

Interventional closure of muscular VSDs at a young age

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Purpose: The presence of muscular ventricular septal defects (mVSD) may pose an high circulatory burden in young patients. Surgical closure is difficult because of the multilayer structure of these malformations. We present the course of 13 patients (age 10 days – 7.3 years, median 9 months; bodyweight 2.2 and 18 kg (median 8.7 kg) undergoing transcatheter closure of such defects.

Method: All closures were assisted by transesophageal echo guidance. Entrance sites and routes of delivery were chosen according to the anatomic presentation of the defect. For transvascular closure of 5 singular and 8 multiple mVSD 5 Amplatzer PDA II occluder, 6 Amplatzer VSD occluder and 4 Amplatzer vascular plugs IV were used. Follow-up time ranges from 23 days to 2.8 years (mean 1.2 years).

Results: 3 defects were observed closed immediately. 9 mVSD showed a residual shunt immediately after the implantation procedure, which further reduced during follow-up in all patients. In one patient a second defect opened up after closure of one defect and was closed in a second attempt. Two intra-procedural complications occurred. A sudden complete AV-Block led to transcatheter explantation of the device in one patient. This patient with a restrictive cardiomyopathy died during follow-up. In one patient on ECMO a left ventricular perforation with the device already in place had to be over sewn in an emergency operation.

Conclusion: With some of the newer devices available, which pass through smaller delivery sheaths of 4 to 6 F, interventional closure of mVSD has become a feasible option in the treatment of patents of all ages and a bodyweight from 2.2 kg on, who present with elevated right ventricular pressures and high shunt volume. The procedure is challenging in newborns and infants and severe complications may occur.