A case report of a patient with spontaneous retrobulbar hemorrhage

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Abstract

Introduction: Retrobulbar hemorrhage (RBH) is a potentially blinding consequence of orbital trauma that can lead to orbital compartment syndrome (OCS). Although RBH commonly follows trauma, spontaneous cases have been reported, often associated with coagulopathies, thrombolytic therapy, lymphangiomas, or Valsalva maneuvers. In some cases, however, no risk factors are identified. OCS should be suspected in the presence of declining visual acuity, proptosis, raised intraocular pressure, a tight orbit, relative afferent pupillary defect, intraocular vascular changes, or restricted eye movements. Timely recognition of RBH is essential to prevent ischemic blindness.

Case report: We report a 17-year-old healthy female who presented with sudden right eye proptosis, reduced ocular motility, and visual decline. She denied trauma or medication use. Initially treated for orbital cellulitis with intravenous antibiotics for a week without improvement, she was referred to our facility. Examination suggested OCS, prompting emergency canthotomy and cantholysis, followed by orbitotomy, which evacuated about 10 mL of blood. Postoperatively, proptosis resolved, but vision remained no perception of light. This case highlights the rarity of spontaneous RBH and the importance of maintaining a high index of suspicion in acute proptosis. It also underscores the role of prompt imaging and intervention in preserving vision.

Conclusion: RBH with OCS is an ophthalmic emergency requiring urgent diagnosis and management to prevent irreversible vision loss.

Key words: Retrobulbar hemorrhage, proptosis, canthotomy, cantholysis.

Introduction

Retrobulbar hemorrhage is the phenomenon of blood collecting in the retrobulbar space behind the globe (1). The hemorrhage usually follows trauma to the orbit but can also occur following orbital surgery. Although a rare phenomenon, it carries a high risk of blindness. The incidence of retrobulbar hemorrhage following orbital trauma has been reported to be less than 1 percent (2). It has also been noted, nonetheless, that the incidence of blindness associated with retrobulbar hemorrhage could be as high as 48% (2). It can be safely presumed that spontaneous retrobulbar hemorrhage is rarer. Blindness from RBH is a consequence of OCS which results to ischemia to the retina and optic nerve.

The upper limits of normal for adult bony orbit, soft tissue exclusive of the globe, orbital fat, and muscle are 30.1 cm3, 20.0 cm3, 14.4 cm3, and 6.5 cm3, respectively(3). Due to the limited elasticity of the orbital septum and the tarsus, there is little room for expansion. Retrobulbar hemorrhage increases intra-orbital volume and further increases intra-orbital pressure. Bleeding commonly originates from the infra-orbital artery, anterior and posterior ethmoidal arteries. When the intra-orbital pressure exceeds the pressure in the central retinal artery and the ophthalmic artery, blood flow in the vessels stops, causing ischemia of the retina, optic disc, and other ocular tissues, and eventually irreversible vision loss (4). Clinically, most patients treated within 2 hours will achieve a final Snellen visual acuity better than 6/12(5).

We present a rare case of spontaneous retrobulbar hemorrhage in a 17-year-old female.

Case report

V.M., a 17-year-old otherwise healthy female, presented as a referral with complaints of protrusion of the right eye for 12 days. She reported no history of trauma to the right

orbital region and had no known history of easy bruising nor any known comorbidities. She reported initially having a headache, which was not relieved by over-the-counter analgesics followed by decreased right eye movements and later protrusion of the right eye. She was managed at the peripheral facility on intravenous antibiotics for 7 days for what was initially thought to be orbital cellulitis and later referred when no improvement in signs and symptoms was noted.

At our casualty, the blood pressure, pulse rate, and temperature were within normal limits. Vision in the right eye was an inaccurate projection of light. Extraocular motility was severely limited in all gazes. She also had marked protrusion of the right eye with swollen and tight eyelids with mucoid discharge. She had massive conjunctival chemosis with a central corneal epithelial defect approximately 5 by 7 millimeters. Her right pupil was mid-dilated and also had a pale retina, hyperemic optic disc with a cherry red spot at the macula. Her intraocular pressures were 18mmHg and 19mmHg, respectively. The left eye examination was normal.

