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Long-term Follow-up after epicardial Pacemaker Implantation in Neonates and Infants: a single center experience

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Introduction: A variety of different surgical techniques and approaches in pacemaker (PM) implantation within the first year of life are used depending on the implanting center's preference. At our institution, we advocate the surgical implantation of epicardial leads to avoid problems associated with transvenous electrodes in a growing child. Our aim is to identify possible long-term benefits and disadvantages of our approach in PM implantation in neonates and infants.
Method: With this retrospective study, we looked at patients undergoing PM implantation within the first year of life at our center. Atrial and ventricular lead sensing and capture thresholds at implantation, after 1, 3, 5 and 7 years and maximal follow-up time in each patient were analyzed. Subgroup analysis was performed in acquired versus congenital atrioventricular block, implantation below or above 1 month of age and with or without previous heart surgery.
Results: A total of 52 consecutive patients at a median age at implantation of 3 (0 – 10) months were identified. PM indications were postoperative atrioventricular block (n = 33), congenital atrioventricular block (n = 12) and sinus node dysfunction (n = 3). During a median follow-up time of 40.4 (range: 0.1 – 114) months median sensing remained between 3.1 and 4.0 mV for atrial leads and between 10.0 and 14.4 mV for ventricular leads. Pacing thresholds were 0.7 V for atrial leads and 1.2 V for ventricular leads. There was no adverse pacing effect on left ventricular function and dimensions over time. 20 PM related reoperations had to be performed in 13 / 52 (= 25%) patients. Indications for these reoperations consisted of infection (n=3), battery exhaustion (n=10), generator dislocation (n=3), lead dysfunction (n=3) and diaphragmatic paresis (n=1). There was no pacemaker-related mortality. No significant differences in ventricular pacing threshold in various etiologies were found. Median interval from implantation to first generator (and/or electrode) replacement was 44 (0.7 – 98) months.
Conclusion: Our results show that epicardial PM implantation in neonates and infants is a safe and effective procedure. Our current implant technique and pacing strategy shows good long- and mid-term results with a low rate of complications.