

JOINT EVENT

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## Off-pump aortic valve bypass to treat severe aortic stenosis

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Majority of patients suffering from aortic valve stenosis are treated by aortic valve replacement or *via* transcatheter aortic valve implantation. However, a subset of patients having severe comorbidities, such as renal insufficiency, severely impaired ejection fraction, bicuspid aortic valve, large aortic annulus, ostial encroachment, redo-operation as well as severely calcified porcelain aorta, have a relevant periprocedural risk. For this patient cohort an alternative treatment, aortic valve bypass (AVB) with placement of a valved fabric graft between the left apex and descending aorta, is considered. Though already developed in the early 1960's surgical acceptance was low due to the lack of appropriate instruments and the need for cardiopulmonary bypass (CPB). However, with the development of a coring device (Correx, Inc., Waltham, MA, USA) these impediments have been overcome. We report on a 72-year-old male patient suffering from severe low-flow-low-gradient aortic valve stenosis (left ventricular ejection fraction 20%, mean pressure gradient 26 mmHg, valve orifice area 0.7 cm<sup>2</sup>). Clinical symptoms were those of congestive heart failure. Previously the patient had undergone balloon valvuloplasty without major improvement. On the basis of concomitant mutilating diagnosis the patient was rejected for conventional surgery and transcatheter treatment. Thus AVB was suggested. The AVB consists of two components (a straight valve-containing conduit with a porcine valve and an angled left ventricular connector) and bypasses the blood flow *via* the left ventricular apex into the descending aorta. Perioperative course of our patient with implantation of the AVB without CPB was uneventful as was the postoperative course. A magnetic resonance imaging of the heart on the fourteenth postoperative day demonstrated 55% of the cardiac output passing *via* the conduit (2.6 l/min was measured in the descending aorta, 2.1 l/min in the ascending aorta). We recommend off-pump AVB in patients with severe aortic stenosis when other therapy options are ruled out.



Figure 1 : Postoperative MRI showing the position of the AVB

### Recent Publications

1. Reuthebuch O, Fassl J, Brown J, Grapow M and Eckstein F (2013) Early experiences and in-hospital results with a novel off-pump apico-aortic conduit. *Interactive CardioVascular and Thoracic Surgery* 16:482–7.
2. Sarnoff S J, Donovan T J and Case R B (1955) The surgical relief of aortic stenosis by means of an apical-aortic valvular anastomosis. *Circulation* 11:564–75.
3. Elmistekawy E, Lapierre H, Mesana T and Ruel M (2010) Apico-aortic conduit for severe aortic stenosis: Technique, applications and systemic review. *Journal of the Saudi Heart Association* 22(4):187–94.
4. Vliek C J, Balaras E, Li S, Lin J Y, Young C A, De Filippi C R, et al. (2010) Early and midterm hemodynamics after aortic valve bypass (apicoaortic conduit) surgery. *The Annals of Thoracic Surgery* 90:136–43.
5. Adams C, Guo L R, Jones P M, Harle C, Brown J W and Gammie J S (2012) Automated coring and apical connector insertion device for aortic valve bypass surgery. *The Annals of Thoracic Surgery* 93:290–3.

### Biography

Prerana Banerjee has gained her experience in Cardiac Surgery. Her interest and work in different hospitals in Switzerland allowed her to witness various operation techniques. During residency with PD Dr. O. Reuthebuch she learned about the alternative technique for treating severe aortic stenosis.