In view of the examination findings, she underwent canthotomy and cantholysis at casualty before undergoing a CT scan of the head and orbit. The CT scan revealed a retrobulbar hyperdense opacity in the right orbit with resultant proptosis. There were no bony fractures and nor intracranial lesions.

The patient was admitted and underwent a right eye orbitotomy, where approximately 10 milliliters of blood were extracted behind the right globe.

Postoperatively, at 6 months, vision was non-perception of light in the right eye, had a fixed mid-dilated pupil with a pale disc. There was however no proptosis, had a clear cornea with a deep anterior chamber.

Figure 1: Patient's initial presentation at our casualty. Of note is the obvious proptosis of the right eye, periorbital edema, matted lashes and chemosis. (© Dr. Lydia Muoki)

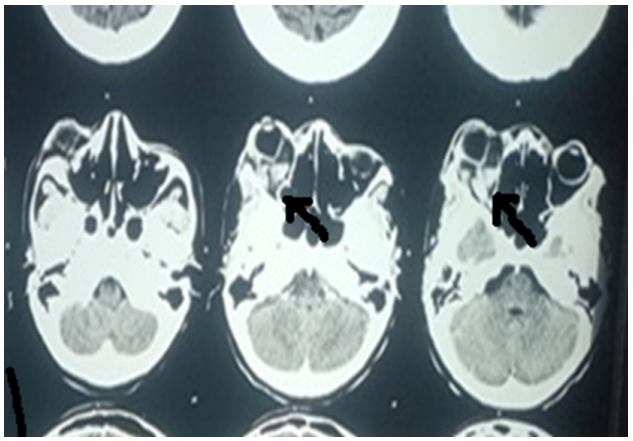

Figure 2: Axial CT cuts showing retrobulbar right eye hyperdense opacities causing proptosis and no intracranial lesions (arrowheads). (© Dr. Lydia Muoki)

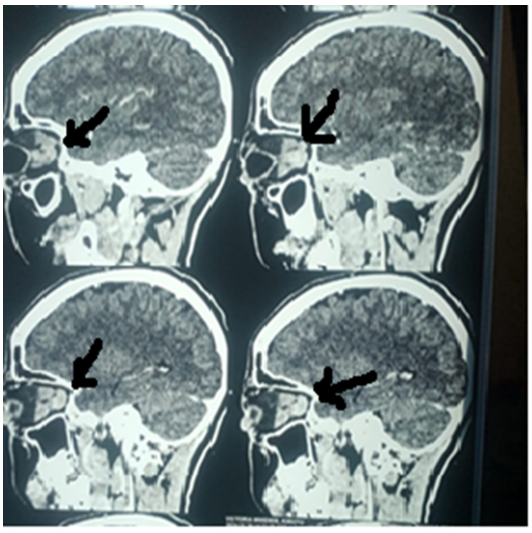

Figure 3: Sagittal cuts revealing right retrobulbar hemorrhage (arrowheads). (© Dr. Lydia Muoki)

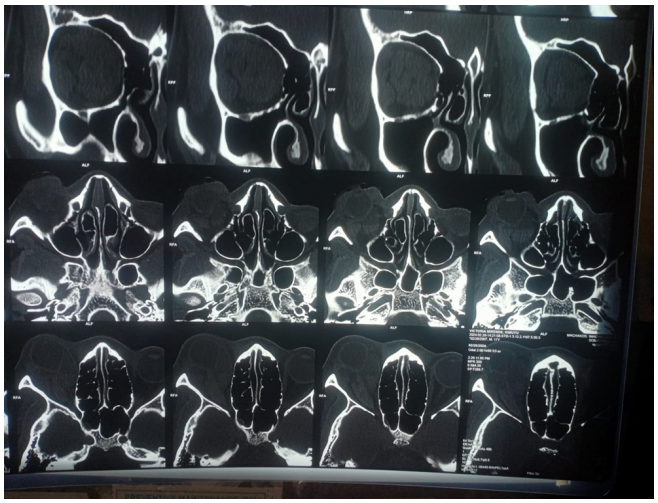

Figure 4: No fractures on the bone window of her CT scan. (© Dr. Lydia Muoki)

