CASE REPORT

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Diagnosing Misdiagnosed Anterior Chamber Angle Foreign Bodies by Gonioscopy

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ABSTRACT In the present study, it was reported a 23-year-old male patient, who presented with a penetrating eye injury, involving an anterior chamber reaction resistant to treatment after primary repair and, afterwards multiple glass fragments were detected with the help of gonioscopy at anterior chamber angle (ACA). We strongly suggest that biomicroscopic examination and imaging methods are insufficient to evaluate the presence of intraocular foreign bodies in patients with penetrating eye injuries. Therefore, ACA should be carefully screened through gonioscopy. Although glass is an inert substance, it should be taken into consideration that it rarely causes treatment-resistant anterior chamber reaction.

Keywords: Anterior chamber angle; glass; gonioscopy; intraocular foreign body; corneal penetration

Penetrating eye injuries are a significant cause of vision loss. Intraocular foreign bodies (IOFB) are seen in 18 to 41% of all penetrating eye injuries.[1] They are usually detected by detailed biomicroscopic examination. Delayed diagnosis causes corneal edema, chronic uveitis and endophthalmitis. Also, these are the clues for retained foreign bodies. IOFB may be responsible for a variety of signs and symptoms based on size, composition and location.[2] It has been noted that small pieces of glass may remain stationary in the eye for years, but some may cause irritation and should be removed with forceps, especially when located in the anterior chamber angle (ACA) or on the iris.[3] Glass fragments account for 14% of all IOFB.[4] In the current report, we present a case with resistant anterior chamber (AC) inflammation, multiple small glass fragments in the ACA that could be seen with gonioscopic examination. The removal method of the glass fragments is also presented.

CASE REPORT

The reason a 23-year-old male patient was admitted to the hospital was blurred vision; a glass bottle had been broken on his injured right eye two hours previously. In ophthalmologic examination of the right eye, the best corrected visual acuity (BCVA) was measured as 20/80. There was a 2 mm full-thickness incision in the inferotemporal section of the cornea, and intense AC reaction was observed. Crystalline lens and fundus examination were normal. Likewise, left eye visual acuity and anterior segment examination were unremarkable. In orbital computed tomography (CT), IOFB was not observed. In the first 12 hours, he was operated under general anaesthesia and the cornea was sutured (Figure 1) Topical antibiotic and steroid treatment was started on the first postoperative day. Antibiotic treatment was discontinued at postoperative first week and steroid treatment was

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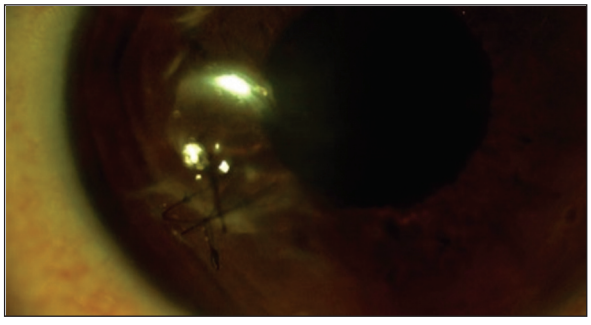

FIGURE 1: Anterior segment image after primary repair of the cornea.

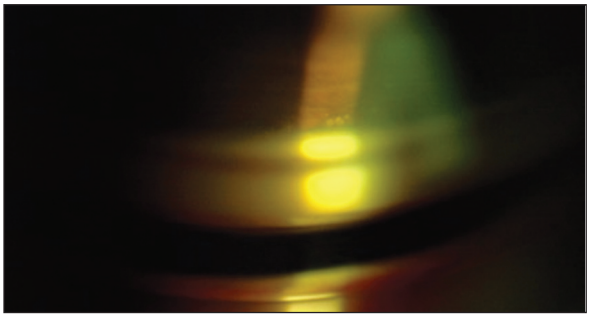

FIGURE 2: Preoperative gonioscopy image of the right eye (multiple, small glass fragments).

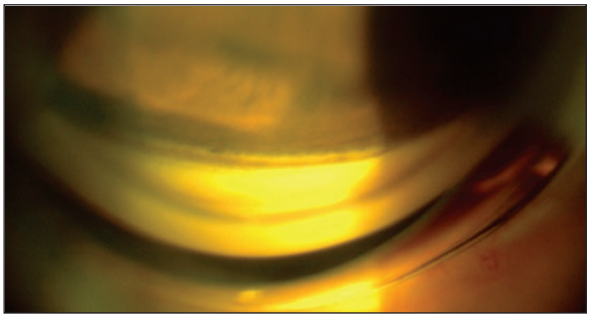

FIGURE 3: Postoperative gonioscopy image of the right eye.

