CEOTI
Clinical and Experimental
Ocular Trauma and Infection

ORIGINAL ARTICLE

Received Date: 29 December 2019 Accepted Date: 30 December 2019 Publication Date: 31 December 2019

Unusual Foreign Bodies in Eyelids in Childhood

Sertaç Argun Kıvanç[1], MD, Berna Akova[1], MD, Mahmut Oğuz Ulusoy[2], MD, Mehmet Atakan[3], MD

1Bursa Uludag University, School of Medicine, Department of Ophthalmology, Bursa, Turkey
2 Baskent University, Konya Hospital, Department of Ophthalmology, Konya, Turkey
3 Sancaktepe Training and Research Hospital, Department of Ophthalmology, Istanbul, Turkey

Abstract

Purpose: To evaluate the importance of the foreign bodies in the eyelid of pediatric patients.
Method: The charts of pediatric patients who referred to Department of Ophthalmology with eyelid trauma were retrospectively reviewed. Children with foreign bodies were included in the study.
Results: Seven of the 82 pediatric patients had foreign bodies in their eyelids. Mean age of the children was 5,6±2.4 years. In all cases globe was intact but one who was injured with bullet. Five of 7 patients were injured outdoor. In 2 patients foreign bodies were organic. Only one patient, who had injury with bullet, had low vision; visual acuity was 20/20 in rest of the patients.
Conclusion: Detailed ophthalmic examination is crucial in trauma patients. Examination under general anesthesia and surgical intervention should be kept in mind especially in children with unusual injuries.

Introduction

Eyelid trauma is one of the most encountered ocular traumas in childhood. Because of the lids anatomical position, they were likely to be damaged more than other ocular structures. During childhood, the reasons of ocular trauma differ from adults. Nail scratches ,chemical traumas, foreign body injuries are among them. In a study, eyelid injuries was found 22 % among all reasons in children. (1) Children with apparent foreign bodies present as an ocular emergency to the ophthalmic clinics while some foreign bodies may be hidden and only can be seen as chronic relapsing ocular inflammation which is resistant to medical therapy. (2-7) Most injuries occurred at home and at school, which shows the presence in these places of potential hazards, often unrealized or neglected. (1)
In this study we present 7 unusual foreign bodies in the eyelids of children.

Methods

The charts of pediatric patients who were referred to Bursa Uludag University Department of Ophthalmology as emergency cases between July 2017 and December 2019 were reviewed retrospectively. From 82 pediatric patients 7 were identified as unusual cases with foreign body in the eyelid. Those 7 cases were included in this study. Seven cases were underwent total ophthalmic examination and imaging was carried out. Only one family did not accept imaging or surgical intervention.

Results

Twenty three percent of ocular emergencies that underwent surgical intervention or repair were children. Seven of the 82

Corresponding author: Dr Sertac Argun Kivanc, Bursa Uludag University, Department of Ophthalmology
Tel: +905059235004 e-mail:sakivanc@gmail.com

This study was presented as free paper at ISOT 2018 meeting.

Figure 1: Case1. He had a swollen eyelid, purulent discharge and hyperemia on his left eye.

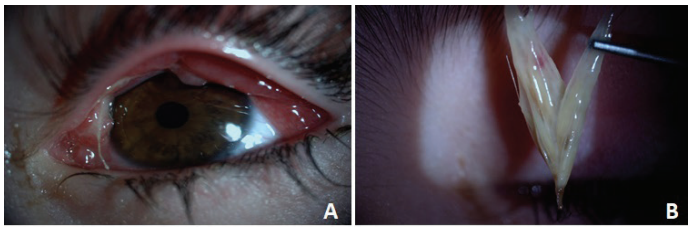

Figure 2: Case 1. Oat seeds are in the superior conjunctival fornix. A)Purulent discharge B) Oat seed

