



CASE REPORT

An unusual case of a penetrating wound of the orbit

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Ocular trauma is a major cause of monocular visual impairment and blindness throughout the world.¹ The pattern of trauma differs significantly between developed and developing countries.²⁻⁶ In the former, major causes of trauma include occupational related injuries, leisure and sport activities and traffic accidents. In developing countries the picture is rather different with a higher frequency of assault-related injuries (more commonly perforating eye injuries with a high incidence of lacerations to lids, cornea and sclera), and fewer injuries associated with sports and leisure activities. However common to both worlds are the predominance of males and the young, with the majority under 30 years of age and the serious socio-economic impact, that is loss of vision, earnings (job opportunities) and productivity, and increased cost to society because of increased healthcare spending.² South Africa has the highest per capita violence mortality rate worldwide (59.2/100.000 vs. 9.6/100 000 in the US).⁷ Although there is a dearth of epidemiological data related to ocular trauma in South Africa, several risk factors have been identified from studies looking at admissions to casualty and emergency departments throughout the country. Poverty, substance abuse and intoxication consistently emerge as significant risk factors for violence and accidents in general.^{8,9} Penetrating wounds to the orbit constitute 30-50% of all traumatic eye injuries.¹⁰ The orbital contents or globe, or both, may be severely damaged with resultant blindness in the affected eye. In this paper we report on an unusual case of pen-

etrating orbital injury in a young man who was assaulted with a knife, yet maintaining a surprisingly good visual outcome in spite of the knife's course through a myriad of vital structures.

A 25-year-old male was admitted to the ophthalmology department with a penetrating orbital stab wound. The man was assaulted earlier that day with a short bladed knife. There was no reported alteration of consciousness or vital signs before arrival. On presentation the man was fully conscious with a Glasgow Coma Scale score of 15. The knife was still positioned in the left orbit (Figure 1). The blade of the knife had perforated the superior temporal aspect of lateral orbital wall and was embedded in the orbit with only the handle visible. Neurological examination showed no focal deficits, and all vital signs were normal. Visual acuity was 6/7.5 in the right eye and 6/6 in the left. Pupil reactions of both eyes were normal. Assessment of the globe biomicroscopically was normal. The globe was intact, all extra ocular movements were full and there was no proptosis or enophthalmos. Visual field assessment by confrontation was full in either eye. Conventional radiographs (Figure 2) and computed tomography (CT) (Figure 3) demonstrated a knife blade entering the orbit in the superior temporal area of the lateral orbital wall penetrating trans-orbitally, directed inferiorly, with the tip of the knife embedded in the ethmoid sinus. No herniation of orbital fat or periorbital into the adjacent maxillary or ethmoid sinuses were noted. No intracra-



Figure 1. Photograph showing knife position, entering left orbit at superior temporal aspect.



Figure 2. Orbital and sinuses X-Ray showing extent of knife penetration into left orbit



Figure 3. CT, coronal view showing penetration of left orbit.

nial lesion was noted. Although the CT carried scatter, it helped in assessing the structure of the eyeball, ruling out extraocular muscle and optic nerve injury, and orbital haemorrhage. We did not resort to arteriography as there were no signs to suspect significant vascular injury.

The knife was removed by a maxillofacial team under general anesthesia, and the entry wound was sutured. No major bleeding or liquorrhoea was noted from the wound.

Penetrating orbital injury may cause serious sequelae since vital structures may be compromised. The orbit is shaped like a horizontal pyramid, so penetrating objects are directed towards the apex and usually pass through the superior orbital fissure and optic canal (these two structures allow direct communication intracranially).^{11, 12} Complications range from traumatic cranial neuropathies to severe penetrating, often fatal, intracranial cerebral injuries.¹³ Ocular complications include optic nerve damage with resultant severe visual loss, extra ocular muscle paralysis secondary to direct muscle trauma or nerve damage, proptosis and macular oedema.¹¹ Moreover, functionally crucial cerebral structures may be injured and bleeding may occur. Finally, given the orbit's close proximity to the paranasal sinuses, infection, in particular abscess formation, is a common antecedent from penetrating orbital injury. Even if intracranial penetration is ruled out, the presence of orbital haematomas, abscesses, optic nerve sheath haematomas and some foreign bodies (organic material, copper) are regarded as true emergencies.¹⁴

In light of the above, this case appears to be unusual since a potentially disastrous injury did not cause any clinically relevant damage, was not associated with a complicated course, did not lead to any functional short-term sequelae, and the visual acuity on presentation was remarkably good. The factor contributing to this very fortunate outcome is that the knife did, by great chance, not cut through or otherwise lead to destruction of functionally critical structures.

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