



CASE REPORT

Management of Adnexa Foreign Body: A Piece of Mica From a Broken Helmet

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**Abstract**

Introduction: Adnexa foreign body is one of the classifications of extraocular foreign body. Visual prognosis depends on the zone of injury, type, and size of the foreign body and subsequent complications. **Case Presentation:** A 5-year-old girl came to the outpatient clinic with her parent with chief complaints of swelling and pain in the lower eyelid in the left eye after she had a motorcycle accident with her parent (single accident) five months ago. At the time, the patient was hit by a piece of mica from a broken helmet in her left eye, and the patient complained that her left eye was red swollen and that she had difficulty opening her eyes and; when the midwife then referred her to an ophthalmologist in Jember and referred to Soetomo with diagnosis conjunctival tumor in LE. Visual acuity RLE 5/5, and in the conjunctiva, there was hyperemia and foreign body like glass or mica in fornix inferior. In the CT scan, there was foreign body or corpus alienum with size 1.05 x 0.5 x 2.1 cm in cutan subcutan left inferior eyelid until ciliary body and swelling in tissue around corpus alienum. The patient was the plan to extract the foreign body. **Conclusion:** Adnexa foreign body is one emergency case in ophthalmology. The extraction technique depends on the object's composition and size because it impacts the step of the operation technique.

Keywords: adnexa foreign body; ocular foreign body; management ocular foreign body; management adnexa foreign body

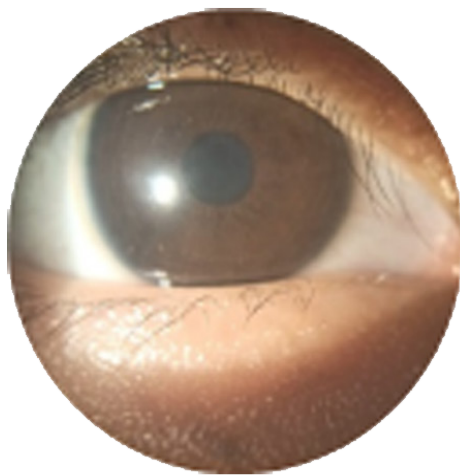
Introduction

Adnexa foreign body is one of the classifications of extraocular foreign body and one of the emergency cases in ophthalmology. The visual prognosis depends on the zone of injury, type, and size of the foreign body and the subsequent complications. Napora et al.^[1] analyzed the material, quantity, size, and site of the entrance and final ocular foreign body, it was metallic 85% and 15% others. A retrospective study of metallic orbital foreign bodies showed that 89% of cases were associated with other ocular injuries, including corneal abrasion, iritis, or retinal detachment.^[1] Subsequent damage depends on the composition and position of the foreign body.^[2]

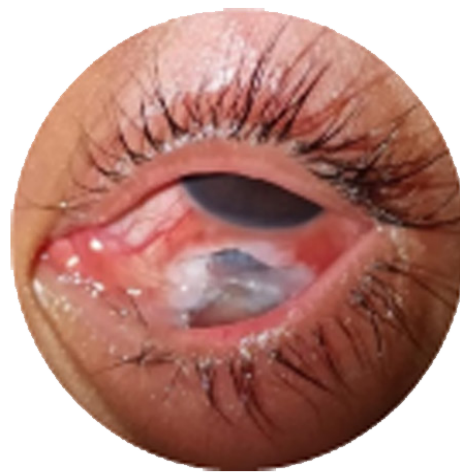
Visual acuity, anterior segment examination, and the port of entry of the foreign body should be examined and documented.^[3] Localization of the foreign body is the prime aspect of management. The first question is whether the foreign body is in the eye (anterior or posterior) or orbit. Computed tomography (CT Scan) provides much more reliable information regarding the foreign body's size, shape, and localization and is the preferred imaging modality.^{[3],[4]} A delay in management can increase the risk of infection. The definitive management is surgical. This case explains the technique of foreign body extraction and is very important to certain the material and mechanism of injury because the extraction technique depends on the object's composition and size.^{[3],[4]}

