



H113 Sudden and Unexpected Death During Sexual Activity Due to a Glial Cyst of the Pineal Gland

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This case emphasizes the need for an accurate extensive gross examination as well as a comprehensive brain specimen, to rule out neurological causes of sudden death. After attending this presentation, attendees will better understand pineal region cysts, in which a complete forensic investigation and comprehensive history is essential to ascertain the cause of death. Furthermore, forensic pathologists must take into consideration the physiological modifications induced by sexual activity, which are capable of eliciting fatal neurological events in predisposed patients.

This presentation will impact the forensic science community by demonstrating that a cystic lesion of the pineal gland region may in some instances cause sudden death by interfering with the functions of reticular formation of the brainstem, especially during sexual intercourse. In this case, the intracranial pressure increases, secondary to Valsalva's maneuver during climax which may further aggravate compression on the midbrain and brainstem. This presentation will address a case of sudden and unexpected death during sexual intercourse in a woman with an undiagnosed pineal gland cyst.

Case Report: A 45-year-old woman, in apparently good health, collapsed and died unexpectedly following cardiopulmonary arrest, after reaching orgasm while engaged in sexual intercourse. According to the circumstantial account of relatives, the woman suffered from severe headaches exacerbated by certain types of physical strain, such as sexual activity, although she reportedly had never undergone thorough neurological examination nor diagnostic neuroimaging.

Autopsy Findings: An autopsy was performed 24 hours after her death to ascertain the causes. The external examination was unremarkable and there were no injuries present on gross examination. Lividity was evident and fixed on the dependent regions of her back. No evidence of sexual assault was present.

On internal examination, the patency and elasticity of her coronary arteries appeared normal. The heart weighed 330g and both the myocardium and heart valves revealed no significant gross pathological findings. The brain weighed 1,360g. A cystic lesion of the pineal gland was observed in the midbrain, in close proximity to the quadrigeminal plate. The lesion measured approximately 15mm; however, the anatomy of the ventricular system appeared normal.

Microscopic Examination: Microscopically, the wall of the cyst consisted of a layer of glial tissue, surrounded by a zone of pineal elements. A proliferation of small-sized cells were identified immunohistochemically to be positive for synaptophysin, whereas Epithelial Membrane Antigen (EMA) and Cytokeratin AE1/AE3 were both negative. A focal area of Glial Fibrillary Acidic Protein (GFAP)-positive fibers, substantially devoid of mitotic activity as well as microcalcifications, was also found within the intralésional glial layer. Microscopic examination



of the remaining internal organ systems revealed no demonstrable abnormalities.

Discussion and Conclusion: A complete forensic examination corroborates the conclusions that the cause of death was fatal cardio-circulatory failure, resulting from midbrain compression due to a non-neoplastic pineal gland cyst, exacerbated by sexual activity.

The relevance of the case report for the forensic science community consists of demonstrating that a cystic lesion of the pineal gland region may rarely determine sudden death by interfering with the functions of reticular formation of the brainstem, especially during sexual intercourse. In this case, the intracranial pressure increase, secondary to Valsalva's maneuver during climax, may have further aggravated compression on the midbrain and brainstem, thus concurring to cause cardiac arrest.

Cystic lesions of the pineal region are typically found in a small percentage of adult patients. Although their mechanism of development and growth are unknown, they are generally benign, asymptomatic lesions that often go undiagnosed. To date, a mere three cases of fatal outcomes from the effects of a cyst of the pineal gland have been described in the literature. The underlying mechanism, whereby these lesions resulted in death is seldom clear and usually inferred. According to Milroy and Smith, in patients with a history of chronic headache, pituitary cysts should be considered the sole cause of death if there is no other gross or histological evidence of significant pathology.¹

This case demonstrates the importance of performing appropriate diagnostic tests in patients presenting with chronic headache exacerbated by physical activity and/or sexual intercourse. As regards the forensic perspective, the case emphasizes the need for an accurate and extensive gross examination, including brain specimens, to rule out neurological causes of sudden death.

Upon completing this presentation, attendees will have gained knowledge of pineal region cysts, in which a complete forensic investigation and comprehensive circumstantial history, is essential to ascertain the cause of death. Furthermore, forensic pathologists must take into consideration the physiological modifications induced by sexual activity, which are capable of eliciting fatal neurological events in predisposed patients.

Reference(s):

1. Milroy C.M., Smith C.L. Sudden death due to a glial cyst of the pineal gland. *J Clin Pathol* 1996;49(3): 267-9.

Pineal Gland Cyst, Sexual Activity, Sudden Death