H48 Do the Eyes Have It? Traumatically Induced Primary Optic Nerve Sheath Hemorrhage

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After attending this presentation, attendees will understand the possibility of the generation of optic nerve sheath hemorrhage without neck fracture, skull fracture, brain hemorrhage, or confluence with subdural hemorrhage.

This presentation will impact the forensic science community by demonstrating direct traumatic origin of optic nerve sheath hemorrhage without concomitant findings proposed by part of the forensic community as a prerequisite to the generation of such hemorrhage.

This presentation is based on a case study that provides essentially an experiment of nature. A 2-month-old infant was found unresponsive at his residence while under the sole care of his father. Death was pronounced at the scene without significant resuscitative efforts.

The infant presented postmortem without brain swelling and with soft fontanelles, but had optic nerve sheath hemorrhages and retinal hemorrhages as part of the anatomic findings. The calvarial plates were without fracture while dorsal calvarial sutures had soft tissue hemorrhage following the suture lines. There was right parietal subdural hematoma but no subdural hemorrhage contiguous with the optic nerves. There was subarachnoid blood staining but not in the proximal intracranial optic nerve sheaths. There was subdural blood about the cervical spinal cord but the neck on posterior dissection was without fracture.

An interview of the child's immediate caretaker first resulted in denial of knowledge about the origin of injury. Later, the caretaker admitted to an accidental drop of the child from shoulder height to the floor with intermediate impact of the child's head on a kitchen countertop two days prior to demise. The child was then less active than usual until found unresponsive on the day of death. The caretaker consented to further interrogation, including polygraph. He appeared truthful except upon questioning about shaking the child. When presented with the polygraphic findings, he then admitted to and described shaking the child vigorously when, after the fall, the child appeared in distress and he wanted to alleviate the symptoms to avoid discovery of injuries possibly incurred at the time of the fall.

This case does not solve the debate about impact versus shaking as the source of optic nerve sheath hemorrhages and retinal hemorrhages nor does it solve the issue of working backward from injury presentation to etiology of injury. The case does demonstrate that the optic nerve and retinal findings long considered associated with abusive child injury can, in fact, be the direct consequence of trauma. The finding of optic nerve sheath hemorrhage is not necessarily a secondary phenomenon related to resuscitation or the secondary effects of elevated intracranial pressure, but may be a primary finding.

Optic, Nerve, Hemorrhage