Case presentation

A 5-year-old girl came to the outpatient clinic with her parent with the chief complaints of swelling and pain in the lower eyelid in the left eye after she had



RE



LE

Figure 1. Clinical picture of the patient; there was edema in the left eyelid inferior. The anterior segment of the patient RE was within normal limits, and in LE, there was a foreign body like glass or mica in the fornix inferior.

a motorcycle accident with her parent (single accident) five months before admission. At the time, the patient was hit by a piece of mica glass from a broken helmet in her left eye and the patient complained that her left eye was red and swollen together with had difficulty opening her eyes. She went to a midwife and was then referred to an ophthalmologist in Jember Regency and referred to Dr. Soetomo General Hospital Surabaya with a diagnosis of conjunctival tumor in the left eye.

The visual acuity examination RLE was 5/5. Intraocular pressure (IOP) RLE were normal palpation. From anterior segment examination, there was edema in the left eyelid inferior and spasm. In the conjunctiva, conjunctiva injection and foreign bodies like glass or mica in the inferior fornix conjunctiva. For the cornea, anterior chamber depth, iris, pupil, and lens were within normal limits. Ocular motility was challenging to evaluate

because there was a limitation to seeing inferior LE. The posterior segment examination for RE was within the normal limit; however LE was difficult to evaluate. From orbital computerized tomography (CT) scan examination, there was a foreign body or corpus alienum with size 1.05 x 0.5 x 2.1 cm in cutan subcutan left inferior eyelid until ciliary body and swelling in tissue around the corpus alienum. Laboratory examinations were within normal limits. This patient was diagnosed with LE adnexa foreign body, a piece of mica helmet or glasses. This patient was treated with general anesthesia after the LE eyeball exploration, exam under anesthesia (EUA), and corpus alienum extraction operation.

From intraoperative procedure findings, EUA results: IOP RE 14.6 mmHg and IOP LE 5.9 mmHg. Posterior segment examination within normal limit. Operating finding subconjunctival bleeding inferiorly (around

the wound), corpus alienum shard of mica glass in the inferior fornix, size 3.2 x 1.1 cm sharp edges, irregular, does not penetrate the sclera, the superior end of the corpus alienum indents the conjunctiva 2 mm inferior to the limbus. Durante operative procedures were performed with bridle sutures on the lateral and medial, extraction of the corpus alienum on the inferior fornix, and there was an obstacle. A canthotomy cantholysis is performed on the lateral canthus to expand the operating area, control bleeding with bipolar cautery, extraction of the foreign body or corpus alienum using tweezers, given cefazolin antibiotic around the wound and on the ocular surface, conjunctival peritomy were performed in the wound area using Wescott scissor and uneven conjunctival margins and excision of granulomas, conjunctival peritomy at 2 mm below the inferior limbus, sutured conjunctiva using vicryl 8.0, lateral canthus suturing with vicryl 8.0, dexamethasone, and gentamicin injection subconjunctival.

after surgery. Follow up 1-2 weeks after surgery; there was no additional complaint.

Discussion and conclusions

Adnexa foreign bodies are foreign bodies in the adnexa. (in orbit, lids, conjunctiva, and lacrimal apparatus). The foreign body may be in the palpebral conjunctiva, bulbar conjunctiva, or upper or lower fornix in the conjunctiva. This patient’s foreign body was in the lower fornix. Napora et al.^[1] analyzed the material, quantity, size, and site of the entrance and final ocular foreign body. It was metallic 85% and 15% others. The visual prognosis depends on the zone of injury, type, and size of the foreign body and the subsequent complications. In the study conducted by Fulcher et al.^[5], 55% of foreign matter is made of inorganic metallic, 32.5% organic, and 12.5% inorganic non-metallic materials. Meanwhile, Napora et al.^[1] reported 85% of cases of metallic foreign bodies. In the reported cases of metallic orbital foreign bodies, most of the entry point

