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SHORT COMMUNICATION

Posterior capsule rupture following closed globe injury: Scheimpflug imaging, pathogenesis, and management

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PURPOSE. *To report the Scheimpflug and clinical findings in a case of pediatric posterior capsule rupture due to blunt ocular trauma.*
METHODS. *Interventional case report. Analysis of Scheimpflug findings and review of literature.*
RESULTS. *An 11-year-old boy presented 2 days after blunt trauma to the left eye with a slingshot. On examination his best-corrected visual acuity (BCVA) was 20/20 in the right eye and 20/400 in the left. Slitlamp examination (left eye) revealed a Vossius ring, traumatic cataract, and traumatic posterior capsular rupture (TPCR).The contour of the posterior bulge corresponded to the edges of the TPCR. Scheimpflug imaging (Pentacam 70700: Oculus, Wetzlar, Germany) confirmed traumatic cataract in region of TPCR evidenced by increased lens density at cortex-vitreous interface, absence of vitreous prolapse into the anterior chamber, and the amount of residual nucleus. The extent of the TPCR in the greatest and least dimensions was documented before and after intraocular lens (IOL) implantation. Intraoperatively, TPCR was evident and phacoemulsification with IOL implant was performed. Postoperatively, his BCVA improved to 20/20 in the left eye with a well-centered in-the-bag IOL as found on slit lamp and Scheimpflug images.*
CONCLUSIONS. *This report highlights the use of Scheimpflug imaging in isolated posterior capsule rupture following closed globe injury, to visualize and quantify the size of posterior capsule rupture and its role in management. (Eur J Ophthalmol 2008; 18: 453-5)*

KEY WORDS. *Closed globe injury, Posterior capsule rupture, Posterior lenticonus, Scheimpflug imaging*

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INTRODUCTION

Posterior capsule rupture and cataract formation are known to occur following nonpenetrating ocular injury (1). An accurate assessment of the rupture is essential for the management of these cases. We report a case of isolated posterior capsule rupture following closed globe injury and highlight the use of Scheimpflug imaging, for the first time to our knowledge, to visualize and quantify the size of posterior capsule rupture.

Case report

An 11-year-old boy presented 2 days after blunt trauma to the left eye with a slingshot. On examination his best-corrected visual acuity (BCVA) was 20/20 in the right eye (OD) and 20/400 in the left eye (OS). Slit lamp biomicroscopy (OS) revealed a Vossius ring (Fig. 1, left) traumatic cataract, traumatic posterior capsular rupture (TPCR) with bulging out of lens cortex (Fig. 1, right). Gonioscopy revealed a 360° angle recession. It was a closed

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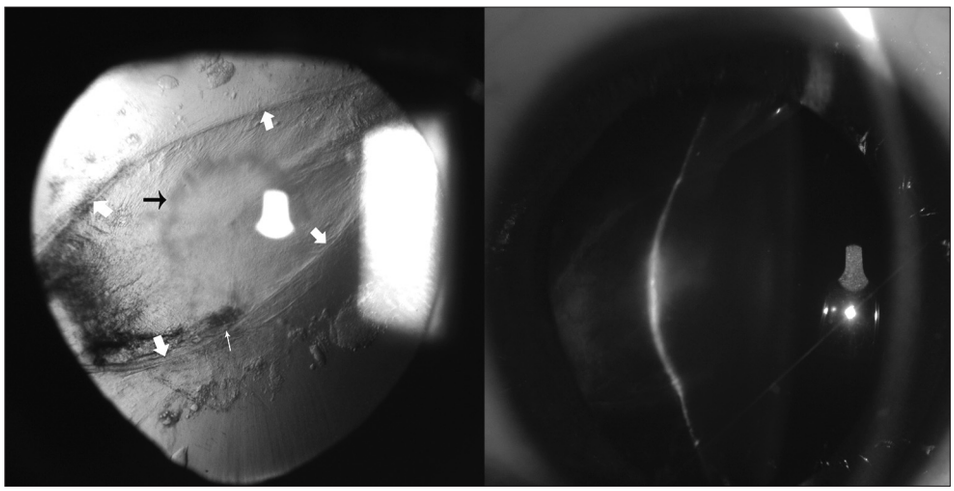

Fig. 1 - *Slit lamp photographs. Slit lamp examination of the left eye revealed a Vossius ring (black arrow), traumatic cataract, traumatic posterior capsular rupture (TPCR) (thick white arrows) with a bulging out of lens cortex corresponding to edges of TPCR, a streak of blood at its lower edge (thin white arrow).*

