injuring of ten patients were described. The eye injuries in all cases occurred in a bizarre way and they were severe enough to require hospital admission. The surgery was necessary in seven patients. Three injured eyes resulted in blindness, and two additional had subnormal vision.

Conclusion: In three quarters of discussed cases injuries can be avoided. It is necessary to implement protective measures constantly and consistently and to think about the possible consequences of certain activities. Particular attention should be paid on safety of children. The iatrogenic injuries require special consideration.

Key words: unusual eye injury, severity of the injury, preventive measures

INTRODUCTION

The eye injuries present a public health problem because of their frequency and possibility of serious consequences. The eye injuries occur predominantly at the specific places, such as workplace, home or sports field, and are caused by specific causes1,2,3,4. The information about places, sources and circumstances of injuries are important not only for adequate treatment of the injured eye, but above all, for designing and implementing preventive measures. However, other than these usual mechanisms of injury, there are some uncommon causes, occurring extremely rarely, in single cases5,6,7,8. Nevertheless, one should be aware of these possibilities because of appropriate protection and mode of treatment.

Authors present and analyze ten unusual eye injuries, and discuss the importance of appropriate preventive measures.

CASES REPORTS

All presented patients were treated at the Clinic of Eye Diseases, Clinical Center of Serbia, Belgrade, between January 2000 and December 2009. In that 10-year period all together 3206 patients were admitted to the Clinic for serious eye injuries. Each of 10 presented cases was injured in a different way. As only a single patient was injured in the specific way within 10-year period, we considered them worthwhile to be presented in this paper.

Table 1 illustrates 10 patients who had experienced unusual eye injuries. Data includes sex and age of the patient, the injured eye, the mechanism of injury, type of the injury according to the admission diagnosis, applied treatment, definite visual acuity and finally, one short comment on each patient.

The first injured person was a 2-year-old boy who was wounded by cock’s beak in the yard of a farm house. It was severe injury, penetration of cornea and sclera with prolapse of the iris and vitreous body and with traumatic cataract. The infant was admitted and operated on immediately. The patient has been checked up regularly for several years. The eyeball atrophy with amaurosis has ensued. There was no sign of sympathetic ophthalmia. The boy’s parents and he himself have denied enucleation and therefore, he wears esthetic prosthesis over atrophic eyeball. The prosthesis fits well, it is mobile in all directions and it is well tolerated by patient. Severe cock’s beak injuries have been reported by other authors as well6.
The second patient was a 70-year old man who experienced bee sting in the central cornea. On admission, limited central discoid edema of the cornea without any visible foreign body and with inflammatory reaction in the anterior eye chamber was diagnosed. Visual acuity was 0.2. A patient was treated by antibiotic eye drops during one week and corticosteroids over a month. Corneal edema subsided with residual discreet opacification what did not interfere with normal visual acuity of 1.0. The presence of foreign body was not visualized by regular light microscopy, while confocal microscopy was not carried out, as reported by some other authors. The third patient, 65-year old male, was injured by a sparrow. He opened the door of an outbuilding in his backyard and the sparrow, being inside, was frightened and flew out so rapidly that it flew against man’s right eye. It resulted in contusion globe injury with rupture of the iris sphincter, traumatic mydriasis, lens subluxation and increased intraocular pressure. Visual acuity was 0.1. The surgery included removal of the subluxated lens and implantation of an artificial intraocular lens in the same procedure. Postoperative visual acuity was restored to normal of 1.0, and intraocular pressure was also back to normal without additional therapy.

A 14-year old girl was injured by hedgehog. On her way to school, she and her school friend, a boy, came across the hedgehog, the boy kicked the hedgehog and it hit her left eye. On examination, biomicroscopy identified several punctures of the cornea with surrounding infiltration and inflammatory reaction in anterior eye chamber. The depth of the anterior eye chamber was normal. Visual acuity was normal. The patient was treated by local antibiotic and corticosteroid therapy. The result was complete cure in three weeks.

