

## Extracardiac Fontan Fenestration Device Closure: Acute Results and Mid-Term Follow up

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**Background:** A fenestration is a modification to the Fontan operation performed in single ventricle patients. If the fenestration does not close spontaneously, it may be closed in the catheterization laboratory, allowing for improvement in oxygen saturations and reduced risk of systemic embolic events. The purpose of this study is to evaluate the safety and efficacy of this procedure at a single institution.

**Methods:** Perform a retrospective review of all patients who underwent cardiac catheterization for device closure of a Fontan fenestration at Cardinal Glennon Children's Hospital between September 2004 and September 2016. Review the medical record for patient demographics, clinical and procedural data, and follow up data. Record and compare oxygen saturation and Fontan conduit pressure pre and post fenestration closure, and obtain follow up clinical data.

**Results:** 56 patients underwent 57 attempts at device closure of a Fontan fenestration, 32 (56.1%) with the Amplatzer Vascular Plug II (AVP II), and 25 (43.9%) with the Amplatzer Septal Occluder (ASO). All were successful except for one patient where an embolized AVPII was retrieved. The procedure was then successfully performed 7 months later. There were no other procedural complications. Following device closure, the mean aortic saturation increased by 8.3% ( $p < 0.001$ ) and the mean conduit pressure increased by 0.5 mmHg ( $p < 0.001$ ). The patients were followed for an average of 3.5 years (2 weeks – 8.4 years), at which time mean transcutaneous oxygen saturation was 95.4%. All patients were doing well at follow up except for one patient who developed plastic bronchitis. This was thought to be secondary to native atrial septal restriction present prior to device closure, which improved following surgical revision.

**Conclusion:** Device closure of Fontan fenestration is safe and effective, resulting in significant increase in aortic saturation with minimal increase in Fontan conduit pressure. The mid-term follow up data is reassuring.

**Figure 1.** A) Aortic saturations pre-closure, post-closure, and at follow up with mean and standard deviation. B) Conduit pressures pre-closure and post-closure with mean and standard deviation.