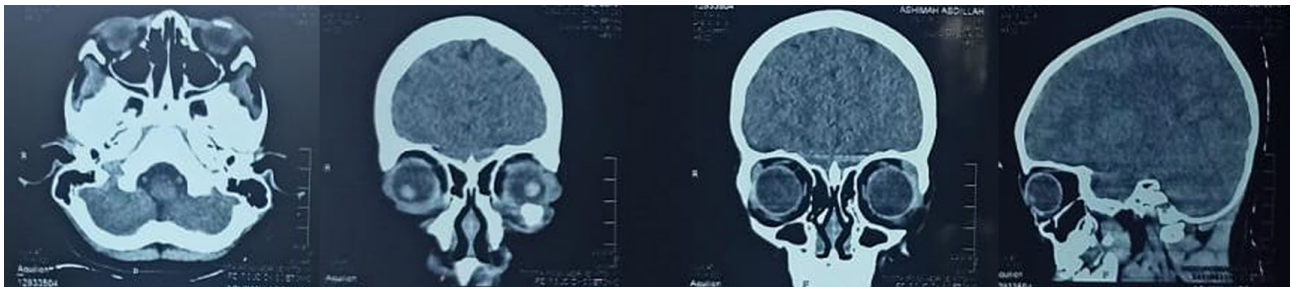


Figure 2. Orbital CT scan; there was corpus alienum with size 1.05 x 0.5 x 2.1 cm in cutan subcutan left inferior eyelid until ciliary body and swelling in tissue around the corpus alienum.

Therapy post-operation were cefadroxil syrup 200 mg every 12 hours, paracetamol syrup 200 mg every eight hours, levofloxacin eyedrop--one drop every 6 hours left eye, and fluorometholone eyedrop--one drop every 6 hours left eye. This patient was followed up the next day after surgery, with minimal pain in the left eye. The therapy was levofloxacin eyedrop one drop every 6 hours LE, fluorometholone eyedrop one drop every 6 hours LE, paracetamol syrup 200 mg every 8 hours orally, and cefadroxil syrup 200 mg every 12 hours orally. The patient was plan go home and be evaluated one week

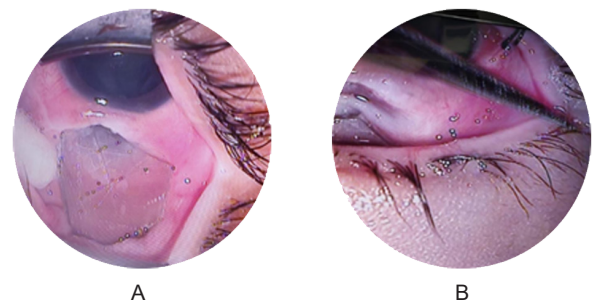


Figure 4. Durante operation doing canthotomy cantolysis to expand the operating area; (A) extraction of the corpus alienum in the inferior fornix but there is obstacle, and (B) Cantotomy cantolysis to expand the operating area.

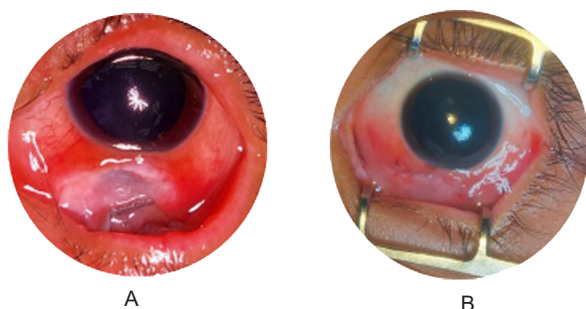


Figure 3. Before and after extraction of adnexa foreign body; (A) before extraction of the corpus alienum, and (B) after extraction of the corpus alienum.