### TABLE 1

<table>
<thead>
<tr>
<th>Pat</th>
<th>Sex</th>
<th>Age</th>
<th>Eye</th>
<th>Mechanism of injury</th>
<th>Admission diagnosis</th>
<th>Op</th>
<th>VA</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>2</td>
<td>OS</td>
<td>Cock’s beak</td>
<td>Penetrating corneal and scleral wound with iris and vitreous body prolaps. Traumatic cataract</td>
<td>+</td>
<td>NLP</td>
<td>Bulbar atrophy</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>70</td>
<td>OS</td>
<td>Bee sting to cornea</td>
<td>Penetrating corneal wound. Corneal edema</td>
<td>-</td>
<td>1.0</td>
<td>No sequelae</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>65</td>
<td>OD</td>
<td>Hit by sparrow in flight</td>
<td>Bulbar contusion. Traumatic mydriasis. Lens subluxation</td>
<td>+</td>
<td>1.0</td>
<td>Implanted IOL</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>14</td>
<td>OS</td>
<td>Hedgehog</td>
<td>Penetrating bulbar wound</td>
<td>-</td>
<td>1.0</td>
<td>No sequelae</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>30</td>
<td>OD</td>
<td>Agricultural aircraft-tree branch</td>
<td>Penetrating bulbar wound through the sclera</td>
<td>+</td>
<td>1.0</td>
<td>No sequelae</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>61</td>
<td>OD</td>
<td>Iatrogenic injury by RB anesthesia needle</td>
<td>Penetrating bulbar wound through the sclera</td>
<td>+</td>
<td>NLP</td>
<td>Amaurosis of another eye due to earlier injury</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>25</td>
<td>OS</td>
<td>Syringe needle while washing out the eye</td>
<td>Penetrating bulbar wound through the sclera</td>
<td>-</td>
<td>1.0</td>
<td>Injured by his mother, a doctor</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>43</td>
<td>OS</td>
<td>Wall meat hook</td>
<td>Laceration of the bulbar conjunctiva. Resection of the m. recti laterales.</td>
<td>+</td>
<td>1.0</td>
<td>Sequelae:paralitic convergent strabismus</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>20</td>
<td>OD</td>
<td>Explosion of the cell phone charger</td>
<td>Penetrating bulbar wound. Intrabulbar foreign body.</td>
<td>+</td>
<td>0.6</td>
<td>Sequelae:subnormal vision of the eye</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>16</td>
<td>OU</td>
<td>Gun shot-bullet</td>
<td>OD: Bulbar contusion OS: Bulbar rupture</td>
<td>+</td>
<td>0.7 NLP</td>
<td>Enucleated left eye</td>
</tr>
</tbody>
</table>

Pat = patient; Op = operation; VA = visual acuity; M = male; F= female; OD= right eye; OS = left eye; RB=retrobulbar; OU = both eyes; NLP = no light perception (amaurosis)
A 30-year old man was injured by tree branch while he was flying the agricultural aircraft for crop dusting very low. He sustained the penetrating wound of the right eyeball through the sclera. On admission, visual acuity was light perception with correct projection due to massive vitreous hemorrhage. The wound was primarily managed and normal visual acuity of 1.0 was regained after a spontaneous resolution of vitreous hemorrhage.

In the local country-side institution cataract surgery of the right eye of an 61-year old patient was initiated. At the beginning of the operation, while applying the retrobulbar anesthesia, the eyeball was penetrated by syringe needle and the anesthetic was injected directly into the eyeball. An abrupt rise of intraocular pressure, corneal edema and severe pain developed. The patient was immediately transported to the Clinic. Amaurosis of another, left eye, as the result of earlier injury was diagnosed, too. Unfortunately, the loss of vision of the right eye followed not only because of mechanical injury of the eyeball by needle, but as a result of the toxic effects of a large volume of anesthetics too.