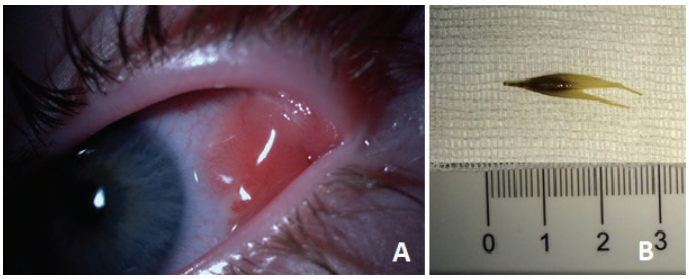

Figure 3: Case 2. A)Pyogenic granuloma B)Oat seed

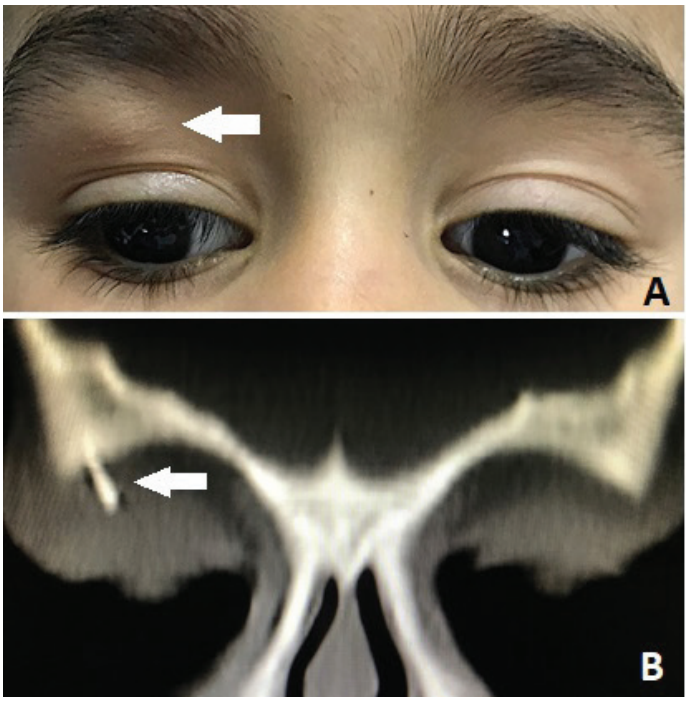

Figure 4: Case 3. A) A mass on his right upper eyelid B) Computed tomography image of case 3

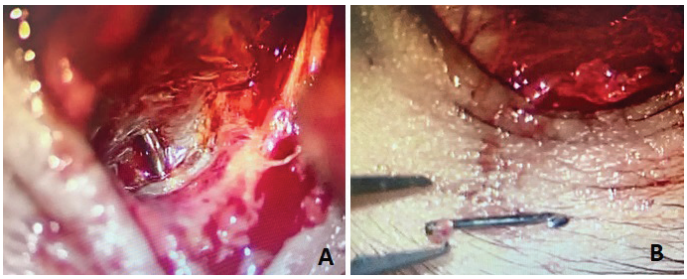

Figure 5: Case 3. A and B)Intraoperative images of the crochet needle head.

Figure 6: Case 4. Rounded mass on lower eyelid.

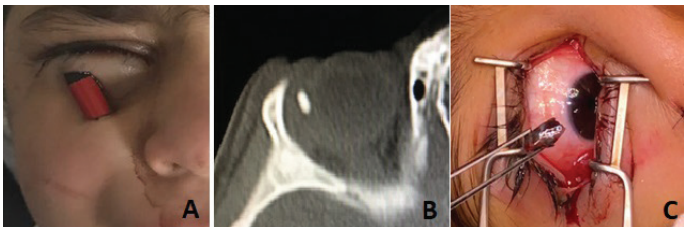

Figure 7: Case 5. A)Pencil in the lower eyelid B)Computed tomography image of the

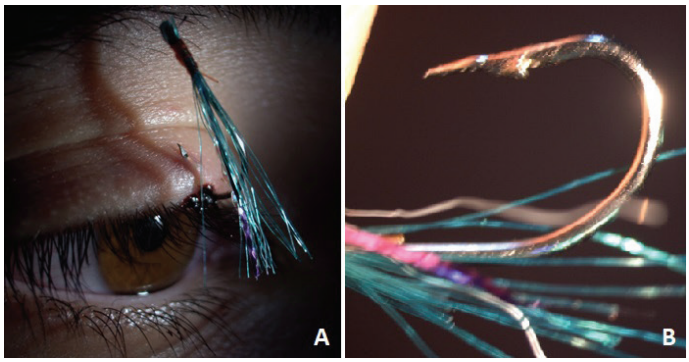

Figure 8: Case 6. A) Fish hook in upper eyelid B) Barbed structure of the fish hook.

