



## Pathology Biology Section – 2007

### G43 Pediatric Malignancies Presenting as Sudden Death: A Case Series

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After attending this presentation, attendees will learn how pediatric malignancies, though rare, may present as sudden death. Careful examination of the history and physical findings will aid in the ultimate cause of death.

This presentation will impact the forensic community and/or humanity by aiding in better understanding of pediatric malignancies in sudden death.

The goal of this presentation is to review causes of sudden death due to previously undiagnosed malignancies in the pediatric population from 1994 to 2006 at the Office of the Chief Medical Examiner in Louisville, Kentucky.

Five deaths due to malignancies in children between the ages of five months and fourteen years were identified during this time period. Two Wilm's tumors, a T-cell mediastinal acute lymphoblastic lymphoma, and two acute myeloblastic leukemias are listed as the causes of death. None of the five cases reported had a previous diagnosis of malignancy prior to death. In fact, one case (AML M5) was thought to be a victim of child abuse due to the physical findings of bilateral black eyes.

Cases 1 and 2: Unlike death in the case of Wilm's tumor due to intraperitoneal hemorrhage reported by Somers et al, the children in both of these Wilm's tumor cases of died as a result of pulmonary tumor emboli. A five-year-old girl followed closely by her family physician for mild developmental delay was participating in class activities and was thought to have fallen asleep in class. She was unarousable, and subsequently it was determined she had died. At autopsy, a 6.5 cm Wilm's tumor was found in the upper pole of the left kidney, with extensive but microscopic pulmonary tumor emboli within all lobes of the lungs. The second Wilm's tumor was found in a three-year-old boy who had a three day history of vague abdominal pain and constipation. He collapsed after being given antacids for his pain. The 8.0 cm tumor within the left kidney caused a large tumor thrombus within the inferior vena cava and a tumor embolus with occlusion of the right ventricular outflow tract and pulmonic trunk.

Case 3: A ten-year-old boy presented to his primary care doctor five times in the three months preceding his death with complaints of fever, cough, wheezing, and neck swelling. He was diagnosed at the last visit as having pneumonia with a widened mediastinum. That evening he began gasping for air, became cyanotic, and collapsed. At autopsy a 470 gm, 22.0 cm mediastinal mass completely encased the aortic arch and great vessels, trachea, anterior pericardial sac and hilum. The superior border of the mass was the thyroid gland. Immunophenotyping confirmed a T-cell mediastinal acute lymphoblastic lymphoma. In this case no other organs were involved.

Case 4: A 14-year-old girl with a three week history of headache, abdominal pain, extreme fatigue and fevers, was brought to the emergency room in full arrest. She had been seen in the ER three times in the week prior to her death with the above listed symptoms and given a clinical diagnosis of pharyngitis with a suspected etiology of infectious mononucleosis. At autopsy a large intracerebral hemorrhage was found, with petechiae in all visceral organs. In addition to massively enlarged visceral lymph nodes, leukemic infiltrates were found within the spleen, liver, heart, adrenals, and brain. Immunohistochemical stains performed on the paraffin embedded tissue confirmed the diagnosis of acute myeloblastic leukemia.

Case 5: A five-month-old boy presented to an outlying hospital with a two day history of gasping for air, bloody emesis, lethargy, and decreased urine output. He rapidly deteriorated in the emergency room, and was brought to a local hospital where he was pronounced dead. A history of abuse or neglect by the family was suspected due to severe bilateral periorbital ecchymoses, and multiple additional contusions. After his death, laboratory results revealed his white count to be 269,000. At autopsy, small bowel intussusception with resultant bowel necrosis was identified, with an extensive leukemic infiltrate. Ensuing disseminated intravascular coagulation led to petechiae and the large periorbital ecchymoses, as well as extensive subarachnoid hemorrhages. Leukemic infiltrates were found within the pericardial sac, liver, kidneys, leptomeninges, pancreas, spleen, gastrointestinal tract, and lung leading to acute pulmonary crisis. Immunophenotyping revealed an acute monocytic leukemia (M5).

These cases correlate with one recent paper in which Wilm's tumor and white cell malignancies were the most common malignancies presenting as sudden death in the pediatric age group. These findings differ from another paper, which found that tumors, malignant or benign, involving the central nervous system and heart were most common in their case series. Accidents are the most common cause of death in the pediatric



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age group, with cancer being second. Leukemia is the most common malignancy in children between the ages of 0-19, followed closely by central nervous system malignancies. These constitute the two most common causes of cancer deaths in this age group. Most malignancies are diagnosed by classic signs and symptoms, failure to thrive, weight loss, fatigue, feeling poorly, and autopsies on these patients, when requested, are undertaken in the hospital setting with a known or suspected diagnosis. In the five cases presented, preceding symptoms did not lead to a timely diagnosis. Sudden death is a rare, unfortunate presentation of pediatric malignancy.

**Sudden Death, Malignancy, Pediatric**