(port d’entrée) is on the eyelids and conjunctiva.^[1] The classification composition of ocular foreign body materials varies in each literature. Basically, the composition of materials can be classified into organic and inorganic materials.^{[6],[7],[8]} Non-organic materials can be further classified into non-organic metallic and non-organic non-metallic. Examples of organic materials are animal and plant materials, such as wood and leaves. ^{[6],[7],[8]} Non-organic ingredients metallic examples are iron, copper, tin, lead, and other metal materials. Non-

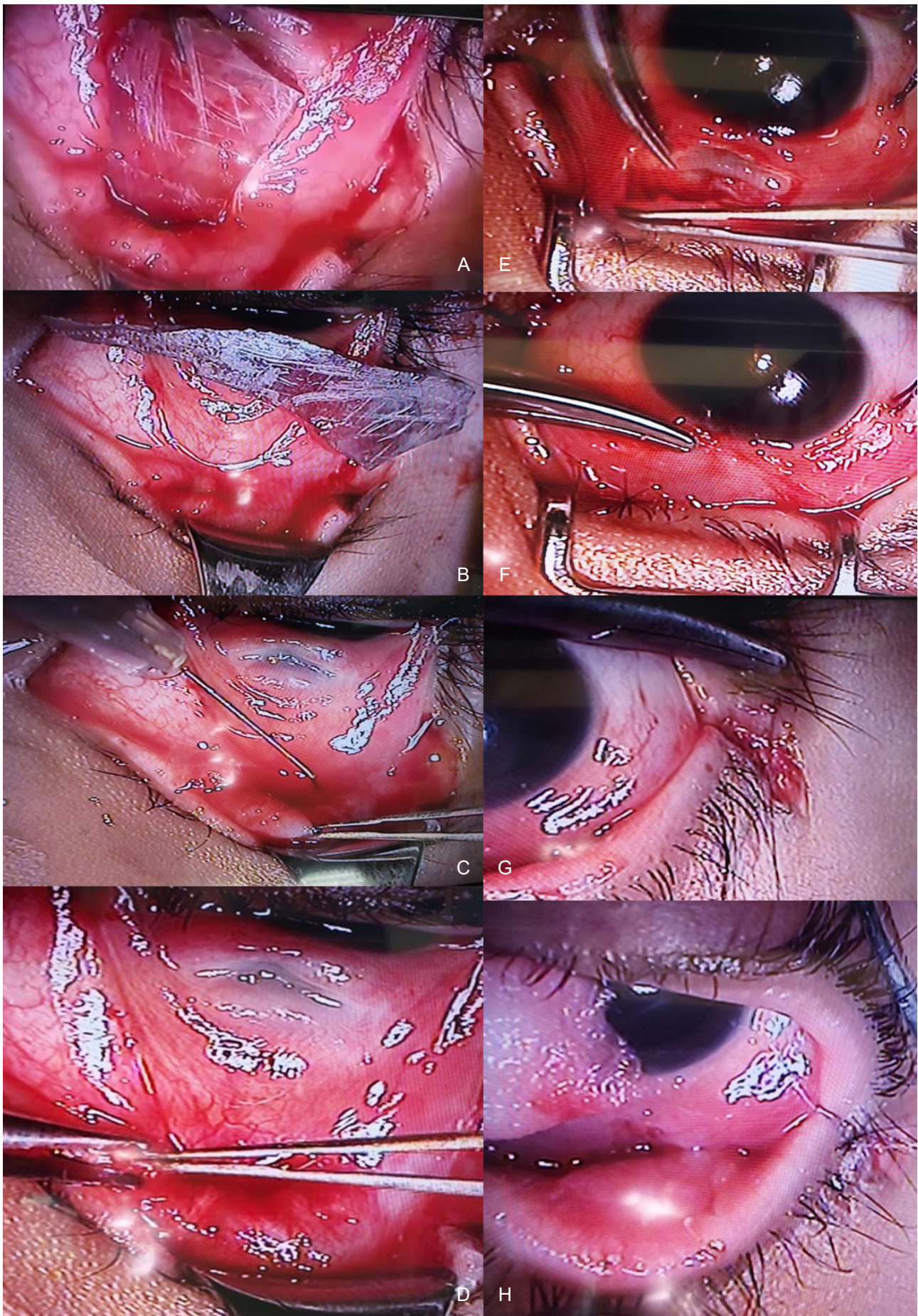


