

Five-Year Clinical Outcomes of Isolated Aortic Valve Replacement via Right Anterior Mini-Thoracotomy

Ali Fatehi Hassanabad, Andrew Maitland, Daniel D Holloway, Corey A Adams, William DT Kent

Section of Cardiac Surgery, Department of Cardiac Sciences, Libin Cardiovascular Institute, Cumming School of Medicine, Calgary, Alberta, Canada

Introduction

Contemporary surgical approaches for aortic valve replacement (AVR) include full median sternotomy, hemi-sternotomy, and right anterior mini thoracotomy (RAMT). Many studies have confirmed the safety and feasibility of RAMT AVR, and several centres have demonstrated excellent operative results, low risk of mortality and perioperative stroke, which are comparable to conventional full sternotomy AVR.

Objective

There is a paucity of data on longer term follow-up after RAMT AVR. We report the five-year clinical outcomes of RAMT for isolated AVR.

Methods

This retrospective study investigated the 5-year clinical outcomes of patients who underwent isolated RAMT AVR in Calgary, Canada.

End-Points

Primary outcomes were death and disabling stroke within 30 days of surgery.

Secondary outcomes were survival at 5-years follow-up, hospital readmission for aortic valve disease, prosthetic valve function (transvalvular mean pressure gradient and paravalvular leak), and incidence of structural valve deterioration requiring reintervention on the valve.

Patient selection and pre-operative work-up



Older
Thin
Aorta right of midline
Ascending to chest wall distance < 9 cm
No AR
No peripheral vascular disease



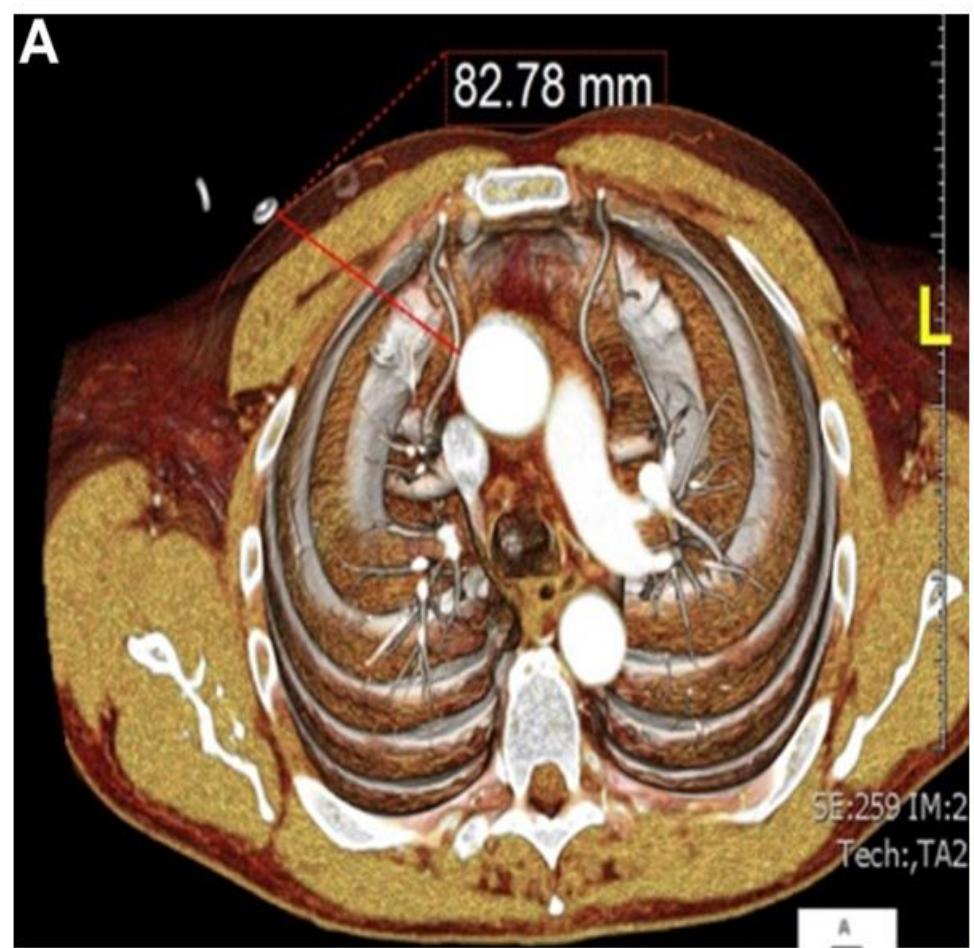
Previous right chest surgery
Previous sternotomy (CABG)
Calcified ascending
More than moderate AR
Obesity (ascending to chest wall > 9 cm)
Ascending aorta to left of midline
Calcified femoral arteries (if peripheral cannulation)

Preoperative CT scan is essential for RAMT

Because of its technical complexity, not all patients are candidates and surgeons must be particularly selective early in their experience

