# 3D Rotational Angiography-Guided Stent Placement for Treatment of Acquired Supravalvar Aortic Stenosis

Jason H. Anderson, M.D.[1], Kenneth A. Fetterly, Ph.D.[2], Nathaniel W. Taggart M.D.[1]

[1]Department of Pediatric and Adolescent Medicine/Division of Pediatric Cardiology, Mayo Clinic, Rochester MN
[2]Department of Medicine/Division of Cardiovascular Diseases, Mayo Clinic, Rochester MN

## Background

Acquired supravalvar aortic stenosis (svAS) is an uncommon complication of cardiac surgery usually associated with surgical incision of the ascending aorta. Transcatheter stent implantation to treat svAS is generally avoided due to concern for disruption of nearby structures including coronary arteries, aortic valve and brachiocephalic arteries.

## Methods

We present a case of a 15 year old male with svAS after aortic valve replacement who was successfully treated with endovascular stent placement under three-dimensional rotational angiography guidance.

## Results

A 15 year-old male with a history of d-transposition of the great arteries, status post arterial switch procedure with Lecompte maneuver, underwent surgical aortic valve replacement with a 23 mm bioprosthesis due to progressive neo-aortic valve regurgitation. At routine follow-up eight months after surgery, he was found to have significant supravalvar aortic stenosis with a Doppler mean gradient >50 mmHg.

After a discussion with the cardiac surgeon, the patient underwent cardiac catheterization for stent placement in the ascending aorta. Peak systolic gradient between left ventricle and aortic arch was 50 mmHg. Three-dimensional rotational angiography (3DRA) using a DynaCT system (Siemens, Munich, Germany) demonstrated aortic root dilatation with severe narrowing of the mid-ascending aorta to 9 mm. A 2612 Intrastent LD Max (ev3-Endovascular, Plymouth, MN) open-cell stent was placed across the stenosis on a 16 mm x 4 cm NuMed balloon-in-balloon system (NuMed, Hopkinton, NY) using 3DRA overlay guidance and rapid right ventricular pacing. Gradient across the area was <5 mmHg after stent placement. Repeat 3DRA demonstrated improved caliber of the ascending aorta and no evidence of aneurysm, dissection, contrast extravasation or disruption of surrounding structures.

## Conclusions

This case demonstrates the value of 3DRA in percutaneous stent placement. The use of 3DRA facilitated accurate measurement of vessel length for optimal stent selection and precise stent positioning, thus avoiding disruption of the bioprosthetic valve, coronary arteries, and brachiocephalic vessels.