



CASE REPORT

Managing Traumatic Cataract in the Left Eye Following Blunt Trauma

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Abstract

A major cause of vision loss is eye trauma, which can occur through various mechanisms, including blunt trauma. Cataracts may develop immediately after injury or years later. This case report aims to identify and recognize the symptoms of traumatic cataract and appropriate management strategies in affected patients. A 54-year-old male presented to the Eye Polyclinic of Dr. Zainoel Abidin Regional General Hospital in Banda Aceh with complaints of blurred vision in the left eye, described as foggy, persisting since February 2023, following an accident where his left eye was struck by a motorcycle handlebar. Ophthalmologic examination revealed a visual acuity of 1/300 in the left eye and a cloudy lens. The patient was diagnosed with a traumatic cataract in the left eye due to blunt trauma. Management included lens extraction using the small incision cataract surgery (SICS) method with intraocular lens (IOL) insertion. The patient's vision improved progressively, recorded as 5/24 at the first follow-up, 5/18 at the second follow-up, and 5/9 at the third follow-up, with no other ocular abnormalities noted due to the trauma.

Introduction

Cataracts are the leading cause of blindness in the world. The incidence of cataract formation after ocular trauma is approximately 65% [1]. Ocular trauma is the leading cause of monocular blindness and visual impairment worldwide, although little is known about the epidemiology. Learning or related visual consequences in developing countries. Cataracts are the most common complication after eye trauma [2,3]. Traumatic cataracts usually occur due to penetrating injuries caused by sharp objects directly penetrating the lens or due to trauma from objects such as stones, cricket balls, etc. [4].

Traumatic cataract formation contributes significantly to short- and long-term visual impairment globally [5]. Eye trauma occurs in approximately one-fifth of adults and is more common in men, gender and adolescents [6]. There are an estimated 55 million eye injuries each year, and 1.6 million people lose vision due to traumatic cataracts [7]. The rate of traumatic cataract formation varies globally and is influenced by age, gender, environment, and socioeconomic factors. Although men are more susceptible to eye damage when participating in outdoor activities, gender does not significantly influence vision outcomes. Young people are more susceptible to eye damage but respond well to treatment [8], such as the patient in this case report who experienced traumatic cataracts at the age of 54 years. The patient complained of blurred vision in the left eye, which had been felt for a long time, but the patient was not too late in coming to the doctor to improve his vision, and there were no complications in the patient, so the treatment was successful. Namely, the patient's left eye vision became clearer.

Because traumatic cataracts cause significant visual impairment in young people, it is necessary to assess the damage they cause and treat them with timely interventions to restore vision as

soon as possible. A detailed medical history, comprehensive examination, and a clear management plan can result in better visual outcomes [4]. Methods used to evaluate visual outcomes in eyes treated for cataracts Traumatic and senile cataracts are similar. Still, the damage caused to other eye tissues due to trauma may affect increased vision in eyes operated for traumatic cataracts. Postoperative inflammation is a common complication after traumatic cataracts, which can reduce visual function. Other complications leading to postoperative vision loss are corneal scarring, uveitis, secondary glaucoma, miosis, posterior capsule opacification, and retinal scarring [4]. Several guidelines for ocular trauma have been published to assist in the determination of the visual prognosis [9].

This case report focuses on the presentation and management of lens injury and traumatic cataracts. Therefore, this case report aims to identify and recognize the symptoms of cataracts and appropriate management in a patient with traumatic cataracts. By doing so, this case report seeks to contribute to better diagnostic and therapeutic approaches, ultimately enhancing visual outcomes for patients suffering from traumatic cataracts.

Cases

Inclusion and Exclusion Criteria

The study included patients over the age of 50 from both genders who were diagnosed with cataracts and provided informed consent to participate. Patients with any other ocular disorders, such as those affecting the cornea, vitreous, or retina, as well as those with glaucoma, were excluded from the study. Additionally, individuals with a history of uveitis, trauma, neovascularization, or past ocular surgery were not considered for inclusion.

