CASE REPORT

Proptosis Presenting as a Delayed Sign of Frontal Extradural Haematoma

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SUMMARY
We report a case of a young man who presented with proptosis as a delayed manifestation of a frontal extradural haematoma (EDH) following a minor head injury. A computed tomography (CT) of the brain done 72 hours after trauma revealed a large extradural haematoma in the right anterior cranial fossa with orbital roof fracture and subperiosteal clot extension into the orbital cavity. Right frontal craniotomy with evacuation of haematoma was done and the proptosis completely resolved after surgery. The clinical course, possible mechanism and management of the patient are discussed.

KEY WORDS:
Proptosis, Extradural haematoma, Orbital subperiosteal extension

INTRODUCTION
Extradural haematoma (EDH) is a common intracranial pathology following motor vehicle accidents, comprising about 0.2-6% of all head injuries1. Most cases are detected early during a routine CT brain which is done within 24 hours after the injury. Patients usually present with signs of increased intracranial pressure with loss of consciousness after a lucid interval. However, the diagnosis of frontal EDH can be missed or delayed due to minimal neurological sign which would not require a CT brain during acute presentation. Proptosis is a rare presentation of frontal EDH unless it is associated with subperiosteal extension into the orbital cavity1,2. Delay in the treatment of this condition may lead to permanent blindness.

We report a rare case of frontal EDH associated with orbital subperiosteal extension presenting late with proptosis as the main clinical manifestation.

CASE REPORT
A 21 year old Malay man was involved in a motor-vehicle accident and sustained a small bruise over his right forehead after his head hit the road. He was asymptomatic until three days after the trauma when he started to have bulging of the right eye followed by double vision. He was admitted to a district hospital for further investigation. His Glasgow Coma Score (GCS) was full and higher mental function was normal.

Neurological examination revealed abnormalities confined to the right eye. He had a right periorbital haematoma with proptosis and complete ophthalmoplegia (Figure 1). His pupil size was 3mm in size and reacted normally to light. Right visual acuity was normal. There was no papilledema or orbital bruit. Examination of the other systems was unremarkable. A CT scan of the brain revealed a right orbital roof fracture with a large extradural haematoma in the frontal region measuring 5x4x3cm in diameter with a volume of 50 ml. The haematoma had extended subperiosteally into the orbital cavity through the fractured orbital roof causing significant compression of the eye ball and its extraocular muscles (Figure 2).

We performed an emergency right frontal craniotomy to evacuate the haematoma. The EDH in the right frontal region was evacuated completely. There was a comminuted fracture of the roof of the right orbit. The fractured segment...
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The mechanism of proptosis in patients with frontal EDH associated with orbital subperiosteal extension has been suggested to be due bleeding from the subgaleal vessels. In our case, the cause of proptosis was due to frontal trauma to the supraorbital region causing a ‘blow-in’ fracture of the orbital roof permitting blood to enter the orbital cavity. The fractured segment of the orbital roof had dissected the periorbita that created a potential cavity for blood to collect. Blood from the anterior cranial fossa entered the orbital cavity through the bony opening and further dissected the periorbita. As the haematoma got bigger, it pushed the eyeball anteriorly and out from the orbital cavity causing proptosis. The significant size of the haematoma compressed the extra-ocular muscles and the nerve surrounding it causing ophthalmoplegia and blindness.

The definitive treatment of patients with frontal EDH associated with orbital extension is surgery. In patients with signs of intracranial pressure or decreased visual acuity, surgical removal of the orbital haematoma is mandatory and should be done as soon as possible. The aim of surgery is to release the mass effect to the adjacent brain due to haematoma compression and to remove the intraorbital clot. A standard frontal craniotomy with or without orbitotomy is normally used to evacuate the haematoma which is located at the frontal region. Apart from complete haematoma removal and bleeding control, craniotomy also allows better visualization and repair of the fractured orbital roof. Through the opening of the orbital roof, the orbital haematoma can be removed. Fractures of more than 2cm in the orbital roof should be repaired to avoid complications which may occur later.

Some surgeons advocate percutaneous needle aspiration as an alternative for craniotomy which is less invasive but technically challenging. The disadvantages of this technique are re-bleeding and incomplete haematoma clearance. Some authors also advocate trial of conservative treatment, topical use of timolol maleate and acetazolamide. Since orbital subperiosteal compartment is an avascular space, haematomas in this region take a few weeks to resolve making conservative treatment less effective. Pope-Pegram LD et al in their review of 11 cases of orbital subperiosteal haematoma treated successfully reported that six patients underwent needle aspiration, four patients underwent surgical evacuation and one case spontaneously resolved after six months. Our patient made an excellent recovery following craniotomy which was done immediately after admission.

REFERENCES