H101 A Fatal Ruptured Saccular Middle Cerebral Artery Aneurysm in a 14-Year-Old Boy: A Case Report

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Learning Overview: After attending this presentation, attendees will have an increased awareness of the characteristics and etiology of pediatric saccular aneurysms.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing features of a rare cause of intracranial bleeding in a pediatric patient.

Intracranial aneurysms rarely occur in patients less than 18 years of age and only represent 0.5% to 4.6% of intracranial aneurysms.[1] As a result, pediatric aneurysms are poorly understood compared to their adult counterparts. In adults, risk factors are associated with the development of intracranial aneurysms, such as smoking, hypertension, diabetes, high fat and cholesterol diets, obesity, and excessive chronic alcohol intake. However, these are generally not yet present in children. Trauma and infections are the biggest contributors to pediatric aneurysm formation. Additional contributors include: gene mutations interfering with the extracellular matrix; connective tissue diseases, including Marfan`s syndrome; coarctation of the aorta; Ehler-Danlos syndrome; fibromuscular dysplasia; and polycystic kidney disease.[2] This report seeks to add to the limited literature on this subject.

This is the case of a 14-year-old male who was found unresponsive in his bed the morning after an uneventful night. He was previously well and had no familial history, history of traumas or drug use. He had recently started exercising and swimming. He was pronounced dead at the hospital emergency department that day.

Postmortem non-contrast Computed Tomography (CT) was conducted that revealed a Subarachnoid Hemorrhage (SAH), which prompted further investigation. A postmortem CT angiogram was performed that showed a ruptured berry aneurysm and an SAH, also seen on pre-angiography Magnetic Resonance Imaging (MRI). Post angiography MRI confirmed the ruptured saccular aneurysm and SAH. On autopsy examination, the aneurysm was measured at 0.8mm in the widest dimension and was located at the bifurcation of the right Middle Cerebral Artery (MCA) and the right ophthalmic artery.

Microscopic examination of the vessel dilatation confirmed a saccular aneurysm of the right MCA with disruption of the elastic lamina. There was no evidence of significant atherosclerosis or inflammatory infiltrates. Toxicology of postmortem blood was negative for ethanol. Genetic analysis for aortopathy and Ehlers-Danlos was negative.

This case is an example of a ruptured non-traumatic, non-infectious saccular aneurysm with no known predisposing factors. The literature states that roughly 30% of aneurysms in children are idiopathic.[3] More research is needed to determine the etiologies of these presentations in order to diagnose them before they rupture, although this is difficult due to their rarity. This case contributes to the literature by demonstrating a thorough postmortem investigation including CT angiography, MRI, autopsy examination, and ancillary testing in a pediatric ruptured saccular aneurysm.

Reference(s):

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2. Sorteberg, Angelika, and Daniel Dahlberg. Intracranial Non-Traumatic Aneurysms in Children and Adolescents. *Current Pediatric Reviews* 9, no. 4 (2013): 343–52. https://doi.org/10.2174/221155281120100005.
3. Krings, Timo, Sasikhan Geibprasert, and Karel G TerBrugge. Pathomechanisms and Treatment of Pediatric Aneurysms. *Child's Nervous System* 26, no. 10 (2010): 1309–18.

Saccular Aneurysm, Subarachnoid Hemorrhage, Pediatric

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