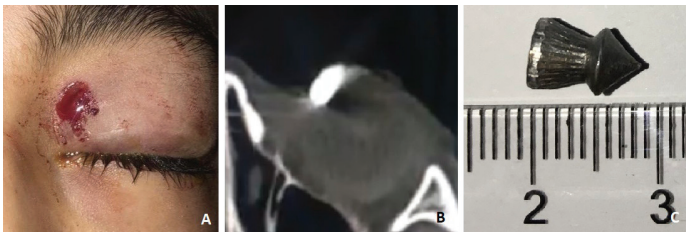

Figure 9: Case 7. A) Wound in the upper eyelid B) Computed Tomography image of the foreign body in the upper eyelid C) Air-gun pellet

pediatric patients had foreign bodies in their eyelids. Mean age of the children was 5,6±2.4 years. In all cases globe was intact but one who was injured with bullet. Five of 7 patients were injured outdoor. In 2 patients foreign bodies were organic. Only one patient, who had injury with bullet, had low vision; visual acuity was 20/20 in rest of the patients. Information about patients were given in Table 1. Five of the 7 patients were preschool-aged, 2 were school-aged children. The ages of the patients were 7 or under 7 in 6 patients.

Our first case was a 5 year-old male and he was complaining about redness, pain and discharge in his left eye (Figure 1). He had these symptoms for 2 months. His mother told that he felt down on a plantation area and after that day his complaints had started. They had visited different ophthalmology departments and topical antibiotics had been prescribed but no cure was obtained. In ophthalmic examination there were a periorbital redness and swelling and also mucopurulent discharge, membranes, ciliary injection in his left eye (Figure 1). Under biomicroscopic examination we found multiple organic foreign bodies, that were determined as oat seeds (Figure 2A and 2B). The seeds were removed and after 2 weeks all complaints and findings were resolved.

In second case, a 4 year-old female had a red growing mass on her left eye for 6 months and she had no other significant history (Figure 3A). She was referred to our department as pyogenic granuloma for surgery. She had a hyperemic mass on her temporal conjunctiva. After a carefully examination of her eyelid -double elevation- under biomicroscopy , an organic foreign body -oat seed- were found at the upper fornix and removed (Figure 3B). The patient was checked 1 week after removal and all symptoms were resolved.

Third case was three year-old male that was referred to our department with a mass on the right upper eyelid. His parents noticed a growing mass 1 week ago, he had no other significant history (Figure 4A). In computed tomography (CT) imaging it was noted that there was approximately a 1 cm wide hiperdense object in his right upper lid (Figure 4B), however; no obvious entrance wound was found in his ophthalmologic examination. After his CT scan, his mother declared that she had found a broken crochet needle at the home. In the operation room 0.8 mm broken crochet needle was found in upper lid through anterior orbit that was surrounded with an abscess (Figure 5A and 5B). Foreign body was removed, patient recovered with no sequelae.

In another case (case 4) a 6 year-old girl was complaining about a blueish mass on her right lower eyelid (Figure 6). She declared that she had felt down and got a trauma to her lower eyelid 6 months ago. Ecchymosis and edema had occurred at that time. She also expressed that sometimes the mass had bleeded. During ophthalmic examination a hard round shape mass was felt with palpation. Tomography imaging was planned for further investigation however the family did not accept imaging or detailed investigation. According to her examination and history, we presumed the mass was post traumatic capillary hemangioma. Because lack of consent we could not investigate and treat this patient.

Another 4 year-old female (case 5) was brought to emergency department with a pencil injury. In her history, she had felt down while a pencil was in his mount. Pencil tip was exposed under her right eyelid and the rest was felt under skin obliquely in her cheek with palpation.(Figure 7A) Computed tomography imaging showed a hyperdense object was in her right cheek under lower lid (Figure 7B) .However no globe injury was noticed. There was only conjunctival laceration. The pencil was removed surgically and lower lid retractor was repaired.(Figure 7C).

Our sixth case was a 7 year-old male. He was referred to Department of Ophthalmology with a fish hook in his right upper eyelid.(Figure 8A). The hook perforated his upper lid but fortunately the glob was intact. The hook then removed surgically. (Figure 8B). No post-operative complication was observed.

