



## Pathology/Biology Section - 2015

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### H43 Rebleeding Into Subdural Neomembranes and the Myth of “Two in a Row” in Childhood

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After attending this presentation, attendees will gain an understanding of subdural neomembranes, their rebleeding tendency, and their relevance in unexplained deaths in childhood.

This presentation will impact the forensic science community by enhancing the knowledge of subdural neomembrane pathophysiology and providing an evidence-based assessment of the practical realities surrounding neomembranes in children, including the likelihood that the “two in a row” theory, or two accidental sublethal injuries, might explain a catastrophic neurologic event.

Whether small subdural collections or subdural neomembranes may predispose to rebleeding after minor head trauma is a point of debate in the criminal defense world.<sup>1</sup> Complicating the issue is the fact that chronic subdural collections by themselves in children have a significant likelihood of being caused by abuse, while rebleeding into chronic subdural collections is common in older age groups and may be encountered with trivial, or unrecognized, head injury. In effect, a traumatic lesion that is often non-accidental in children is used somewhat ironically as a means to lessen the culpability of potentially the same perpetrator who later inflicted an acute process that lead to catastrophic neurological collapse.

This issue is illustrated by the case of a 3-month-old boy who presented to the emergency department in a coma after falling off a couch onto a carpeted floor, per the father’s account. After initiation of resuscitative efforts, evaluation revealed acute subdural, subarachnoid, and intraventricular hemorrhages, bilateral retinal hemorrhages, and a healing right 11th rib fracture. The child was the product of a twin gestation; the twin was also found to have healing fractures. Despite resuscitative efforts, the infant continued to decline and expired after being declared brain dead. Autopsy examination revealed bilateral subdural and subarachnoid hemorrhages, bilateral retinal hemorrhages, a healing 11th rib fracture, diffuse cerebral edema with transient global ischemic necrosis, and a subdural neomembrane involving the falx cerebri. Minimal acute blood was associated with the neomembrane.

In this case, the accident as reported by the father was vigorously defended on the basis of the neomembrane, in effect indicating that the neomembrane facilitated the neurologic decline with trivial head trauma, consistent with a fall off a couch onto a carpeted surface.

In addition to this illustrative case, the pathophysiology of subdural neomembrane, subdural rebleeding, and accidental as well as non-accidental blunt trauma in children is reviewed, along with a review of the pediatric literature on acute and chronic subdural hemorrhage.

In conclusion, only rare cases of subdural neomembrane rebleeding are recorded in the literature, and no prospective data are available. Moreover, no cases of acute neurologic collapse due to rebleeding into a neomembrane have been described to date, suggesting that the “two in a row” theory does not occur in humans, as is often suggested at trial.

#### Reference:

1. Hymel KP, Jenny C, Block RW. Intracranial hemorrhage and rebleeding in suspected victims of abusive head trauma: Addressing the forensic controversies. *Child Maltreatment* 2002;7(4):329-348

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#### Subdural Neomembrane, Rebleeding, Child Abuse