G82 Extensive Hemorrhagic Retinopathy, Perimacular Retinal Fold, Retinoschisis, and Retinal Hemorrhage Progression Associated With a Fatal Spontaneous, Non-Traumatic, Intracranial Hemorrhage in an Infant

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After attending this presentation, attendees will learn that severe hemorrhagic retinopathy, perimacular retinal folds, and retinoschisis can occur from a fatal spontaneous, non-traumatic, intracranial hemorrhage in an infant. Attendees will also learn that retinal hemorrhages can progress in an infant during the course of hospitalization.

This presentation will impact the forensic science community by increasing the attendees' awareness of conditions in infants associated with severe hemorrhagic retinopathy, perimacular folds, retinoschisis, and retinal hemorrhage progression.

A number of studies continue to claim that Abusive Head Trauma (AHT) can be diagnosed with confidence when extensive Retinal Hemorrhages (RHs) accompanied by perimacular folds and retinoschisis are found in association with an intracranial hemorrhage in an infant. The only exceptions noted to date are crushed head injuries, or traumatic brain injuries associated with motor vehicular collisions. Natural disease processes causing intracranial hemorrhage have not been previously associated with severe hemorrhagic retinopathy, perimacular folds, and retinoschisis. Advanced as the explanation for the hemorrhagic retinopathy associated with AHT or Shaken Baby Syndrome, the vitreo-retinal traction theory assumes the RHs coincide with the intracranial injury and do not progress during hospitalization. A case of an infant with a fatal, spontaneous, non-traumatic intracranial hemorrhage associated with severe hemorrhagic retinopathy, retinoschisis, a perimacular fold, and RH progression was reported.

Case Report: A 2-month-old infant awoke from a nap fussy. Her mother changed her diaper and began preparing a bottle. Her father placed the infant over his shoulder and attempted to soothe her. A few minutes later he and the infant's aunt noticed that she was unresponsive. The paternal grandmother began cardiopulmonary resuscitation and on arrival of emergency medical services, the baby was apneic but had a palpable pulse. On presentation to the emergency department, she was hypotensive and started on a dopamine infusion. A cranial computed tomography scan demonstrated a large basilar subarachnoid hemorrhage occupying the supra-sellar cistern considered secondary to an aneurysm, arteriovenous malformation, or tumor. Blood was within the cerebral ventricles but because of the diffuse nature of the hemorrhage, the pediatric neuroradiologist could not rule out the possibility of non-accidental trauma. She was admitted to the pediatric intensive care unit and an osseous survey initially was interpreted as no evidence of acute or healing fractures, or other evidence of non-accidental trauma; however, on review of the skeletal survey remote healing/remodeling fractures involved the anterior left seventh and eighth ribs near the costochondral junction. A clinical examination consistent with brain death was confirmed by a negative cerebral blood flow study. Subsequently, an ophthalmology consultation with RetCam™ photo-documentation disclosed extensive multilayered RHs and a perimacular fold on the left, but no hemorrhages within the right fundus.

She had no external injuries and her autopsy was significant for severe cranial sutural diastasis, a large basilar subarachnoid hemorrhage, intraventricular hemorrhage, a right subdural hematoma, and severe anoxic ischemic brain injury, and cerebral edema. The spontaneous intracranial hemorrhage arose from an arteriovenous malformation of the choroid plexus adjacent to the hippocampus and inferior horn of the right lateral ventricle. Besides bilateral optic nerve sheath hemorrhages, she had diffuse multilayered RHs carpeting the left fundus to the ora serrata. A large premacular hemorrhagic cyst and perimacular fold with retinoschisis was present on the left, as well as vitreous hemorrhage. Although no RHs involved the right fundus during the first 21 hrs of hospitalization, she had subsequently developed multiple RHs over the right posterior pole while in the intensive care unit following a clinical brain death examination and negative cerebral blood flow study. Histologically, the healing fractures of the left ribs appeared at least four to six weeks of age.

This case describes severe hemorrhagic retinopathy with a perimacular fold and retinoschisis associated with a fatal spontaneous, non-traumatic, intracranial hemorrhage arising from an arteriovenous malformation of the choroid plexus. Also of significance, this infant had no RHs documented by a clinical ophthalmology examination and RetCam™ imaging while in the pediatric intensive care unit, but subsequently developed multiple multilayered RHs over the right posterior pole extending past the equator.

Although many authors consider that severe hemorrhagic retinopathy, retinoschisis, and perimacular folds are virtually pathognomonic of abusive head trauma, this case highlights the need for caution in attributing these ocular findings as diagnostically specific for AHT. This case also emphasizes that RH progression can occur in infants during hospitalization.

Retinal Hemorrhage, Retinal Fold, Child Abuse

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