

## Short and Mid-Term Outcomes of Premounted Stents in Pulmonary Artery Rehabilitation for Patients with Tetralogy of Fallot

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### Abstract

**Background:** The low profile design of premounted stents (PST) allows for the treatment of vascular stenosis in small patients, including pediatric patients with congenital heart disease. Our aim was to describe the short and mid-term outcomes of PST for pulmonary artery rehabilitation in patients with tetralogy of Fallot (ToF).

**Methods:** All PST placed within the pulmonary arteries (PAs) of patients with ToF at our institution were evaluated retrospectively. Patient characteristics and stent implantation data were collected during the initial stent implantation. Follow-up data on surgical and catheter-based re-interventions were collected to determine risk factors for re-intervention.

**Results:** PST were placed in 21 PAs of 16 patients at a median age and weight of 2.9 years (interquartile range (IQR) 1.5-7.4) and 12.9 kg (IQR 10.6-26.2), respectively. The success rate was 95%, with one unsuccessful implant due to stent embolization. Over a median follow-up period of 3.6 years (IQR 2.6-5.3), surgical intervention was not performed in any patient. A total of 14 PAs in 10 patients had follow-up catheterizations, with 12 PAs (8 patients) requiring re-intervention at a median time of 11.2 months (IQR 10-32.8). Although not reaching statistical significance, patients requiring re-intervention tended to be younger (median age 1.9 vs 10 years) and smaller (median weight 12 vs 26.2 kg) at initial implant. Of the 12 PAs with recurrent stenosis, the mechanism of recurrent stenosis was in-stent stenosis (ISS) in 9 (75%). Thus, the overall rate of ISS for the entire cohort was 43% at a median time of 10 months (IQR 6.6-11.2) post-implant. Previous surgical vessel augmentation was associated with the development of ISS (100% vs 58%,  $p=0.045$ ). Having a stent to vessel size ratio  $>1$ , or "oversizing the stent," was not associated with the development of ISS.

**Conclusions:** The use of PST within PAs of patients with ToF may be effective in delaying, if not preventing, surgical intervention of these vessels. Previous surgical augmentation is a risk factor for ISS. Smaller and younger patients may be at risk for recurrent stenosis, and a larger cohort might elucidate this. Routine follow-up catheterization should be considered to evaluate for ISS, as it developed in nearly half of patients with PST and in all patients with prior surgical augmentation.