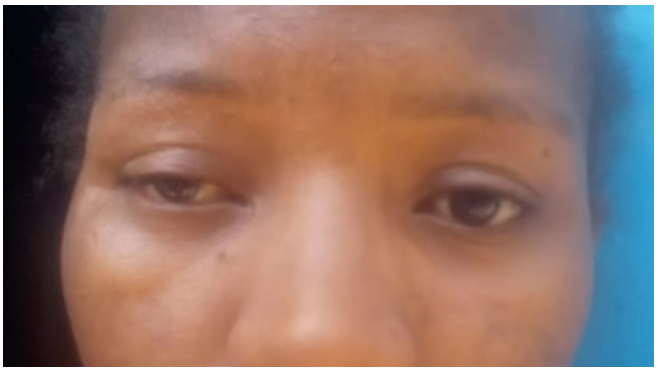

Figure 5: Patient 6 months postoperatively. (© Dr. Clive Chemiati)

Discussion

Retrobulbar hemorrhage is a rare complication of trauma to the midface. It can also occur secondary to orbital surgery. Spontaneous cases have also been documented. In many times, these spontaneous cases, there is a history of predisposing factors, e.g., taking non-steroidal anti-inflammatory drugs, orbital vascular malformations like varices, lymphangiomas, while in others, there was no tangible explanation (6,7).

Symptoms of retrobulbar hemorrhage include pain disproportionate to the injury, loss of vision, protrusion of the globe, and ophthalmoplegia. Signs include proptosis, elevated intraocular pressures, periorbital ecchymosis, subconjunctival hemorrhage, and a relative afferent pupillary defect. Fundoscopy may reveal pulsatile or intermittent retinal arterial flow (8).

If retrobulbar hemorrhage is suspected, management may vary from medical to surgical. Medical management may include systemic steroids (dexamethasone 0.2mg/kg), intravenous mannitol 1 to 2g per kg, intravenous acetazolamide 10 to 15mg/kg, or topical beta-adrenergic blockers. In the event of a relative afferent pupillary defect, persistently elevated IOPs, vision changes, and an enlarging hematoma, emergent surgical decompression should be performed. (8) Surgical options include emergency canthotomy /cantholysis and orbitotomy. Chen et al demonstrated that medical management alone resulted in worse outcomes (improvement degree of 42%) while combined medical and surgical management had better outcomes (improvement degree of 82%) (9). Other studies have advocated the use of medical management as a way of 'buying time' as one awaits theatre.(10)

The patient in this case experienced a delay of approximately two weeks from the time she first had symptoms. This was occasioned by a lack of CT scan services at the referring facility and ended up being managed for what was thought to be orbital cellulitis. This delay may explain the poor vision outcome after orbital decompression was done. It is also unfortunate that, nonetheless, a coagulation profile was not done to rule out any coagulopathies, but the patient had had no bleeding tendencies prior to admission or during the follow up period.

This case differs slightly from some of the reported cases in literature. One such case is of a 31-year-old with spontaneous retrobulbar hemorrhage after a strong sneeze and vomiting. Her laboratory investigations, including complete blood count, coagulation profile were normal. She had reduced vision and a relative afferent pupillary defect and ended up being managed surgically(11). In our case, the patient denied any history of having an upper respiratory tract infection nor having had vomiting prior to the eye symptoms. In another event, the patient had a history of breast cancer and intake of tamoxifen where both are known to cause coagulation disorders.

Conclusion

Retrobulbar hemorrhage is a potentially blinding complication of mid-face trauma. Early detection is crucial followed by emergent decompression for cases with orbital compartment syndrome. The role of imaging in cases with proptosis should not be overlooked.

Ethical consideration

Patient particulars were not disclosed. The patient gave consent for the photographs to be taken and for publication of this case report.

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