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FIFTEEN-YEAR FOLLOW UP OF A MINIMALLY INVASIVE APPROACH TO EPICARDIAL IMPLANTED CARDIOVERTER DEFIBRILLATOR SYSTEMS IN PEDIATRICS

Objective: Pediatric and congenital heart disease patients present unique challenges to implantable cardioverter defibrillator (AICD) insertion, including small size and limited venous access. Various strategies have been developed to deal with these, including a minimally invasive approach for epicardial device placement using fluoroscopic guidance of a transvenous coil with active fixation inside the pericardium. We set out to report our experience with this alternative approach to epicardial AICD implantation.

Methods: Case series with retrospective data collection

Results: Between 2005 and 2021, 15 patients underwent implantation of an epicardial AICD utilizing an abdominal generator, epicardial pace-sense lead(s), and intrapericardial defibrillation coil actively fixated within the transverse sinus through a single subxiphoid incision, pericardial window, and subrectus pocket. The median age and weight at implant were five years (range 1-17) and 20kg (range 7.9-112), respectively. The median for post-procedure intensive care and hospital length of stay were one and four days, respectively. Perioperative complications were limited to two patients requiring repeat surgical intervention prior to discharge, one for repositioning of a migrated coil and one for drainage of a large pericardial effusion. Defibrillator testing (DFT) was performed at implant and was successful in 11 patients with a median threshold of 15J (range 5-25). The remaining three patients were unable to sustain ventricular fibrillation long enough to allow for DFT. During follow-up, five patients received a total of 83 appropriate shocks with only three failing to convert to sinus rhythm. Inappropriate shocks were rare, with one patient experiencing a total of 16 shocks following a sensing lead fracture. Coil fracture and failed DFT occurred in two patients at 12.5- and 7-years after implant.

Conclusion: Epicardial AICD implant via a single subxiphoid incision is a safe and effective approach for patients with anatomic factors that preclude the use of traditional transvenous or subcutaneous techniques.

Figure 1: epicardial AICD implanted via subxiphoid incision in a 20-month-old 11.4 kg patient with Timothy syndrome

