G2 Acute Respiratory Insufficiency During Computed Tomography Procedure for Pituitary Adenoma

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After attending this presentation, attendees will understand that potentially fatal respiratory insufficiency can result from procedural sedation in patients with upper airway narrowing due to lymphoid hyperplasia.

This presentation will impact the forensic science community by demonstrating the relevance of autopsy examination to accurate certification in cases involving adverse events during medical therapy.

A case is presented of a 39-year-old man who underwent an outpatient CT scan for recent headaches. His past medical history included mental retardation due to a penicillin reaction during childhood. He also had recurrent viral infections and a seizure disorder which was previously treated with phenytoin. Currently, his seizures were controlled with oral levetiracetam (Keppra) 1,000mg twice daily, and 5mg diazepam, three times a day. Prior to his CT scan, he received 1,000mg IV levetiracetam over 15 minutes and 5mg of IV midazolam slowly; however, due to continued agitation in the scanner he was slowly given 75mcg of intravenous fentanyl. He was then administered IV contrast, but four to five minutes after contrast injection he appeared to have a "vagal" reaction which was treated with increased IV fluids. He did not respond, and full cardiopulmonary resuscitation was initiated. His mother informed caregivers of his "do not resuscitate" status; however, he had already regained spontaneous respiratory and cardiac activity. Unfortunately, he was found to have profound and irreversible hypoxic-ischemic encephalopathy, and he was discharged home to hospice care where he died the next day. The local Justice of the Peace declined to order an autopsy, and the family allowed the body to be embalmed; however, they later requested a private autopsy in hopes of obtaining a better understanding of the cause of death.

Autopsy Findings: The sella turcica was expanded by a friable and uniformly grey-tan, 2.0cm mass which compressed the adjacent optic chiasm. Microscopically, the normal pituitary histology was effaced by a monomorphic population of cells which were strongly positive for prolactin by immunohistochemistry. At the periphery of the tumor there was a compressed rim of normal pituitary tissue. Within the thalamus there were scattered red neurons. The upper airways were markedly narrowed at the laryngeal inlet by thickening and induration of the epiglottis and aryepiglottic folds. The epiglottis was also folded towards the midline, resulting in transverse airway narrowing to approximately 4 millimeters. Microscopically, the epiglottis contained prominent lymphoid infiltrates with germinal centers containing numerous tingible bodies. Plasma cells were also increased within the subepithelial tissues.

It is the opinion that this man died of anoxic encephalopathy due to multifactorial acute respiratory insufficiency during computed tomography for evaluation of headaches due to pituitary adenoma. The respiratory insufficiency was due to the combined effects of upper airway narrowing associated with lymphoid hyperplasia and respiratory depression associated with procedural sedation.

The effects of phenytoin on lymphoid tissues have been known for some time and airway compromise due to lingual tonsil hyperplasia causing laryngeal obstruction has also been previously associated with phenytoin therapy. In addition, treatment-emergent adverse events reported with levetiracetam therapy have included pharyngitis and this patient was also reported to have recurrent viral infections. Therefore, multiple factors may have contributed to laryngeal narrowing in this case. Furthermore, studies indicate that safe procedural sedation is best ensured by careful presedation risk assessment and monitoring during the procedure. It is the opinion that "accident" is an appropriate manner of death in this case, since death was not solely due to natural disease; however, others may certify such deaths as "natural" (based on predictable or foreseeable consequences of treatment for a medical disorder). The "death certification and manner-of-death classification require judgment, and room must be allowed for discretion on a case-by-case basis." In conclusion, this autopsy provided helpful clarification regarding the multiple complex and inter-related factors which were contributory to this man's death.

Lymphoid Hyperplasia, Procedural Sedation, Airway Compromise

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