Case Presentation

The 54-year-old male patient came to the Eye Polyclinic of Dr. Zainoel Abidin Banda Aceh Regional General Hospital with complaints of blurred vision in his left eye, described as foggy, which he had been experiencing for the past eight months (since February 2023) and had worsened in the last two months (since August 2023). Eight months ago, the patient's eyes began to feel blurred after the patient had a motorcycle accident and the motorcycle handlebar hit the left eye. The patient was treated for four days because of bleeding in his left eye. In the past two months, the left eye's blurred vision has felt increasingly aggravated. The patient also complained of glare when looking at or car lights at night. Color vision is not impaired. The patient also complained of occasional dizziness. Other complaints, such as pain in the eye and red eye, are not complained of by the patient. The patient has no history of diabetes or hypertension.

On an ophthalmologic examination with the Snellen chart, the patient's left eye visus was 1/300, while the right eye virus was normal at 6/6. Based on an ophthalmologic examination using a Biovid brand slit lamp. The oculars of the slit lamp were set at '0' and adjusted interpupillary distance like binoculars and white light or neutral density. It was found the corneas of both eyes are clear; the pupils are round, the light reflex is positive, and the pupil diameter is 2-3 mm. The right eye lens before surgery is clear, as seen in Figure 1, and the left eye lens before surgery appears completely cloudy, as seen in Figure 2. The results of the Tomey brand ultrasound examination of the left eye before surgery show the back wall of the eyeball intact and clear vitreous, as seen in Figure 3. Eyeball pressure (Rodenstock brand non-contact tonometer obtained right eye pressure 18 mmHg and left eye 16 mmHg. The patient was also examined for Rodenstock keratometry, where the patient's IOL size was 20.50 D. The patient's left eye was performed SICS + IOL on October 18, 2023, as shown in Figure 4.

In the preoperative protocols, we prepare the patient to start with preoperative NSAIDs and antibiotic eye drops 3-7 days before surgery. With the patient lying supine on the table, we identified the right eye, cleaned the eye with 10% povidone-iodine, and applied topical povidone iodine to it. The eye is then draped, and a speculum is placed to keep it open for surgery.

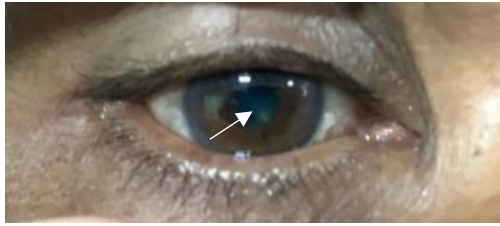


Figure 1. Right eye before surgery.

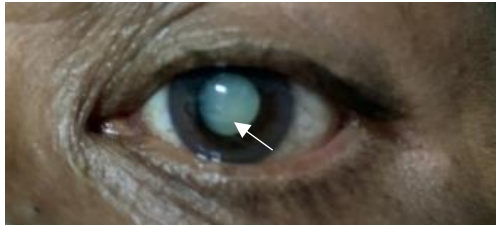


Figure 2. Left eye before surgery.

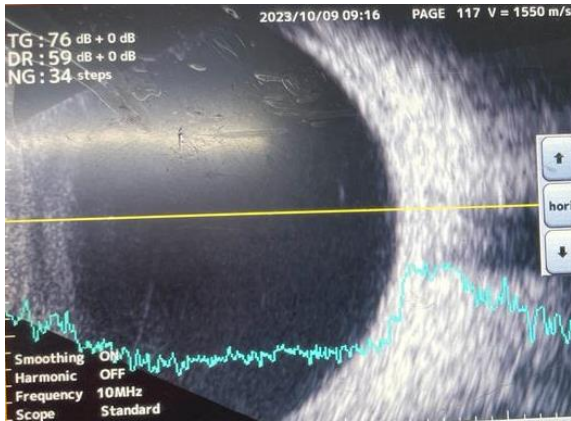


Figure 3. Ultrasound examination of the left eye before surgery.

The details of the patient's surgical technique are that first, the patient was operated on under topical anesthesia. After attaining adequate mydriasis, a superior rectus bridle suture is placed. A fornix-based conjunctival flap is created, and hemostasis is achieved with bipolar diathermy cautery. A curvilinear partial-thickness scleral incision is made 3 mm posterior to the limbus. The depth is made 0.3 mm. Then, we create a paracentesis. A paracentesis is made at the 9 o'clock position using a 24-gauge, 15-degree lancet tip blade. Making the internal corneal incision, capsulorhexis, and nucleus delivery. Residual cortex aspiration and implantation of a posterior chamber IOL. Sealing the paracentesis port. Once the port site is sealed, the anterior chamber deepens, and the globe becomes firm. The tunnel is then checked for integrity. Finally, the conjunctiva is apposed gently by bipolar diathermy cautery.