Our last case- 10 year-old child- was (case 7) referred to emergency department with loss of vision in his left eye, after he had been shot by his friend with air-gun. In his ophthalmic examination, there was a wound on his upper eyelid and a hard mass was felt with palpation (Figure 9A). His vision was hand motion, and on biomicroscopic examination subconjunctival bleeding and hypotonia was noticed. Retinal detachment and vitreous hemorrhage were also diagnosed in fundus examination. His computed tomography imaging revealed foreign body in the upper eyelid. (Figure 9B) In operation room a 9 mm air-gun pellet was removed from superior fornix (Figure 9C). Rupture of globe was also found under bleeding conjunc-

Table 1.General Features Of Eyelid Traumas

Case	Age	Gender	Symptom	Findings	Imaging	Diagnose	Treatment
1	5	M	Conjunctival redness, Pain, Discharge	Mucopurulent Discharge ,Periorbital Redness, Swelling	None- organic foreign body	Multiple Oat Seed in Fornix	Mechanic removal
2	4	F	Conjunctival red mass	Conjunctival hyperemia	None- organic foreign body	Oat seed in Fornix	Mechanic removal
3	3	M	Growing painless mass upper eyelid for a week	Non mobile mass on upper lid	Metallic foreign body	Crochet needle	Surgical Removal
4	6	F	Round mass on lower lid for 6 months after trauma	Round shape mass on lower eyelid	N/A*	Post traumatic foreign body or capillary hemangioma	N/A*
5	4	F	Pencil injury in lower lid	Pencil was beneath under skin	Foreign body	Pencil injury	Surgical removal
6	7	M	Fish hook injury at upper lid	Fish hook found at upper lid	none	Fish hook injury	Surgical removal
7	10	M	Low vision and pain	Wound in upper eyelid, hypotonia, retinal detachment	Foreign body in the eyelid	Bullet	Surgical removal and globe repair

*Parents did not accept imaging or surgery.

tiva and repaired. Retinal detachment and vitreous hemorrhage was deferred to secondary operation.

Discussion

Ocular traumas are important and need to be treated quickly in childhood. Not only globe injuries but eyelids must be evaluated carefully. Many injuries with foreign bodies are underestimated. Because many foreign bodies may be hidden and cause recurrent inflammation that mimicking infections.(2-7) Trimmers et al reported that pediatric patients with foreign body injuries mostly referred with respiratory or gastrointestinal tracts foreign bodies. Ocular foreign bodies were found rare. (8) Although the rate of ocular foreign body was found low, it can lead devastating ocular morbidities. Because of this history taking and full ocular examinations are the crucial step in ophthalmic evaluation. In our 2 cases oat seeds were the causes of the injuries. Both injuries were happened after felt down on agriculture fields. Both patients were misdiagnosed previously. This kind of injuries are very rare and hard to recognize so history taking is of utmost importance. Similar symptoms can be seen in pediatric patients with foreign body in fornices without any trauma history.(2,4,7,9) Synthetic fibers from teddy bears, pillows, blankets, and cotton fibers, button batteries, toys, insect hairs (caterpillar) or leech and parasites may enter fornices accidently and may cause hyperemia, discharge, granuloma, swollen eyelid.(2-12) However in such cases there is lack of trauma or fall down history. Taylor et al. reported three children who applied to emergency with a painful and watering eye. Severe localized edema of the conjunctiva and inflammation was evident with conjunctival ves-

Table 2: Similar case presentations in the literature

Authors	Year	Patient			Material	Source	Injury site
		Count	Age	Sex			
Betharia et al. (19)	1985	1	3	male	organic	Bean seed	Eyelid, conjunctiva
Taylor et al. (3)	2001	3	6,10,14	All male	organic	Oat seed	Conjunctiva
Sakata et al (20)	2007	1	3	male	plastic	Toy	Eyelid, conjunctiva
Sen et al. (18)	2011	1	5	female	organic	Grass	Conjunctiva
Ogasawara et al. (4)	2011	1	3	female	metal	Button battery	Eyelid, conjunctiva
Ratnarajan et al. (17)	2013	1	2	female	metal	Button battery	Eyelid, conjunctiva
Khan et al.(5)	2014	1	2	female	metal	Button battery	Eyelid, conjunctiva
Subramaniam et al. (16)	2015	1	11	male	metal	Fish hook	Eyelid
Elghazi et al.(9)	2016	1	7	N/A	organic	Cactus thorn	Conjunctiva, globe
Jinagal et al.(13)	2018	1	3	female	organic	Vegetative material	Conjunctiva, cornea
El Kaddoumi et al. (14)	2019	1	10	female	metal	Jewelry	Eyelid, conjunctiva
Purtskhvanidze et al.(15)	2019	3	N/A	N/A	metal	Fish hook	Eyelid

N/A: Not applicable

sel injection leading to bleeding, like chemical burn. Two of them appeared to have eyelash behind the lid, so emergency doctors tried to remove them but they could not. Eventually it was understood that seedpods had become embedded in the subconjunctival space.(3) Similar cases with other kinds of seeds, cactus torn, vegetative organisms, grass were previously published.(3,9,13,18) (Table 1)