Figure 5. Durante operation extraction of the foreign body until post cantoplasty; (A) Extraction of the corpus alienum using forcep; (B) Extraction of the corpus alienum; (C) Give an antibiotics around the wound; (D) Excision of granulomas; (E) Conjunctival peritomy at 2 mm below the inferior limbus; (F) Conjunctiva suture using vicryl 8.0; (G) Suture cantotomy cantolysis with vicryl 8.0; and (H) Post cantoplasty.

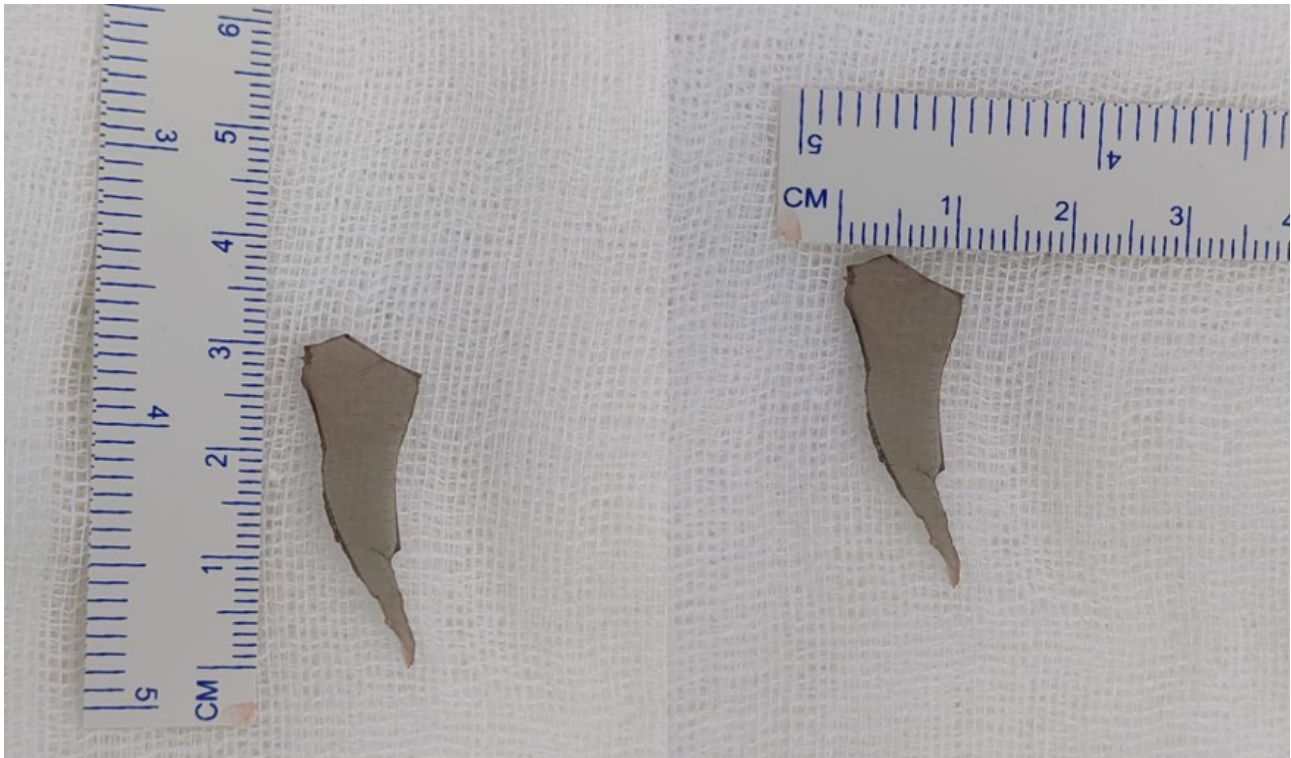


Figure 6. Corpus alienum, a piece of mica in the inferior fornix, size 3.2 x 1.1 cm with sharp edges and irregular.