Then postoperative medical therapy was given, namely oral antibiotics 2x500 mg, non-steroidal anti-inflammatory 3x50mg, eye drops (antibiotics + steroids) 6x1 drops a day. Postoperatively, the patient was educated to maintain eye hygiene, use medication regularly as directed, avoid excessive water, smoke and dust.

At the first follow-up (October 19, 2023), the patient said that the vision in his left eye had improved, and he could see clearly. On ophthalmologic examination, the patient's OS vision increased to 6/24 from the previous 1/300, hyperemic bulbous conjunctiva, minimal corneal edema, anterior camera oculi formed with minimal flare/cell, positive light reflex, round pupils 2-3 mm in diameter, and a positive OS IOL appeared. At the second follow-up (October 30, 2023), the patient's visus was 6/18, the conjunctiva bulbi appeared minimally hyperemic, the

cornea was clear, the flare/cell was negative, the light reflex was positive, the pupil was round 2-3 mm in diameter, and the IOL OS appeared positive. On the third follow-up (November 17, 2023), the patient's visus was 6/9, the conjunctiva bulbi of the left eye was not hyperemic, the cornea was clear, the light reflex was positive, the pupil was round with a diameter of 2-3 mm, the anterior chamber was formed normally, and the IOL of the left eye after surgery was positive as seen in Figure 4. The patient was prescribed glasses with plano right eye size, cylindrical left eye 0.5 axis 900 with Based Corrected Visual Acuity (BCVA) 6/6.



Figure 4. Left eye after surgery.

Discussion

When assessing acute ocular trauma, a thorough evaluation is essential to determine the severity of the eye injury [4,8]. Physical examination should carefully evaluate visual acuity, pupillary function, and intraocular pressure. Slit lamp biomicroscopy and fundus examination. Identifying signs of zonular damage, such as phakodonesis, focal iridodonesis, vitreous prolapse, and lens subluxation, is essential, although these signs may not always be present [8]. Signs of lens injury include seeing the lens equator when viewing eccentrically, a nucleus that is not centered in the primary position, iridolenticular fissures, or changes to the lens edge contour. Cataract formation within minutes to hours after eye trauma may indicate disruption of the anterior lens capsule.

A complete examination of the case was carried out before surgery was decided, namely a vision examination, anterior segment examination of the eyeball with a slit lamp, posterior examination of the eyeball with ultrasound, measurement of eyeball pressure, and keratometry measurement to determine the power diopter of the IOL. Ultrasound examination is indicated in conditions of cloudy refractive media, in this case, lens opacities (cataracts), where the cloudy refractive media is a barrier to evaluating the posterior segment. Posterior segment examination is important to determine the prognosis of post-surgical visual function where the impact of trauma can affect all ocular tissues, such as vitreous hemorrhage and retinal hemorrhage.

Cataracts formed as a result of trauma can appear immediately after the trauma and can also form several years after the trauma. The patient complained of blurred vision eight months after the trauma, and in the last two months, it has worsened, interfering with daily activities. The definitive management of cataract patients is surgery. The patient underwent surgery to clear the visual axis. Cataract extraction was performed using the SICS + IOL technique, as shown in Figure 5. This technique was chosen to reduce post-surgical astigmatism by incising the sclera (not involving the cornea). Actions are carried out carefully because considering trauma can cause other ocular abnormalities such as posterior capsule rupture or zonular dehiscence or detachment of the lens from the lens hanger, namely zonular zinnii. In this case, the posterior capsule was found to be intact so that IOL insertion could be performed. IOL insertion is always sought in cataract extraction. In addition to achieving the expected visual function, IOL insertion is used to maintain normal anterior segment conditions after cataract extraction. Without IOL insertion, the vitreous body may push or press forward, narrowing the angle of the anterior chamber.

From the examination results after SICS surgery, it was found that the patient's vision continued to improve. The patient's visual acuity before and after surgery can be seen in Table 1. It can be

seen that the patient’s left eye visual acuity before surgery was 1/300, and after surgery, the patient's visual acuity became 6/9 at the third follow-up.

