H141 A Rare Case of Fatal Retropharyngeal Hemorrhage in a Patient With Neurofibromatosis Type 1 (NF1)

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After attending this presentation, attendees will be aware that: (1) vascular complications are the most common cause of death after malignancy in patients with NF1; (2) rupture of cervical vessels invaded by neural fibers may result in a large retropharyngeal hematoma and may cause death by acute airway obstruction; and, (3) excessive physical movements may trigger the rupture of vessels infiltrated by neurofibroma.

This presentation will impact the forensic science community by reporting a rare case of lethal cervical hemorrhage associated with NF1. Forensic pathologists should consider vascular complications as a potential cause of death when dealing with sudden death in NF1 patients.

NF1 is one of the most common phacomatoses . It is an autosomal dominant disorder that occurs in approximately 1 in 3,000 newborn infants. The disease is caused by loss-of-function mutations in the gene encoding the tumor suppressor neurofibromin, which lead to the growth of tumors such as neurofibromas.[1] NF1 patients are also at high risk of developing malignant tumors that are a common cause of death in this population. Although rare, vascular complications have also been described as potentially lethal morbidities in NF1.[2]

This presentation reports the case of a 42-year-old woman with NF1 who was admitted to the hospital after complaining of facial and neck swelling while having physiotherapy. On arrival at the emergency room, she presented with an acute respiratory distress and collapsed. Despite an emergency cricothyroidotomy and cardiopulmonary resuscitation, she died a few minutes after her admission.

A whole body Computed Tomography (CT) scan performed before the autopsy revealed an extensive prevertebral hematoma of the neck, associated with a mild kyphoscoliosis of the cervical spine. In addition to the classic hallmarks of neurofibromatosis, external examination revealed facial and cervical swelling as well as scattered petechial hemorrhages on the face. A correctly positioned cricothyroidotomy was also present. Upon internal examination, the major finding was a massive retro-pharyngeal hematoma that markedly deformed the anterior neck structures. Histology revealed a diffuse infiltration of the walls of small cervical blood vessels and of the surrounding soft tissues by a plexiform neurofibroma, with no evidence of malignant transformation.

Death was considered to be due to an acute upper airway obstruction of a large retropharyngeal hematoma caused by an infiltrating neurofibroma. NF1-related vasculopathy is a well recognized but uncommon entity. The intrinsic form, characterized by an accumulation of cells in the intima of the blood vessel, should be distinguished from the invasion of the vessel by a neurofibroma usually growing in a plexiform pattern. Disruption of the vessel is due to weakening of its wall caused by the extensive infiltration by neural fibers.[2]

Vascular complications, such as acute hemorrhages, are the second most common cause of death after malignancy in NF1 patients. Spontaneous hemorrhages, primarily due to the rupture of arterial aneurysms, have been reported in this population in different body locations; however, association of NF1 with neck hemorrhages is rare and is at high risk of lethal upper airway obstruction.[3] As excessive movements of the head have been reported to be sufficient to

cause the rupture of cervical vessels previously invaded by the tumor, it can't excluded that physiotherapy may have played a role as a triggering factor in the onset of the hemorrhage in this case.[3]

In conclusion, this case illustrates that, although uncommon, acute hemorrhages are life-threatening complications in NF1 patients. Clinicians should be able to make a prompt diagnosis so that a proper treatment can be undertaken without delay, while forensic pathologists should consider them as a potential cause of sudden death when investigating deaths in patients with NF1.

Reference(s):

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