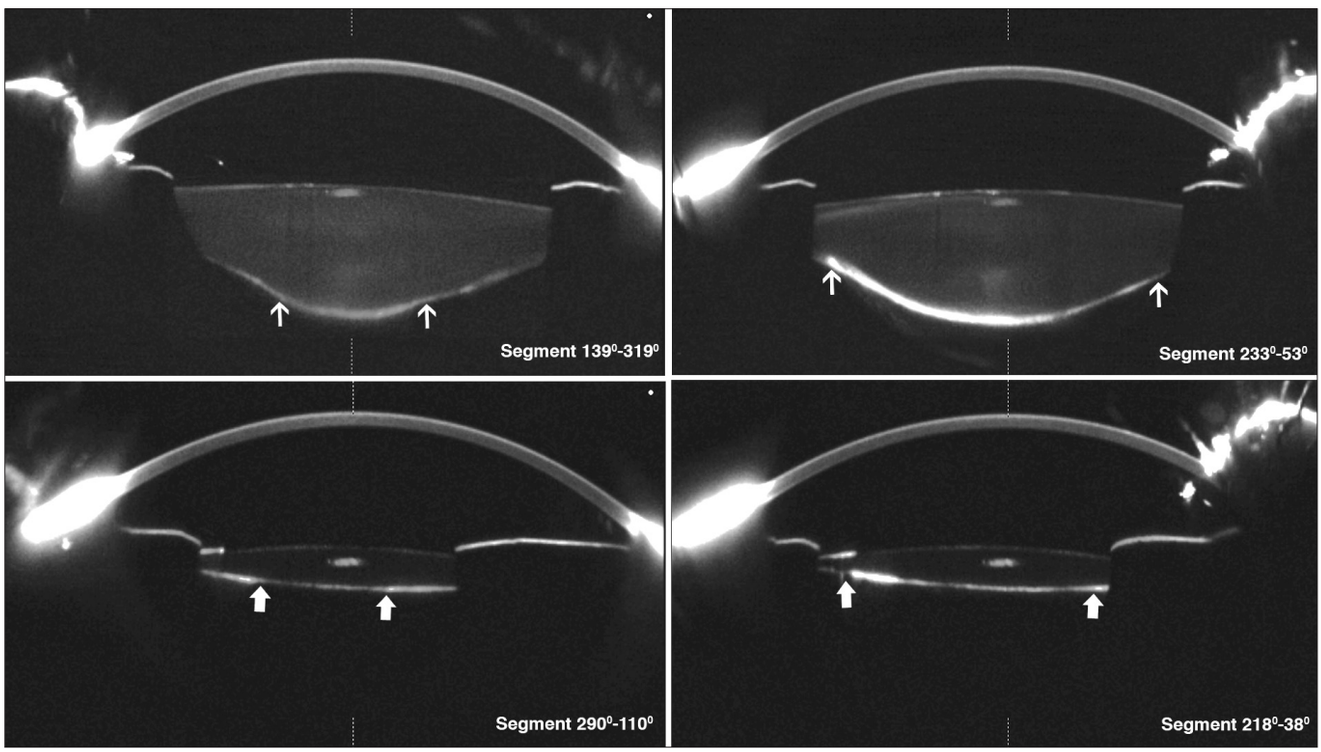

Fig. 2 - *Pentacam Scheimpflug images.* Top: *Preoperative, bottom: postoperative.* Top left: *Posterior pseudo-lenticonus (lens matter bulging through the rupture in the posterior capsule) and increased density of edges of posterior capsule surrounding the traumatic posterior capsular rupture (TPCR) (shortest axis).* Top right: *Increased density along the longest axis of the TPCR. The size of the posterior capsule opening, as measured on the Scheimpflug images, was 5920 µm x 3880 µm before surgery. Bottom left: Well-centered intraocular lens postsurgery and increased density along the short axis of TPCR. Bottom right: Increased density along the long axis of TPCR. Postoperative Scheimpflug images revealed a posterior capsule opening measuring 4840 µm x 3970 µm.*

globe injury, Type B, Grade 3, Zone 3 RAPD negative. Contour of posterior lenticular bulge corresponded to edges of the TPCR. Scheimpflug imaging (Pentacam 70700: Oculus, Wetzlar, Germany) was performed. Traumatic cataract in region of TPCR was evidenced by increased lens density at cortex-vitreous interface (Fig. 2,

top). Extent of TPCR in the greatest and least dimensions was documented before and after intraocular lens (IOL) implantation. Intraoperatively, TPCR was evident and hydrodissection was not performed. Phacoaspiration of the central core followed by cleaning of the cortex with the IA handpiece was carried out. The vitreous face was intact and condensed and did not prolapse into capsular bag. Edges of TPCR were clearly visible and were fibrosed, preventing capsular bag fixation of IOL. Postoperatively, BCVA improved to 20/20 (OS) and IOL was well-centered, in-the-bag, on slit lamp and Scheimpflug images (Fig. 2, bottom).

DISCUSSION

TPCR and cataract formation have been described after a nonpenetrating ocular injury (1, 2) and isolated TPCR is also a well recognized clinical entity (3-7). Lens fibers get progressively hydrated after development of TPCR resulting in cataract formation. TPCR breaks develop thick, fibrous margins about 6 weeks after trauma (4) which prevent it from enlarging during surgery, thus permitting conventional cataract surgery, and is a well established plan of management (7). When TPCR occurs, the extent of rupture, amount of residual nucleus and cortex, and presence or absence of vitreous prolapse into the anterior-chamber are all variable factors (5) which can be documented with Scheimpflug imaging. Recently, Por et al (6) suggested that blunt trauma induced TPCR in children occurred due to a combination of two forces: equatorial stretching pulling on the zonules and stretching the capsule centrifugally with the anteroposterior force pushing it back thereby increasing the probability of the capsule giving way especially in young children where the lens matter is soft and the zonules are strong. The lens capsule is thinnest in the central posterior region which is the commonest site of rupture. Saber et al (7) demonstrated that a force greater than 200 mm Hg is required to cause TPCR. This is not uncommon during direct impact by small, high velocity projectiles, as in this case. The vitreous face maintains its integrity and lens matter bulging through this rupture in the capsule gives an erroneous clinical profile of posterior lenticonus, for which we suggest a term: posterior pseudo-lenticonus. This report highlights the use of Scheimpflug imaging in visualizing and quantifying TPCR and its role in helping the surgeon better plan the surgery in these difficult cases.

None of the authors has any proprietary or financial interest in this report.

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