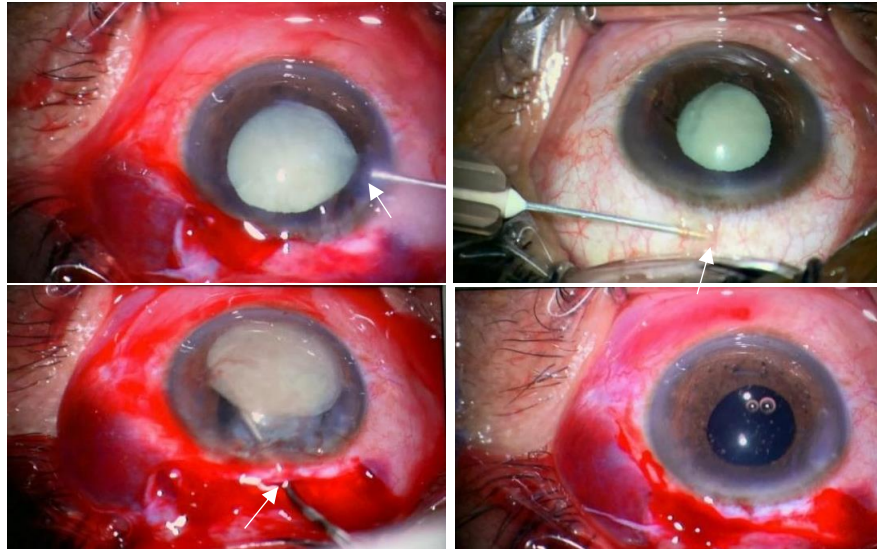


Figure 5. Patient Small Incision Cataract Surgery (SICS) operation documentation.

Table 1. Patient’s visual acuity before and after surgery.

Date	Visual Acuity of the Right Eye	Visual Acuity of the Left Eye
October 18, 2023 (before surgery)	6/6	1/300
October 19, 2023 (the first follow-up after surgery)	6/6	6/24
October 30, 2023 (the second follow-up after surgery)	6/6	6/18
November 17, 2023 (the third follow-up)	6/6	6/9

The results of this study are similar to those of similar studies that showed that visual acuity improved significantly after traumatic cataract extraction. Satisfactory visual acuity was achieved in most cases. Eyes with open-globe injuries may have a less favorable visual prognosis. Refractive outcome was similar in open and closed injuries [8]. Some factors that contribute to the success of a patient's therapy, such as initial visual acuity, pupillary reflex response, and the severity of the trauma, are essential in this assessment. This activity provides a comprehensive guide to the management of lens injury, especially traumatic cataracts, including preoperative sterilization and disinfection, surgical indications, and timing. With this approach, patients can receive the appropriate treatment and care, resulting in better visual outcomes after ocular trauma [10].

Early complications that can occur in traumatic cataract patients after surgery are corneal edema and mild to moderate inflammation. Delayed complications have included posterior capsular opacification, glaucoma, cystoid macular edema, and even retinal detachment. To prevent complications, the patient has a complete examination before surgery, namely a vision examination, anterior segment examination of the eyeball, posterior examination of the eyeball measurement of eyeball pressure, and keratometry measurement to determine the power diopter of the IOL. Posterior segment examination is important to determine the prognosis of post-surgical visual function where the impact of trauma can affect all ocular tissues, such as vitreous hemorrhage and retinal hemorrhage.

Conclusions

The incidence of traumatic cataract formation varies globally and is influenced by age, gender, environment, and socioeconomic factors. However, more outdoor activities make men more susceptible to eye injuries. Blunt trauma to the oculi can cause cataracts both immediately after the trauma and over time. Visual function after traumatic cataract extraction is highly variable as it is influenced by several factors, depending on the extent of damage and involvement of other ocular tissues due to the trauma. The patient's visual acuity in this study significantly improved after traumatic cataract extraction. The limitation of this study is a short follow-up of the patient. For future research, the follow-up of the present study was short, and long follow-up studies are needed to evaluate the long-term results of IOL implantation in traumatic cataracts.

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Informed Consent Statement: Written informed consent has been obtained from the patient to publish this paper.

Data Availability Statement: This article includes all the data supporting the results.

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Conflicts of Interest: All the authors declare no conflicts of interest.

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