When evaluating preschool children with ocular trauma, many reasons should be kept in mind. We presented a case with broken crochet needle injury. There were many case reports about intracranial, cardiac or hand perforation with crochet needle but eyelid perforation has not been reported previously (21)
Pencil trauma of the eyelid mostly seen in pediatric age groups In reported cases especially the tip of the pencil retained in the eyelid or orbita. (22,23) Pencil is made of a mixture of carbon, clay and animal fat and is surrounded by a wooden sheath. The main component, carbon, is known to usually remain inert in the eye. However sometimes it may mimick ocular melanoma or potential toxicity due to the other components especially when cornea is involved.(24,25) Stromal keratitis and even endophtalmitis were reported with pencil traumas.(26) Therefore pencil trauma must be considered and evaluated in a great detail. In our case the patient was quite lucky that neither cornea nor intra-ocular structures were injured with pencil. Eyelid structures should be repaired meticulously such as full thickness eyelid injuries.

In all general causes of traumatic eye injury, the ones with fishhooks can have devastating consequences especially if cornea is involved. (15, 27) Fortunately these are rare injuries, especially in childhood. Fishhooks are not easy to remove because of its barbed design so different removing techniques were described.(16) There are several cases with fisherman injuries in adults reported in literature (16,28), our case is one of the rare cases that was described in a child.

In pediatric eyelid injuries ocular examination is very important. Especially for foreign bodies in the fornix double elevation of the upper eyelid is crucial. Also, urgent surgical intervention and examination under general anesthesia should be kept in mind in pediatric cases. Previous traumas also should be asked to patients. Even it had been occurred long time ago, post traumatic changes in eye reveal itself as a recurrent inflammatory process or a silent hard mass. Pyogenic granulomas and post traumatic hemangiomas are rare entities which may show up various anatomic areas in body including hand, lips,nose. Similar cases on the hands were reported.(29) We diagnosed foreign body and hemangioma in one case however parents of the patient did not give consent neither for imaging nor forsurgical intervention.
Most of the eyelid traumas with air gun bullets may result with ocular injuries. Patients are generally young male teenagers. (30) Bowen et al reported 105 cases that injured with airgun pellet. Mean age was found as 14 years. (31) Visual acuities are generally low because most of the air gun injuries may cause open globe injuries additional to adnexial injuries. In this study our case was 10-year old child with eyelid injury, globe rupture and retinal detachment.

Conclusion

Ocular traumas and foreign bodies should be kept in mind in patients with unexplained findings especially in preschool-aged children. Trimmers et al reported that pediatric patients under age 7 should be supervised carefully against foreign body injuries.(8) The ages of six children of 7 cases in this study were also under 8 year-old. All detailed ocular and systemic history should be taken and total ophthalmic examination must be done under general anesthesia if needed. Good prognosis and outcomes can be achieved when appropriate medical and surgical treatment is performed.

References

1.Mayouego Kouam J, Epée E, Azria S, Enyama D, Omgbwa Eballe A, Ebana Mvogo C, et al. Epidemiological, clinical and therapeutic features of pediatric ocular injuries in an eye emergency unit in Île-de-France. J Fr Ophtalmol. 2015;38(8):743-51.

2. Ainbinder DJ, O'Neill KP, Yagci A, Karcioglu ZA. Conjunctival mass formation with unexpected foreign body. J Pediatr Ophthalmol Strabismus. 1991 May-Jun;28(3):176-7.

3. Taylor C, Macnab AJ. Pediatric eye injury due to Avena fatua (wild oats). Pediatr Emerg Care. 2001;17(5):358-60.

4. Ogasawara M, Goto S, Shiba T, Ohno K, Shibata T, Kouzaki K, et al. A case of button battery-induced corneal and conjunctive burn injury and experimental findings of local damage. Nippon Ganka Gakkai Zasshi. 2011;115(8):711-7.

5. Khan Y, Maqsood S, Marpuri S, Bhermi S, Geh V. Rapid onset of severe ocular injury after exposure to a button battery. J AAPOS. 2014;18(6):600-1.

6. Cernea P. Ocular lesions produced by caterpillars. Oftalmologia. 1994;38(1):52-7.

7. Arocker-Mettinger E, Haddad R, Grabner G. Conjunctival granuloma caused by synthetic fibers. Klin Monbl Augenheilkd. 1986;189(6):479-81.

8. Timmers M, Snoek KG, Gregori D, Felix JF, van Dijk M, van As SA. Foreign bodies in a pediatric emergency department in South Africa. Pediatr Emerg Care. 2012;28(12):1348-52.

