



## H58 An Unusual In-Custody Death

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**Learning Overview:** After attending this presentation, attendees will have learned of an unusual death in jail and more considerations for the investigation of the “in-custody” death.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing a complicated case with the decedent’s psychological behaviors and secondary adrenal insufficiency that could have been the cause or result of one another.

In-custody deaths are invariably complex and high-profile cases. They require thorough investigation of the scene, including acquisition of any videos of the scene, the decedents’ behaviors prior to the death, eyewitness’ statements, and the circumstances surrounding the event. It is also important to get the decedents’ medical histories and perform complete autopsies with toxicologic studies.

The case of a 27-year-old White male found unresponsive in his jail cell is presented. His medical history was significant for bipolar disorder and borderline personality disorder. He also suffered from panhypopituitarism due to resection of his pituitary for a craniopharyngioma while still a child. He was being treated with desmopressin but had recently indicated that he was on a hunger strike, which included refusing water, food, and medications. Following transport to the hospital he was diagnosed with hypoglycemia, electrolyte insufficiencies, dehydration, and shock. He ultimately expired and an autopsy was requested. Autopsy findings included replacement of the pituitary gland by a 1.5cm greenish fluid-filled cyst. However, residual pituitary tissue was identified microscopically. The right adrenal gland was not identified, and the left adrenal gland was markedly atrophic (4.4 grams), as was the thyroid gland (10 grams). Other significant findings included bilateral pleural effusions (500ml on each side) and ascites (500ml).

Secondary adrenal insufficiency occurs when the pituitary gland fails to produce enough Adrenocorticotropic (ACTH), a hormone that stimulates the adrenal glands to produce the hormone cortisol.<sup>1</sup> If ACTH output is too low, cortisol production drops. Eventually, the adrenal glands can shrink due to a lack of ACTH stimulation. The etiology of secondary adrenal insufficiency may include stoppage of corticosteroid medication and surgical removal of pituitary tumors; other less common causes include tumors or infections of the pituitary gland, loss of blood flow to the pituitary gland, exposure of the pituitary gland to radiation, or the surgical removal of parts of the hypothalamus.<sup>2</sup> The slowly progressing symptoms of adrenal insufficiency can rapidly evolve into an adrenal crisis with any additional stresses.<sup>3</sup> The symptoms of adrenal crisis include dehydration, low blood pressure, loss of consciousness, and death. In the current presented case, it is suspected that adrenal crisis likely contributed to and/or was exacerbated by the grave consequences of the decedent’s hunger strike with resultant hypoglycemia, electrolyte insufficiencies, and dehydration.

### Reference(s):

1. Neary, N.; Mieman, L. Adrenal insufficiency: Etiology, diagnosis and treatment. *Current Opinion in Endocrinology, Diabetes and Obesity*. 2010 (3): 217-223.
2. Schmiegelow, M.; Feldt-Rasmussen, U; Rasmussen A.K.; et al. Assessment of the hypothalamo-pituitary-adrenal axis in patients treated with radiotherapy and chemotherapy for childhood brain tumor. *J Clin Endocrinol Metab* 2003; 88:3149.
3. Sun, T.; Liu, L.; Sunnassee, A.; Zhuo, L.; Zhu, S. Sudden death in custody due to pituitary apoplexy during long restriction in a sitting position: A case report and review of the literature. *J Forensic Leg Med*. 2013 Oct;20(7):812-5.

### Panhypopituitarism, Adrenal Crisis, In-Custody Death