

Does high intraocular pressure exclude an open globe injury?

Aruna Dharmasena, Dong Young Park, Mandagere Vishwanath

Manchester Royal Eye Hospital, Manchester M13 9WH, United Kingdom

Correspondence to: Aruna Dharmasena. Manchester Royal Eye Hospital, Manchester M13 9WH, United Kingdom. aruna_dharmasena@hotmail.co.uk

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Dear Sir,

Ocular trauma is a topic of unresolved controversies and there are continuous controversial and debatable diagnostic and management strategies for open-globe injuries^[1]. Amongst many types of ocular trauma, the open globe injury is the most serious due to its very poor visual prognosis and young population of patients are mostly affected^[2]. The treatment outcome may be improved by prompt diagnosis, and immediate surgical repair performed to high standard^[3]. Amongst the other clinical signs the intraocular pressure (IOP) is found to be particularly reduced and conventionally this is considered as a very reliable indicator of occult globe ruptures where the diagnosis is not obvious. Werner *et al*^[4] recognised that a significantly reduced IOP in an injured eye as a good predictor of an open globe injury and Kylstra *et al*^[5] postulate that an IOP of 5 mm Hg or less as a strong clinical predictors of scleral rupture. In a retrospective case series of 40 eyes, Russell *et al*^[6] recommend that an IOP of less than 10 mm Hg is highly predictive of scleral rupture. Based on these recommendations it is likely that a patient presenting with intra-ocular injuries and raised IOP to be considered as not having an open globe injury and therefore, may not considered for prompt surgical exploration and repair. This may jeopardise optimum visual rehabilitation and may also increase the risk of sympathetic ophthalmia in the fellow eye. We present a case of large occult traumatic posterior scleral rupture associated with paradoxically high IOP and we recommend that every suspected open globe injury deserves an examination and exploration of the posterior sclera under general anaesthesia to prevent serious sequelae.

The following patient who suffered accidental blunt trauma to the eye found to have a very large occult scleral rupture in spite of a severely raised IOP.

A 73 years old male presented to our emergency eye department with a history of an accidental fall and blunt trauma to the face and the right eye approximately 24h prior to presentation. The left side of the face and the fellow eye were unaffected. He had a past medical history of atrial fibrillation, hypertension and mild learning difficulties. He was on warfarin for his atrial fibrillation and the INR at presentation was 2.7. Presenting visual acuity was 'perception of light' in the affected right eye. The visual acuity in the fellow left eye was LogMAR 1.0 and there were evidence of age related macular degeneration in that eye. He had a right periorbital bruise but there was no bony tenderness. His right globe was tense and there was right proptosis of 2 mm. There was a large subconjunctival haemorrhage with two conjunctival lacerations at 3 and 9 o'clock positions. He had a large clotted hyphaema obscuring an oval shaped pupil and anterior chamber was shallow. IOP was severely raised in the affected eye at 58 mm Hg and 14 mm Hg in left eye. The details of the anterior chamber of the eye, lens and fundus could not be visualised due to hyphaema. Since there was no obvious evidence of penetrating eye injury or a globe rupture, a B scan ultrasound was performed and this showed a large suprachoroidal haemorrhage with choroidal effusion and kissing choroids. However, due to the shallow anterior chamber, anterior chamber hyphaema and the relative afferent papillary defect; it was decided to explore the posterior sclera and to examine the right eye under general anaesthesia. this study has been conducted in compliance with the required ethical requirements and the Declaration of Helsinki. An informed consent was taken and he was taken into the operating theatre immediately. Examination under anaesthesia confirmed the shallow anterior chamber with hyphaema. Conjunctival peritomy was performed and the extraocular muscles isolated and posterior sclera was examined carefully. A large scleral rupture extending from 9 o'clock to 1 o'clock position behind insertion of superior and lateral rectus muscles was discovered (Figure 1). A large clotted vitreous haemorrhage, prolapsed retinal tissue and a choroidal damage was evident. The superior rectus muscle was carefully detached from the insertion. The scleral wound was approximated with interrupted 8/0 ethilon sutures.

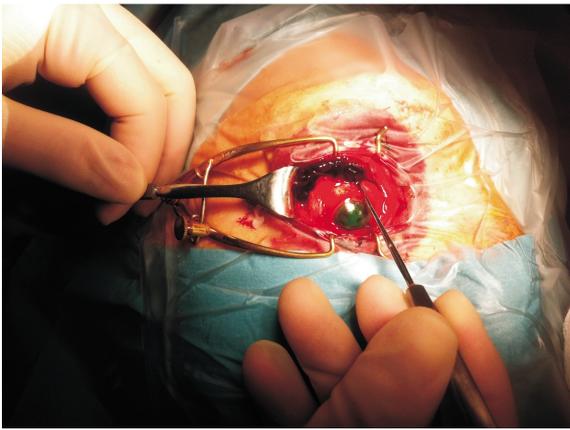


Figure 1 A large scleral rupture extending from 9 o'clock to 1 o'clock position behind insertion of superior and lateral rectus muscles in the right eye.

Superior rectus muscle was re-attached. Conjunctival lacerations and the surgical incision were closed using 7/0 vicryl sutures. Subconjunctival cefuroxime and dexamethasone were given intra-operatively. Unfortunately during the 1d post-operative assessment he found to have a total retinal detachment, severe hypotony with no perception of light and taking the patient's wishes into consideration it was decided to eviscerate his right eye.

Feng *et al*^[7] identified 7 prognostic predictors for 'no light perception' cases after open-globe injury namely; ruptured globe, open globe III, scleral wound size ≥ 10 mm, ciliary body damage, severe intraocular hemorrhage, closed funnel retinal detachment or retinal prolapse and choroidal damage. In the above patient suffered six out of seven of these features which explain the extremely poor prognosis in this case. Open globe injuries should theoretically result in a low IOP which is considered to be a reliable sign in confirming/excluding this sight threatening injury clinically. Although B-scan ultrasound scan is a useful investigation^[8], even in expert hands posterior scleral rupture can easily be

missed. In the above patient the IOP was severely raised and the B-scan ultrasound scan was inconclusive. There was no history suggestive of any other cause of raised IOP. There was no visible corneal, conjunctival or scleral laceration and the IOP was raised at 58 mm Hg giving the false impression that there is no open globe injury. We postulate that the presence of a co-existing large orbital haemorrhage and raised intra orbital pressure may have been responsible for the raised IOP noticed in this case and the high or normal IOP may be an unreliable indicator in excluding an open globe injury whilst significantly low IOP is highly suggestive of such an injury.

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