9. Elghazi T, Eljai A, Elkaddoumi M, Lazrek O, Saoudi SH, Belkbir T, et al. Conjunctival granuloma following neglected thorn injury: about a case. Pan Afr Med J. 2016 ;25:8.

10. Sakata C, Hiraoka T, Oshika T. Unusually large plastic toy as a persisting conjunctival foreign body. Jpn J Ophthalmol. 2007;51(3):232-4.

11. Lee YC, Chiu CJ. Ocular leech infestation. Clin Ophthalmol. 2015;9:419-21.

12. Ferry AP. Synthetic fiber granuloma. 'Teddy bear' granuloma of the conjunctiva. Arch Ophthalmol. 1994 ;112(10):1339-41.

13. Jinagal J, Gupta PC, Jain N, Negi A, Angrup A, Ram J. Conjunctival vegetative foreign body in a child mimicking shield ulcer. Indian J Ophthalmol. 2018 ;66(7):991-992.

14. El Kaddoumi M, Cherkaoui O. [Metal accessories for children: when jewelry becomes a real risk of eye loss]. Pan Afr Med J. 2019 ;33:255.

15. Purtskhvanidze K, Saeger M, Treumer F, Nölle B, Roider J. Open globe and penetrating eyelid injuries from fish hooks. BMC Ophthalmol. 2019;19(1):26.

16. Subramaniam S, Pudpud AA, Rutman MS. Fishhook injury to the eyelid: case report and review of removal methods. Pediatr Emerg Care. 2015 ;31(3):209-13.

17. Ratnarajan G, Calladine D, Bird KJ, Watson SL. Delayed presentation of severe ocular injury from a button battery. BMJ Case Rep. 2013;2013.

18. Sen E, Elgin U, Koç F, Oztürk F. A 1.5 cm-long unknown subconjunctival grass inflorescence misdiagnosed as relapsing conjunctivitis for one year. Turk J Pediatr. 2011;53(6):699-701.

19. Betharia SM, Kalra BR. Unusually large conjunctival foreign body (a bean seed). Indian J Ophthalmol. 1985;33(1):69-70.

20. Sakata C, Hiraoka T, Oshika T. Unusually large plastic toy as a persisting conjunctival foreign body. Jpn J Ophthalmol. 2007;51(3):232-4.

21. Gupta PK, Thajjuddin BA, Al Sikri NE, Bangroo AK. Penetrating intracranial injury due to crochet needle. Pediatr Neurosurg. 2008;44(6):493-5.

22. Thompson CG, Kumar N, Billson FA, Martin F. The aetiology of perforating ocular injuries in children. Br J Ophthalmol. 2002 ;86(8):920-2.

23. Arıcı C, Arslan OŞ, Görgülü B, Yıldırım R, Onur U. Eye Injuries from Pencil Lead: Three Cases. Turk J Ophthalmol. 2017;47(1):52-55.

24. Guy JR, Rao NA. Graphite foreign body of the conjunctiva simulating melanoma. Cornea. 1985-1986;4(4):263-5.

25. Amritanand A, John SS, Philip SS, John D, David S. Unusual case of a graphite foreign body in the anterior chamber. Clin Pract. 2011 20;1(3):e73.

26. Hamanaka N, Ikeda T, Inokuchi N, Shirai S, Uchihori Y. A case of an intraocular foreign body due to graphite pencil lead complicated by endophthalmitis. Ophthalmic Surg Lasers. 1999 ;30(3):229-31.

27. Chakraborti C, Mukhopadhya U, Mazumder DB, Tripathi P, Samanta SK. Penetrating ocular fish hook injury: a case report. Nepal J Ophthalmol. 2015 ;7(14):198-201.

28. Iannetti L, Tortorella P. Penetrating fish-hook ocular injury: management of an unusual intraocular foreign body. Case Rep Med. 2014;2014:901285.

29. Habibi S, Agrawal S, Kadel JK, Narsimulu G. Post-traumatic capillary hemangiomas: a rare cause of hand nodules. Clin Rheumatol. 2009 ;28 Suppl 1:S51-2.

30. Moore AT, McCartney A, Cooling RJ. Ocular injuries associated with the use of airguns. Eye (Lond). 1987;1 (Pt 3):422-9.

31. Bowen DI, Magauran DM. Ocular injuries caused by airgun pellets: an analysis of 105 cases. Br Med J. 1973;1(5849):333-7.