



Pathology Biology Section – 2007

G92 Pituitary Macroadenoma Presenting as Hypothermia: A Case Report

Michelle A. Jorden, MD*, Adrienne Segovia, MD, and Edmund R. Donoghue, MD, Cook County Medical Examiner's Office, 2121 West Harrison Street, Chicago, IL 60647

The goal of this presentation is to present an uncommon cause of hypothermia due to a brain tumor and highlight the importance of central nervous system causes that affect body temperature regulation.

This presentation will impact the forensic community and/or humanity by demonstrating an unusual cause of hypothermia.

Hypothermia is diagnosed when an individual's body temperature is below 95°F (35°C). In forensic pathology practice, the most common cause of hypothermia is exposure to low temperatures without adequate warming measures. It is not uncommon for individuals to present to the emergency room having been exposed to extremely cold temperatures and then subsequently to die. In these cases in particular, forensic pathologists must rely on documentation of body temperature within the medical records to assess whether hypothermia may have caused or contributed to death. In cases in which hypothermia is a cause or contributing factor to death, the manner of death is rendered as an accident. The extreme ages of life, those encompassing the very old and young, are most vulnerable to hypothermia because of debilitating disease or lack of self-nurturing skills. The body responds to hypothermia by increased heat production through peripheral vasoconstriction and shivering. Shivering ceases between 85- 90°F and the loss of hypothalamic function to regulate temperature ceases below 85°F. Once compensatory measures fail to increase heat production, individuals can experience ventricular fibrillation and death.

Less commonly, and rarely documented in the literature, brain lesions can cause hypothermia.

A 59-year-old black woman who initially came to clinical attention in May 2006 after falling out of her wheelchair and hitting her head on a concrete floor in her room at a nursing home. She had a history of a brain tumor and was on warfarin for deep venous thrombosis. The subject was taken to the emergency room to obtain a brain CT scan, as mandated by the nursing home protocol. En route to the hospital, the patient became hypotensive and was cool to touch. In the emergency room the patient was hypothermic with a temperature of 29°C (84°F) and continued in a hypotensive state. A CT scan of the head was negative for hemorrhage. Once her blood pressure was stabilized with vasopressors, the patient's hospital course was complicated by administration of antibiotics for a presumptive diagnosis of sepsis and subsequent development of anaphylaxis. She was intubated after upper airway swelling and developed adult respiratory distress syndrome, which ultimately led to her demise two days later.

At autopsy, there was diffuse consolidation of all the lung lobes and microscopic examination revealed diffuse hyaline membranes without organization. There was minimal laryngeal swelling. The skull showed evidence of a prior craniotomy site and an organizing subdural hematoma. The sella turcica was markedly enlarged and contained a 2.3 X 1.8-cm pituitary macroadenoma containing a small area of hemorrhage. The macroadenoma grossly compressed and distorted the overlying hypothalamic area. Microscopic sections of the hypothalamic area revealed a symmetrical compressive infarct consisting of rarefaction of glial tissue, numerous axonal spheroids, and collections of parenchymal hemosiderin. The cause of death rendered in this case was hypothermia due to pituitary macroadenoma and the manner of death was rendered as natural.

This is an unusual case of a macroadenoma causing overlying compression of the hypothalamus. It is concluded that compression of the overlying hypothalamic area by the pituitary macroadenoma caused a disruption in the thermoregulatory function of the hypothalamus, thus causing hypothermia. The fall may have contributed to focal hemorrhage and enlargement of the pituitary macroadenoma with further compression of the hypothalamus and subsequent development of symptoms.

Hypothermia, Pituitary Macroadenoma, Death