A 25-year old student was admitted with puncture injury of the left eye caused by syringe needle. The injury was inflicted by his mother, who rinsed his eye with saline. Under pressure, the needle popped out and penetrated the sclera, causing the partial hemophthalmus. The treatment was conservative. On discharge visual acuity was 1.0.

A 43-year old man was injured by metal wall hook, while he was trying to hang the meat. He experienced the laceration of the upper eyelid and rupture of the external rectus muscle of the left eye (Picture 1). Visual acuity was 1.0. The surgery included the eyelid reconstruction and reinsertion of the remnants of the lateral rectus muscle. A paralytic convergent strabismus of the left, injured, eye remained.

A 20-year old man was injured in explosion of the cell phone charger (Picture 2). It was a penetrating injury of the right eyeball with two entry wounds through cornea and sclera and with intraocular foreign bodies. Vitrectomy was performed and foreign bodies were extracted. Final visual acuity was 0.6.

A 16-year old girl was shot by her boyfriend with a gun into the left temporal region (Picture 3). On admission, the rupture with traumatic semi-evisceration of the left eyeball and severe contusion injury of the right eyeball was evident. Upon neurosurgical intervention, she was additionally operated at the Clinic of Eye Diseases. Definite visual acuity of the right eye was 0.7. After surgical extirpation of the bulbar remnants she received an esthetic prosthesis for the left eye.

DISCUSSION

As seen from the above-reported, the eye injuries in all 10 presented cases occurred in a bizarre way, and they were severe enough to require hospital admission. The surgery was necessary in seven patients.

The analysis of 8 952 patients with severe eye injuries in USA shows the male to female ratio of 4.6:1. Between our patients there were two females and eight males. The
males are much more susceptible to injuries even in unusual situations.

Six of our patients were 30-year old or younger. May and coworkers found that 58% of persons with serious eye injuries were less than 30 years of age.

Three injured eyes resulted in blindness, and two additional had subnormal vision. Kuhn and coworkers reported that no less than 27% of eyes with serious injury had worse than 20/200 final vision.

All ten patients reported that the injury occurred by chance. If the injury was actually caused by accident it means that there was no possibility to prevent its occurrence. However, it should be seriously discussed in which of presented cases the injury could be avoided.

Bee sting (case 2) and a sparrow in flight stroke (case 3) were unpredictable events, they could hardly be avoided, and indeed can be considered accidental.

Injury by hedgehog (case 4) is in fact a consequence of carelessness and it is an accidental mistake.

Attack of a two-year boy by a rooster (case 1) is the result of irresponsibility of his parents who have not protected a child from the different dangers that exist in the farm yard.

It is unacceptable that an irresponsible person, especially adolescent, have access to firearms (case 10). This must be legally regulated, and the rules must be strictly respected.

Special attention should be paid on appropriate handing of a device and on a fact that the device functions properly (case 9).

Eye injuries during the flying of agricultural aircraft (case 5) and meat processing (case 8) were a direct consequence of disregard of appropriate protective measures.

It is difficult to discuss an eye injury with a syringe needle (case 7) especially if it is known that the mother, a physician, carried rinse. In any case, injury can not be considered accidental.

An iatrogenic injury (case 6) with severe consequences deserves special attention. An ophthalmologist without enough knowledge and experience should not operate a patient with only one functional eye, especially under inadequate conditions.

All together, in three quarters of discussed cases injuries can not be regarded as accidental, so they can be avoided. It is necessary to implement protective measures constantly and consistently and to think about the possible consequences of certain activities. Particular attention should be paid on safety of children. The iatrogenic injuries requires special consideration.

The recognition of different mechanisms of injury of the eye is important in attempt to identify a risk factors and create adequate protective measures.

SUMMARY

NEOBIĆNE POVREDE OKA

Svrha: Prikaz i analiza deset povreda oka nastalih na neobičajen način, kao i predlog preventivnih mera.


Ključne reči: neobične povrede oka, težina povrede, preventivne mera

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