metallic non-organic materials, for example, are plastic, glass, fiberglass, and stone.^{[6],[7],[8]} The composition of ocular foreign body ingredients is also essential because it predicts their chemical reactions to orbital organs.^{[6],[7],[8]} This is related to the toxicity of the foreign body. The more inert the foreign body, the less it causes toxicity to the orbital organs.^{[6],[7],[8]} Non-metallic non-organic materials, the majority are inert materials, while organic materials often cause inflammation and infection due to reactions with orbital organs.^{[6],[7],[8]}

Organic matter is rare in the orbit because it is toxic and can cause severe reactions and complications, such as orbital abscess, orbital cellulitis, proptosis, chronic fistulae, extraocular muscle disorders, and optic nerve.^{[9],[10],[11]} For objects that are inert, such as glass, plastic, porcelain, gold, silver, and platinum, no reaction occurs with the orbital tissue. Aluminum material may cause

local irritation reactions. Meanwhile, ingredients pure copper, zinc, nickel, and mercury can cause inflammation and suppuration reactions in the orbital.^{[9],[10],[11]} Orbital foreign body containing iron can cause a disorder called siderosis. Siderosis usually occurs between two months to two years after the trauma. Siderosis has been reported within nine days of the trauma. Iron particles undergo separation from electrolytic to ferrous ions.^{[9],[10],[11]} This ion spreads in the orbital tissue and reacts with intracellular proteins causing degenerative changes in the epithelial structure of the orbital tissue. Copper material can cause suppuration and necrosis reactions in orbital tissue.^{[9],[10],[11]} The disorder caused by this copper material is called chalcosis. The copper ion from orbital foreign body underwent electrolytic separation and deposited in membrane-bound structures in the orbital tissue.^{[9],[10],[11]} Unlike iron ions, copper ions do not undergo

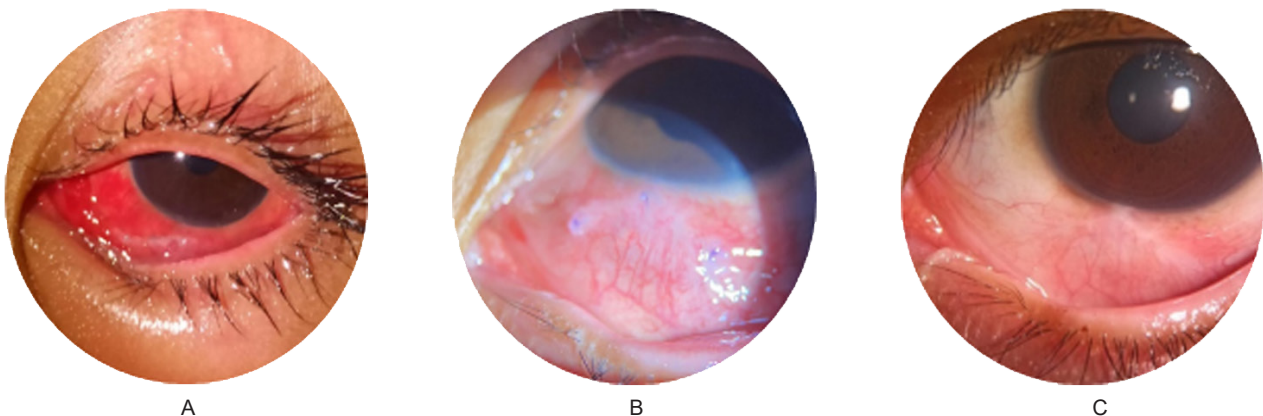


Figure 7. (A) Day one after surgery; (B) One week after surgery; and (C) Two weeks after surgery.

