

P512

New approaches to pacing in children with atrioventricular block

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Introduction: The placement of permanent pacemaker is presented as one of the most appropriate procedures in patients with congenital complete atrioventricular block (AVB). Despite video-assisted thoracic surgery (VATS) for epicardial lead placement has demonstrated positive results concerning the feasibility and freedom of complications in adults, its role in pacemaker implantation in children remains unclear.

The study aimed to assess the intermediate-term outcomes of video-assisted thoracic pacing in children with congenital complete AVB.

Methods: From May 2017 to November 2018, six children with complete idiopathic AVB underwent minimally invasive left ventricular lead placements via thoroscopic video assistance. The procedure was performed under complex intratracheal anesthesia with single-lung ventilation, median operation time was 180 minutes (120–240). Four incisions were made, three of them were used to place the lead on the left ventricular, and one was needed to place the device. All pacing parameters were evaluated in perioperative and follow-up periods.

Results: Median age at implantation was 3 years (2 to 15 years), median weight 13 kg (12–46 kg). All procedures were completed successfully, pacing thresholds for the active lead measured 0.5–1.1V, with R-wave amplitude of 8–18 mV and impedance of 404–1478 Ohm. Increasing pacing thresholds in the third month after pacemaker implantation occurred in one patient, so anti-inflammatory therapy was assigned. Satisfactory thresholds and impedances with no significant difference with initial values were obtained at the median follow-up of 21 months (range: 10–28 months).

Conclusion: Video-assisted thoracic pacing may provide a potential alternative to the transthoracic approach of epicardial lead placement in children with congenital AVB.