continued due to intense AC reaction. Intense AC reaction was persistent despite intensive steroid treatment in the first postoperative month. Anterior segment optical coherence tomography (AS-OCT) and gonioscopic imaging were performed for IOFB suspicion. No foreign body was detected in the anterior segment with AS-OCT. However, multiple glass fragments were detected through the gonioscopic examination of the ACA (Figure 2). Afterward, steroid dose was increased and followed up for a week. Although glass is an inert material, intense AC reaction can be caused. Therefore, we decided to remove it surgically. At the cornea, two paracenteses were made at the 3 o'clock and 9 o'clock positions and the glass fragments were cleaned with irrigation/aspiration (I/A) cannulas of phaco device. ACA was checked with gonioscopy and the process was terminated when all the glass fragments were removed (Figure 3). AC reaction disappeared at the postoperative first week. Topical steroid therapy was reduced and terminated at two weeks. At the latest follow-up, his vision was improved to 20/30 with normal intraocular pressure and quiet anterior segment.

The patient provided his written informed consent for the publication of the results and the accompanying images.

DISCUSSION AND CONCLUSION

Penetrating eye trauma with IOFB has been frequently reported. It can have significant consequences, including vision loss. Conversely, many reports state that IOFB can be undetectable for years without any complications.[5] Other cases report that they were stable for a period of time and then migrated or caused complications.[5] Source, content of the material, placement and any disturbances linked to the eye are critically important for the management of IOFB.[5]

The presence of IOFB should be considered a long-term and treatment-resistant AC reaction.[6] It can also cause pigmentation and chronic uveitis at the anterior segment.[7] Moreover, prolonged friction of endothelial cells through small IOFB moving into AC causes severe corneal endothelial lesions that increase the risks of corneal edema or decompensation.[8] Inert substances, such as stone, plastic, glass and any metals, including gold, silver or platinum can be tolerated for a long period of time with minimal inflammation. Therefore, their diagnosis can be delayed. In our case, the penetrating injury was caused by a glass bottle containing mineral water, and chronic contact rather than the nature or content of the substance is thought to have caused the inflammation. Inert glass fragments caused a chronic and treatment-resistant AC reaction that was terminated following their removal.

The diagnostic tools used in ocular trauma, including CT, magnetic resonance imaging and ultrasonography can also be used for IOFB localization.[7] Ultrasound biomicroscopy and AS-OCT provide better visualization at the anterior segment structures.[9] However, small IOFB cross-sections may not be seen in AS-OCT. In our case, AS-OCT failed to detect the IOFB, and it was only visible at ACA via gonioscopic examination.

Most IOFB in the ACA is caused by penetrating injury. If it is not removed, an embedded IOFB can become wrapped by an inflammatory membrane. Moreover, limited visualization and narrow space at the ACA make the diagnosis and treatment difficult. [(7)] Various methods have been described in the literature regarding IOFB removal.[10] In conventional removals, most incisions are performed at the closer IOFB embedded position through short steep tunnel incision that can be operated approximately 0.5 mm posterior to the corneal limbus. However, this incision provided limited visibility at the translucent limbus and opaque overlying sclera. Instead of this method, Huang et al. used a prism contact lens and 23-gauge foreign body forceps to perform the removal of a single big piece of IOFB at the ACA through long tunnel corneal incision opposite to the direction of embedded IOFB.[8] Multiple small numbers of IOFB removals at the ACA have not been previously reported. In our case, we thought that the scleral tunnel or foreign body forceps could not be used for removal of multiple small foreign materials.[7] Therefore, they were removed with I/A cannula of the phaco device. The prism contact lens was not required to clean the multiple glass fragments at ACA. Intraoperative gonioscopy is required to confirm that all foreign bodies have been removed from ACA.

In conclusion, biomicroscopic examination and imaging methods may not be sufficient for evaluating the presence of IOFB in penetrating eye injuries. Moreover, ACA should be carefully screened with gonioscopy. That the sophisticated imaging technics can't replace the traditional direct examination methods shows the importance and priority of different examination technics. Although glass is an inert substance, it should be taken into consideration that it rarely causes treatment-resistant AC reaction. The use of I/A cannulas can be an ideal method for removing a large number of small glass fragments at the ACA.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept:*Mehmet Balbaba* ***Design:****Ali Dal* ***Control/Supervision:****Hakan Yıldırım* ***Data Collection and/or Processing:****Murat Erdağ* ***Analysis and/or Interpretation:****Mehmet Balbaba* ***Literature Review:****Ali Dal* ***Writing the Article:****Murat Erdağ* ***Critical Review:****Orhan Aydemir* ***References and Fundings:****Mehmet Balbaba* ***Materials:****Ali Dal.*

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