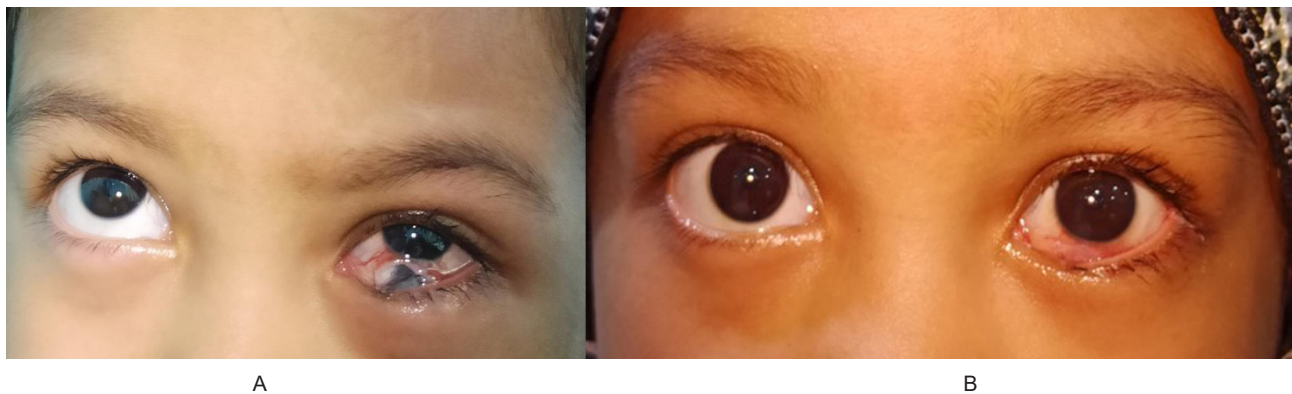


Figure 8. (A) Before surgery and (B) After surgery.

chemical reactions with protein cells, so they do not cause degenerative changes in the orbital tissue. Orbital foreign body which is organic and toxic, can cause orbital complications.^{[9],[10],[11]} The complications that can occur from the orbital foreign body are proptosis, chronic fistula, orbital abscess, orbital cellulitis, extraocular muscle damage, or intracranial nerve damage infection until blindness hits the eyeball.^{[9],[10],[11]}

In this case, The material foreign body is plastic or mica glass helmet (inert material) and rarely causes an inflammatory reaction so that the patient does not know there is a foreign object in his body or feels the need to take treatment. No reaction occurs with the orbital tissue for inert objects, such as glass, plastic, porcelain, gold, silver, and platinum. Five months after the accident, the patient feels pain and red eye because of the foreign body and the definitive Management is surgical by extracting the foreign body. The position of the foreign body is in the fornix. Adnexa foreign body in fornix is challenging because narrow of operating space. The operator was doing canthotomy cantolisis to expand the operating space. It is necessary to determine the position of the foreign body because the surgical approach will vary. The extraction technique depends on the object's composition and size. It is essential to the certain material type of the foreign body and mechanism of injury because it impacts the step of operation technique.^{[1],[11]}

In practice, Birmingham eye trauma terminology (BETT) only concerns mechanical eyeball injury. As a result, orbital and ocular adnexa injury cannot be classified by BETT, which consists of nearly 1/3 of all mechanical eye injuries.^[12] Foreign body injuries in the orbital region can be treated with a combination of clinical suspicion, basic knowledge, and diagnostic tests, depending on the surgeon's skill and experience.^[13] Eye injury prevention efforts that consider the age, gender, and developmental stage of children. Educating parents and children about the potential for eye injuries at home and during hazardous activities is an important public

health goal. Reliable classification of ocular injuries may provide important information about the prognosis of injuries with intraocular or orbital foreign bodies.^{[14],[15]}

Adnexa foreign body is one of the emergency cases in ophthalmology. Adnexa foreign bodies are one classification from the extraocular foreign body, and the definitive Management is surgical, and the surgical approach will vary. The extraction technique depends on the composition material, the size, and the position of the object because it will impact the step of the operation technique.

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