Title: Unusual Complication of Left Pigtail Chest Tube Insertion

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ABSTRACT BODY:
Objective: To report an unusual complication associated with pigtail chest tube insertion in the left thorax.

Case Summary: A previously healthy 3 year old female was transferred to our institution following intubation for respiratory failure. She had experienced a week of upper respiratory tract infection symptoms followed by flank pain, polyuria, polydipsia, abdominal distention, and respiratory distress. The patient was diagnosed with atypical hemolytic-uremic syndrome, malignant hypertension, left posterior cerebral artery stroke with watershed infarcts in ACA/MCA territory, and renal failure due to thrombotic microangiopathy. She was intubated for 13 days and extubated to Vapotherm respiratory support. Her respiratory status remained tenuous and a chest x-ray was interpreted by the PICU staff as a persistent pleural effusion on the left. During the placement of the pigtail chest tube catheter using standard landmarks for insertion, initial advancement of the introducer needle revealed strongly pulsatile blood flow. With the assumption that this was likely in the heart, the chest tube procedure was completed instead of removing the needle to avoid the risk of leaving a puncture wound in the heart and possible resultant pericardial tamponade or hemothorax. The chest tube was immediately clamped upon placement and cardiothoracic surgery and cardiology were consulted. Transthoracic echocardiography revealed a catheter in the left ventricle. The patient remained hemodynamically stable and was taken emergently to the operating room. After confirming the availability of packed red blood cells in the operating room, a rapid sequence induction was performed with succinylcholine. Following intubation and placement of new arterial and central venous lines, a transesophageal echocardiogram (TEE) probe was placed. Imaging confirmed the pigtail catheter in the left ventricle with only minimal pericardial fluid and adequate ventricular filling. A sternotomy was performed and the left pleura was opened. The catheter was visualized passing through a completely atelectatic left lower lobe and into the pericardium, just missing the phrenic nerve and circumflex coronary artery. A horizontal mattress pledgeted suture was placed surrounding the catheter which was removed and the suture tied. The patient remained hemodynamically stable during throughout. However, the left lung remained markedly atelectatic despite aggressive measures to re-expand the lung. The patient was transported back to the PICU intubated where she later underwent bronchoscopy. Findings included significant mucus plugging, bronchomalacia of the left lower lobe, and external compression of the left lower lobe bronchus, presumptively from enlarged left ventricle. Repeat transthoracic echocardiogram one week after injury revealed low-normal ejection fraction and mild mitral insufficiency.

Discussion: The rate of complications associated with pigtail catheters for evacuation of pleural air or fluid are very low, approximately 5% as reported by Roberts et al in 1998, but are often very serious. While this complication is not among the more common (pneumothorax, hemothorax, hepatic injury), it is certainly among the more devastating. Complicating factors for this case include a misinterpretation of the chest radiograph to be pleural fluid instead of lung consolidation and unrecognized cardiomegaly. Subsequent patient management likely saved this patient’s life since the majority of deaths following cardiac injury from chest tubes revolve around the removal of the chest tube and resultant hemorrhage. An injury such as this requires the anesthesiologist to be prepared for the possibility of cardiac tamponade, hemothorax, severe left ventricular dysfunction, or unrecognized massive blood loss.

Conclusions: This case should serve as yet another reminder that nothing we undertake is without inherent risk. A seemingly benign chest tube placement narrowly avoided serious damage to a coronary artery and phrenic nerve. However, the swift management and recognition of the intracardiac placement allowed this patient to survive without significant complication and ultimately see discharge from the hospital.

Refs: