



Pathology Biology Section – 2010

G91 Lethal Consequences Arising From the Rupture of an Undetected Large Ductus Arteriosus Aneurysm During a T-12 Kyphoplasty Procedure

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After attending this presentation, attendees will appreciate the complications encountered with a patent ductus arteriosus, the necessity for repair of the ductus, and a rare case of rupture of an undetected patent ductus arteriosus aneurysm.

This presentation will impact the forensic science community by addressing the importance of diligent diagnostic assessment of all patients. The decedent had undergone numerous prior imaging studies with failed recognition of a large ductus arteriosus aneurysm, and failure to detect such lesions can have disastrous consequences. Additionally, this case illustrates the importance of a thorough autopsy examination with toxicologic assessment to clarify the circumstances of in-hospital/intraoperative deaths, recognizing the potential civil litigative pitfalls should such an approach not be pursued.

The case of an 80-year-old white female who suffered hypertensive crisis and cardiovascular collapse during T-12 kyphoplasty is reported. The decedent had been admitted to the hospital for kyphoplasty to repair a T-12 compression fracture. She had a history of prior cerebrovascular accident, hypertension, hyperlipidemia, and osteoporosis. During the procedure, the decedent experienced a spike in blood pressure to approximately 200/100 mmHg, with sudden cardiovascular collapse. Resuscitative efforts were unsuccessful. Autopsy examination revealed rupture of a large ductus arteriosus aneurysm producing a large left hemothorax. The aorta and its main branches showed marked arteriosclerotic change with Monckeberg calcific sclerosis, and the heart was enlarged, with biventricular hypertrophy. Additionally, examination revealed arterionephrosclerosis and adrenal cortical hypertrophy. The cause of death was listed as massive left hemothorax due to rupture of a large ductus arteriosus aneurysm associated with marked aortic arteriosclerotic change, with calcific sclerosis during kyphoplasty of T-12, associated with intraoperative hypertensive crisis.

The ductus arteriosus connects the aorta to the pulmonary artery and functions in the fetus to bypass the unexpanded lungs. Ordinarily, this connection closes shortly after birth, but in some infants the ductus arteriosus remains patent. A patent ductus arteriosus creates a left-to-right shunt and can lead to complications like congestive heart failure, infective endocarditis, and aneurysm with subsequent rupture. However, not all individuals with a patent ductus arteriosus become symptomatically evident, and some people can live normal lives never knowing they have this congenital abnormality. In the rare case of a patent ductus arteriosus aneurysm, the ductus must be repaired to prevent rupture of the aneurysm. Rupture of a ductus arteriosus aneurysm is a devastating event and often leads to a swift death.

Detection of a large ductus arteriosus aneurysm can often be accomplished through the acquisition of a chest x-ray, though arteriography is the definitive technique if such an anomaly is suspected. While multiple imaging studies of her chest had been conducted in the past, the decedent's large ductus arteriosus aneurysm was nonetheless not identified. It is unclear what event prompted the sudden, lethal hypertensive event which led to aneurysm rupture, though an adverse event arising from administered anaesthetic agents must be considered as a potential etiology. The tragic consequences arising from this sad sequence of events is a sobering lesson that uncommon and unsuspected diagnoses are far too commonly lethal.

Ductus Arteriosus, Aneurysm, Rupture