

The Real Ophthalmologic Emergency: Orbital Compartment Syndrome and Its Management

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ABSTRACT

Retrobulbar haemorrhage can be related to blunt eye trauma which is a rare ophthalmic emergency situation. Orbital compartment syndrome (OCS) may be due to a traumatic excessive retrobulbar hemorrhage. Early diagnosis and immediate lateral canthotomy/cantholysis must be performed to save the vision of the affected eye. We wanted to present a patient with orbital compartment syndrome and its management in this case report.

Keywords: Blunt Eye Trauma, Cantholysis, Lateral Canthotomy, Orbital Compartment Syndrome, Retrobulbar Haemorrhage

Introduction

Ocular trauma can cause a retrobulbar hemorrhage, that can induce to irreversible vision loss, if not managed as soon as possible (1). The orbit is an enclosed space with limited elasticity to extend. Because of the limited capacity for expansion, raised volume because of retrobulbar bleeding results in increased pressure and OCS. It may cause permanent blindness rapidly by compressing the optic nerve and its vascular supply (2). A patient was presented with OCS and its management in this case report.

Case Report

A 45-year-old man was exposed to orbital blunt trauma. He presented with complaints of pain and loss of vision in the left eye. He explained that one hour prior, his left eye was impacted by a blunt glass bottle. Initial visual acuity was light perception in his effected eye. There was proptosis, severe periorbital edema, ecchymosis and skin laceration on the left lower eyelid (Figure 1a). Extraocular muscle movements in the left eye were limited in all directions. There was subconjunctival hemorrhage and chemosis in the left eye with biomicroscop (Figure 1b). There was no pupil light reflex. The pupil was fixed at 3 mm. The cornea and anterior chamber was normal. The optic nerve and retina were unremarkable.

Orbital decompression was carried out through lateral canthotomy and inferior cantholysis in the

emergency unit. The skin of the lateral eyelid was infiltrated with 1 mL of 1% lidocaine and 1:100.000 epinephrine. Next, a hemostat clamp was administered to the canthus for 60 s to compress and devascularize the skin (Figure 1c). An incision was performed with scissors to the canthus for canthotomy and extended 1 cm along its length to the inferolateral orbital rim. The inferior limb of the lateral canthal tendon was divided by scissors from the bony orbit in the second step. The scissors were lead inferiorly and laterally, and away from the globe (Figure 1d). Extra care was taken while directing the scissors laterally and superficially to prevent iatrogenic globe damage at this stage. Skin laceration on the left lower eyelid was sutured with 7.0 prolene suture (Figure 1d).

All blood tests including blood count, electrolytes and coagulation screen were within normal limits. Orbital computerized tomography (CT) was performed immediately after the surgical intervention. The inferior and medial orbital wall fracture, excess retrobulbar haemorrhage that moved the optic nerve superiorly were noted (Figure 2). The patient has history of uncontrolled diabetes mellitus. The blood glucose was 350 mg/dl. Insulin was started on the advice of endocrinologist. Systemic 4x250 mg prednisolon, 2cc per kg mannitol, sefazolin 3x1000 mg intravenously and asetozalamid 3x250 mg tb orally treatment was initiated for elevated intraocular pressure due to a retrobulber hemorrhage, proptosis and severe periorbital edema.

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Fig. 1a, 1b. Clinical photograph of the patient with OCS after blunt trauma who had left proptosis, severe periorbital edema, ecchymosis, conjunctival chemosis and dilated pupil. There was also a skin laceration on the left lower eyelid. **1c.** A hemostat clasp is placed across the canthus to compress and devascularize the skin. **1d.** Scissors are used to make an approximately 1 cm horizontal incision in the tissue. The incision should extend to the rim of the bony orbit. **1e.** Conjunctival hemorrhage and chemosis started to recover after one day. Pupil diameter and light reflex returned to normal. The release of the lower eyelid is observed in the picture. **1f.** Periorbital edema and proptosis completely healed after one week

The patient's visual acuity increased to 0,05 the day after. Chemosis and conjunctival hemorrhage began recovery. Light reflex and pupil had returned to the norm (Figure 1e). The optic disc was pale in the temporal section. Ocular movements was normal nasally and temporally but was restricted to superior and inferior movement. A week later, visual acuity was 0,8. In all directions, ocular movements were normal and periorbital edema and proptosis was completely healed (Figure 1f). The patient's lower eyelid was repaired after ten days with lateral tarsal strip method.

Discussion

OCS is eventually a clinical diagnosis. Acute decreased vision can be the first complaint followed by painful periorbital edema or proptosis in most patients. These symptoms with in minutes which can extend to hours. Anamnesis of recent surgery, trauma, or bleeding disorder may be elicited. Other critical signs of OCS are afferent pupillary defect or fix dilated pupilla, elevated intraocular pressure, restricted ocular movements, tenderness and ecchymosis. "Tense lids" and



Fig. 2. Hyperdense retrobulbar haemorrhage that displaced the optic nerve superiorly was detected

"tight orbit" can be evidence of high orbital pressure (2).

A fast and accurate diagnosis is important for appropriate management. Diagnosis should be made clinically. The immediate treatment given reduces the risk of irreversible vision loss. Prior to imaging or other diagnostic testing, surgical intervention must be performed (3). It should be done by *emergency physician* in emergency department or anywhere feasible. The treatment seeks to lower intraorbital pressure and protect the optic nerve from damage (4). Rosdeutscher et al have noted that corticosteroids have a safe guard on traumatic optic neuropathy. They stabilize the cell membrane against ischemic injury to prevent the inflammation (5). Elevated intraocular pressure in the proptotic eye is a significant indicator concerning ischemic injury and requires acute surgical treatment. Medical treatment including high-dose systemic steroids, antibiotics and systemic antiglaucomatous agents should be considered in such cases.

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