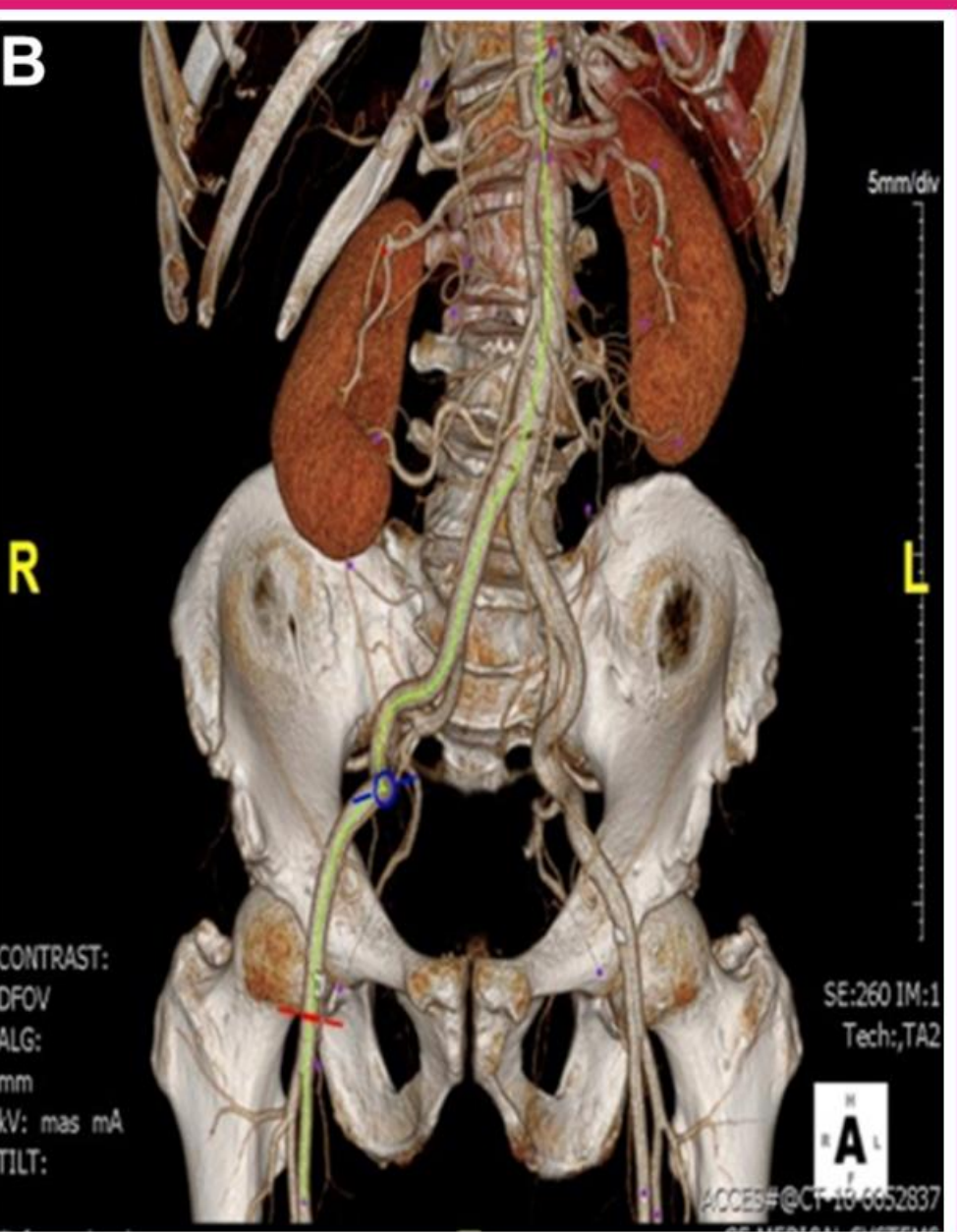
The ascending aorta should not be displaced leftward

On axial imaging at the level of the pulmonary artery bifurcation, at least half of the aorta should be to the right of the ipsilateral sternal border



At the pulmonary artery bifurcation, the aorta should be <10 cm deep to the chest wall at the mid-clavicular line

Cannulation is most commonly performed femorally via percutaneous puncture or a small cutdown, thus CT images should confirm adequate size and absence of severe calcification of the femoral vessels



Results

Table 1: 5-year outcomes of isolated RAMT AVR

Outcomes (n=60)	
Male	32
Female	28
Death	11
Multi-system failure	2
MI	1
Non-cardiac causes	8
Re-hospitalization for aortic valve	0
Re-intervention on prosthetic valve	0
Median sternotomy	2
CABG	1
MVR and TVr	1

Table 2: Echocardiographic outcomes at 5-years

Outcomes (n=60)	
Structural valve deterioration	0
Mean trans-valvular pressure gradient (mmHg)	11.85 ±7.17
Paravalvular leak greater than mild	0