Central Venous Catheter Fracture During Thoracoscopic Maze Procedure

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Introduction
The 5-box thoracoscopic maze is performed for the treatment of atrial fibrillation (AFib). This procedure has been shown to be 95% effective after 1-year in maintaining sinus rhythm without anti-arrhythmics in patients with AFib. Anesthetic management includes a central venous catheter (CVC) placed into the right internal jugular vein (IJ) to monitor central venous pressure (CVP), administer vasoactive agents, and act as a rescue line in case of cardiac perforation. At our institution, it is routine to place a 9-Fr percutaneous sheath introducer (PSI) with a double lumen introducer catheter (DLIC) thru the PSI. We describe an intraoperative CVC fracture with cardiac embolization during a thoracoscopic maze and its retrieval.

Case Presentation
A 69-year-old male with a history of AFib presented for a thoracoscopic maze. After intubation with a double lumen endotracheal tube, a radial arterial line and right IJ PSI was placed. A DLIC was inserted locked at 17-cm at the hub. During the procedure, a sudden increase in CVP was noted with loss of a pulsatile tracing. Neither lumen of the DLIC could be flushed or aspirated. The DLIC was removed; however, the catheter tip was not intact. The catheter was suspected to be in the right atrium on transesophageal echocardiography. An electrophysiologist was consulted for endovascular removal at the conclusion of the maze procedure. The catheter was removed successfully from the distal left pulmonary artery. The patient was extubated on post-operative day one and was discharged home 6-days later without further complications.

Discussion
The intraoperative use of CVCs has become routine in cardiac and thoracic surgery. Common complications associated with CVCs include arterial puncture, hematoma, pneumothorax, infection or thrombosis. Other rare complications including loss of catheter integrity are estimated at 0.1%. One center reports an incidence of 2.5% in the pediatric population. In most reports of catheter separation a cause cannot be ascertained; however, shearing during forced insertion or catheter puncture with a suture needle are implicated. Cardiac embolization of a CVC is a rare but potentially serious complication. In this patient, it is likely that during SVC isolation enough energy was transferred to melt the DLIC and sever the catheter. Serious risks of catheter fragment embolization include myocardial perforation or necrosis, cardiac tamponade, myocardial infarction, valve perforation, arrhythmia, and cardiac arrest. Thrombus formation and infectious complications have also been reported. This case highlights a multidisciplinary approach where EP cardiology, cardiac surgery and cardiac anesthesiology were necessary to locate and retrieve a catheter fragment in the safest possible manner.

References