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Long-term outcomes and complications of transvenous pacemaker implantation in small infants

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OBJECTIVES: Evaluation of long-term outcome and complications of transvenous pacemaker implantation in paediatric patients weighing less than 10 kg.

METHODS: We retrospectively analysed the outcome and complications of all implantations in small children (<10 kg) of pacemakers (PM) with transvenous leads between September 1997 and October 2001. Indications for PM-implantation, age at implantation and follow-up duration were noted. Furthermore, both cardiac and PM function and complications due to transvenous approach were evaluated.

RESULTS: During the study period 7 patients underwent implantation of a VVI(R) PM system with a transvenous lead. The median age at implantation was 54 days (range, 1 day - 1.13 years), the median weight 4.7 kg (range, 2.3 - 8.7 kg) and the median duration of follow-up 13.7 years (range, 12.1 – 16 years). Indications for PM-placement were congenital complete heart block in 4 patients, long QT-syndrome type II with AV-node dysfunction in 2 and postoperative heart block and sinus node dysfunction in 1. There were no procedural complications. All patients are still alive, with currently no cardiac complaints and a good PM-function. Four patients got an upgrade to a DDD system. Two patients suffered from vascular occlusion of the left subclavian vein, 6 and 8 years after PM-implantation respectively. In 2 patients a small thrombosis on the PM-electrode developed, 7 and 11 years after PM-implantation respectively; both successfully treated with anticoagulants. In 3 patients the PM-system was converted to an epicardial system due to symptomatic vein occlusion, systolic dysfunction and atrial perforation. One patient developed dilated cardiomyopathy. Six patients developed mild to severe tricuspid valve insufficiency after lead placement, necessitating surgical tricuspid valve repair in 1. Two patients underwent relocation of the PM-battery due to skin traction and 2 patients underwent repositioning of their leads to the right atrium after observance of PM-dysfunction, both within 2 years after PM-implantation. Five patients needed removal of their old PM-electrode because of lead replacement (n=1), atrial perforation (n=1) and switch to an epicardial system (n=3).

CONCLUSION: Transvenous lead implantation in very small children is associated with a high incidence of severe complications and should be avoided in this patients.