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CASE SERIES

Retinal folds and retinoschisis in accidental and non-accidental head injury

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Abstract

Aims To report the similarity of retinal findings in an infant who sustained an accidental head injury and an infant with non-accidental head trauma.

Methods Two male infants sustained head injuries with skull fractures. Case 1 was an accidental head injury and case 2 was a non-accidental head injury.

Results On examination, in case 1, there were four superficial retinal haemorrhages in the right fundus. The left eye had a haemorrhagic optic disc oedema with extensive retinal haemorrhages, retinal folds, and schitic cavities within the retina at the posterior pole. In case 2, the right fundus had a single blot haemorrhage at the posterior pole. The left fundus revealed optic disc haemorrhage and oedema with extensive retinal haemorrhages. There was a haemorrhagic retinoschisis with a retinal fold. Conclusions The two cases, one with accidental and the other with non-accidental injury, demonstrate very similar ophthalmic findings. This supports the argument that there may be no retinal signs seen exclusively in non-accidental head injury.

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Introduction

Retinal haemorrhages occur in 77–85% of children who sustain a non-accidental head injury. The retinal haemorrhages suggestive of abusive injury are multiple, situated at various depths of the retina and extending from the optic nerve to the ora serrata. It is a widely held

view that retinal folds and traumatic retinoschisis are seen in no other condition except shaken baby syndrome.^{4–7} Recently published case reports suggest that both retinal folds and retinoschisis can be associated with predominantly static crush head injuries.^{8,9}

This paper reports the similarity of retinal findings in two infants, one with accidental and the other with non-accidental head injury.

Case reports

Case 1

A 10-week-old male infant was born after 10 years of marriage and two previous failed attempts of assisted conception. The accident, witnessed by bystanders, involved the mother tripping and falling while carrying the infant in a papoose (front holding). The infant's head was crushed between the mother's chest and a wooden barrier.

A CT scan revealed a large frontal fracture with sudural, subarachnoid, intraparenchymal, and intraventricular haemorrhages. He had a normal coagulation profile. On dilation of his pupils, the right eye showed five small nerve fibre layer haemorrhages in the posterior pole (Figure 1a). The left eye had numerous retinal haemorrhages of differing size and morphology at various levels of the retina, extending from the optic disc to the ora serata. There were a number of elevated areas in the posterior pole with haemorrhages (retinoschisis) and retinal folds (Figure 1b).

A multidisciplinary team assessment suggested severe neurotrauma due to a crush injury.

Case 2

This 14-week-old female who was on the child protection register was admitted to the PICU

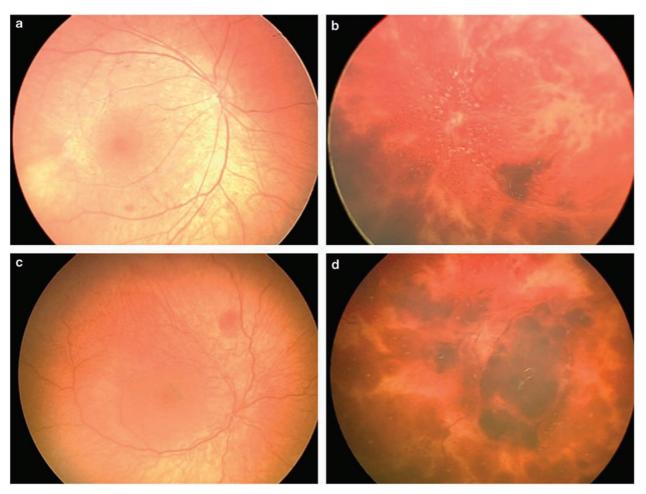


Figure 1 (a) Case 1—right eye with five small nerve fibre layer haemorrhages in the posterior pole. (b) Case 1—left eye with retinal haemorrhages present in all zones of the retina and extending to the ora serata. There were a number of elevated areas in the posterior pole with haemorrhage (retinoschisis) and retinal folds. (c) Case 2—right fundus with a single one disc diameter haemorrhage superior to the optic nerve. (d) Case 2—left eye fundus with multiple retinal haemorrhages and a blood-filled elevated area in the left macula (retinoschisis) with a neighbouring fold.

after a respiratory arrest. There was no history to suggest that the child was unwell. The CT scan showed a parietal fracture with cerebral oedema and loss of grey-white matter differentiation especially in the occipital cortex.

On examination, the pupils were dilated and fixed. The anterior segment was normal. The right fundus showed a single one disc diameter haemorrhage superior to the optic nerve (Figure 1c). The left eye fundus showed multiple retinal haemorrhages of differing size at various levels and extending from the optic disc to the ora serata. There were some pale centred haemorrhages and a large blood-filled elevated area in the left macula (retinoschisis) with a neighbouring fold (Figure 1d).

Comment

Following two recent reports^{8,9} in which retinal haemorrhages, perimacular retinal folds, and

retinoschisis were seen in the setting of a crush injury, a more recent retrospective case series 10 suggests that retinal haemorrhages are rare and retinal folds and retinoschisis were not seen. The mean age of the children in the latter report was considerably older (48.8 months) than the aforementioned case reports (4 and 14 months). It is possible that this conflicting evidence may be reconciled by the differing age of the children involved, the forces and mechanism and the static and dynamic forces sustained during the injury.

This report supports the argument that similar ophthalmic findings may occur in crush injury and non-accidental head injury. In the setting of retinal haemorrhages as described in these cases (with or without retinal folds and retinoschisis), with intracranial injury it is imperative that each case is assessed carefully to rule out inflicted injury. This should include a careful history taken by various health professionals from all



possible sources to check for consistency, investigations to rule out coexisting morbidity (skeletal survey, coagulation studies), and a multidisciplinary assessment.

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