

First experience of a novel decellularized patch material (CardioCel™) for aortic valve reconstruction in congenital heart surgery

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Objectives

The search for optimal patch material is an ongoing challenge in congenital heart surgery (CHS). In this study, we report our first experience with the use of a novel decellularized bovine pericardial patch material (CardioCel™) for aortic valve reconstruction (AVR) in CHS.

Methods

We retrospectively studied 28 patients (median age 10 (1,7-34) years, median weight 28 (9-100) kg) who underwent AVR using CardioCel™ Patch at our institution between February 2014 and August 2015. 9 patients suffered from predominant aortic valve stenosis, 19 patients showed predominant aortic valve insufficiency. Echocardiographic results preoperatively, at discharge and median 14 (2-18) months following the operation were used for the assessment of graft appearance and performance. Data are presented as median values.

Results

Aortic valve reconstruction using CardioCel™ Patch was feasible in all patients without intraoperative difficulties implanting the patch material. There was no perioperative mortality. Median intensive care unit stay was 21 (2-121) hours and the median hospital stay was 7 (5-12) days. Echocardiography at discharge showed excellent patch function, no signs of device calcification, thrombosis or device failure of the presented cases. Mean pressure gradient was reduced in patients with aortic valve stenosis after AVR (47 (30-55) vs 20 (1-30) mmHg) and remained reduced at 10 (2-16) months follow up (22 (6-52) mmHg). In 1 patient restenosis after AVR was seen at 16 months follow up, which was treated by balloon valvuloplasty. Aortic valve insufficiency was reduced after AVR (grade 3 (2-3) vs 1 (0-2)) and remained low (grade 1 (1-2)) at 14 (12-18) months follow up.

Conclusion

This study demonstrates promising early results for the use of CardioCel™ patch AVR in patients with congenital heart disease and aortic valve lesions. Implantation was free of tissue related complications and mid-term patch function showed good results.