



## Pathology Biology Section – 2007

### G95 An Unusual Case of Sudden Death

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After attending this presentation, attendees will learn the importance of implementing the dissection of the atrio-ventricular node in all necropsies; but particularly in cases of sudden death.

This presentation will impact the forensic community and/or humanity by illustrating the utility of conduction system evaluation and its association with mechanism of death as discovered in conjunction with an unusual breast neoplasm.

A 49-year-old Asian female was found dead in her residence. Two weeks prior to her death, she presented to a local Emergency Room for pain and swelling of her right breast. Clinical examination revealed bilateral breast masses, suggestive of carcinoma. A mammogram was ordered, but never performed due to the patient's demise. Review of medical records reveal a mammogram performed six months prior, which was interpreted as negative. Evidence of a recent biopsy was identified at the time of autopsy; however, despite extensive searching the biopsy results were never located. The autopsy revealed a 7 cm mass in the right breast and a 2 cm mass in the left breast, both of which had an appearance clinically suggestive of carcinoma. The adrenal glands were completely replaced by tumor nodules. The heart weighed 195 gm and the posterolateral left ventricular wall and interventricular septum contained soft, white masses that ranged in size from 0.6 cm to 3.5 cm. There was no pericardial effusion or pericardial thickening. Of note, there were only two (right neck and supraclavicular) enlarged lymph nodes but no axillary lymph nodes; despite the large tumor burden in the breasts. A small nodule was identified in the right lower lobe of the lung. The remainder of the internal organs were unremarkable. Microscopic examination of the breast masses revealed a primary non-epithelial breast neoplasm with involvement of the heart, lung and adrenal glands. Immunohistochemical analysis of the tumor was consistent with a large cell lymphoma of T-cell origin (CD 45 +, CD 3 +, CD 20 -, pancytokeratin -, CD 57 - and ALK1 -). Myocardial involvement included transmural infiltration, as expected from the grossly visualized masses, as well as focal permeation of the atrioventricular node, which was not associated with a grossly visible lesion. The enlarged lymph nodes were negative for lymphoma.

Primary breast lymphoma (PBL) is a rare form of extranodal non-Hodgkin's lymphoma accounting for less than 1% of all breast malignancies. Of these, the great majority will represent B-cell, rather than T-cell lymphomas. PBL is bilateral in up to 25% of the cases and the clinical presentation is similar to that of carcinomas of the breast, with the exception of slightly larger masses at the time of diagnosis. The growth is rapid, and several cases have been reported with recent negative mammograms, as in this case. Lymphoma has a high predilection to involve the heart, with an incidence of 25%, second only to lung carcinoma. Most cases with cardiac involvement are clinically silent and/or have non-specific symptoms until they present with sudden death.

The mechanism of sudden death related to carcinomas and lymphomas is often not determined, as these deaths generally are not considered 'unusual, unnatural or unexpected' deaths and therefore may not fall under the jurisdiction of the medical examiner or coroner. Known complications such as pulmonary emboli, treatment related problems, such as infection, or overall tumor burden are common enough processes that forensic pathologists typically don't perform autopsies. Even when performed in a hospital setting, it is unlikely that the hospital pathologist will examine the conduction system on such a case. As part of a thorough autopsy in a medical examiners office, the cardiac conduction system (in particular the atrioventricular node), is being examined more often and is occasionally revealing the underlying cause for the sudden death. Any foreign cell population, whether neoplastic or inflammatory in origin, in the atrioventricular node can precipitate an arrhythmia which may result in sudden death. In the presented case, not only were the cause and manner of death determined, but also the mechanism involved.

#### **Breast Lymphoma, Atrioventricular Node, Sudden Death**