

Aortic Root Surgery: Does High Surgical Volume and a Consistent Perioperative Approach Improve Outcome?

Rajdeep Bilkhu, MRCS, Pouya Youssefi, MRCS, Gopal Soppa, PhD, FRCS (CTh), Rajan Sharma, FRCP, Anne Child, MD, FRCP, Mark Edsell, FRCA, Jean-Pierre van Besouw, FRCA, and Marjan Jahangiri, FRCS (CTh)

There is evidence that high surgical volume and team consistency improve outcomes. Mortality of 4%-12% for aortic root surgery has been reported in the United States and UK. We aim to assess outcomes of patients undergoing aortic root surgery by a consistent, high-volume team. Data on patients undergoing elective or urgent aortic root replacement (ARR) were collected prospectively. Patients undergoing emergency surgery were excluded. A standardized perioperative approach was maintained and was achieved by delivering training to team members, including surgical trainees, anesthetic, nursing, and perfusion staff, whenever there was a change of team. Between 2005 and 2014, 344 patients underwent ARR. Median age was 59 years (18-86) and 74% were men. Procedures included ARR (biological [186; 54%] or mechanical [101; 29.4%]) and valve sparing root replacement, remodeling technique (57; 16.6%). A total of 42 patients (12.2%) underwent concomitant procedures. There were 4 (1.2%) in-hospital deaths and no incidence of stroke. In total, 3 (0.9%) required re-sternotomy for bleeding and 8 (2.3%) required hemofiltration. Follow-up was complete for 94% of patients with median intensive care unit and hospital stays of 1 and 6 days, respectively. Follow-up was complete for 94% of patients at a median of 5.6 years with 98% freedom from reoperation and prosthetic valve dysfunction. There was 90% freedom from aortic insufficiency at 7 years in the valve sparing root replacement, remodeling technique cohort. We have demonstrated that high surgical volume and standardized care improves outcomes in aortic root surgery. Maintaining a consistent perioperative approach ensures team members are aware and well rehearsed in their roles, thereby improving outcomes.

Semin Thoracic Surg 28:302-309 © 2016 Elsevier Inc. All rights reserved.

Keywords: aortic root, aortic root replacement, outcomes, training

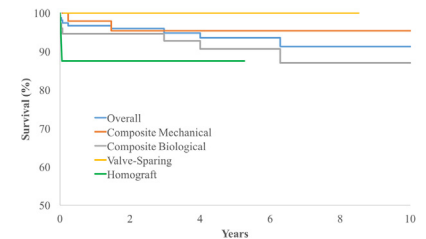
INTRODUCTION

Aortic root replacement (ARR) is performed for pathology of the aortic root, including aneurysm, dissection, connective tissue disease, and in some cases, endocarditis of the aortic valve. Operations of the aortic root carry significant risks and morbidity, even in experienced hands. Data from the Society of

Departments of Cardiothoracic Surgery, Cardiology and Anesthesia, St. George's Hospital, London, UK

Marjan Jahangiri is the lead clinician on the clinical evaluation committee for Engager Valve (Medtronic). Other authors have no disclosures to make.

Address reprint requests to Marjan Jahangiri, FRCS (CTh), Department of Cardiothoracic Surgery, St. George's Hospital, Blackshaw Road, London SW17 0QT, UK. E-mail: marjan.jahangiri@stgeorges.nhs.uk



Long term survival following aortic root replacement.

Central Message

High surgical volume and standardized perioperative care improves outcomes in aortic root surgery.

Perspective Statement

Aortic root replacement is a challenging procedure, even in experienced hands. High surgical volume has been linked to improved outcomes in aortic root surgery. We present our experience of aortic root replacement by maintaining high volume and a consistent perioperative approach.

See Editorial Commentary on pages 310-311.

Thoracic Surgeons database have shown overall mortality for elective and urgent aortic root surgery of 4.2%, with only 5% of sites performing more than 16 aortic root operations per year and that the median number of ARR per site was 2.¹ In the last return to the Society for Cardiothoracic Surgery in Great Britain and Ireland database, overall mortality for elective and urgent aortic root surgery was 8%-12%.² This reflects mortality figures from regional units within the UK.³

There is evidence to suggest that improvements in short- and long-term outcomes in patients undergoing aortic root surgery can be achieved in centers with high operative volume.^{4,5} Because of the idea of developing referral centers that specialize in certain pathologies and procedures has been entertained. The

AORTIC ROOT SURGERY

American College of Cardiology Foundation and American Heart Association guidelines recognize that improved outcomes in aortic root surgery are seen at centers with established experience.⁶ Indeed, it has been shown that there is a favorable association between high operative volume and reduced postoperative morbidity and mortality, particularly in aortic surgery, but also in other areas of cardiac surgery.⁷⁻⁹ Despite this, a recent study has suggested that thoracic aortic surgery may be performed with similar results by high-volume and low-volume surgeons.¹⁰ Our objective was, therefore, to assess the outcomes of patients undergoing elective and urgent aortic root surgery to evaluate whether maintaining high surgical volume as well as a consistent perioperative approach improve outcomes.

METHODS

Study Population

Between 2005 and 2014, demographic, clinical, and operative data for all consecutive patients undergoing urgent and elective ARR or valve sparing aortic root replacement (VSRR) under a single surgical and anesthetic team were collected prospectively. Local ethical approval (equivalent to institutional review board) was obtained. Patients having surgery under 1 surgical firm were the subjects of this study, to assess the effects of consistency, a standardized operative and anesthetic approach and high volume. Patients who underwent emergency surgery were excluded as most patients underwent supracoronary replacement of the ascending aorta, with or without arch replacement, but did not require root replacement. In addition, most emergency procedures were performed out of hours when it was not possible to maintain a consistent perioperative approach. The primary end point was operative mortality. Secondary endpoints were the incidence of complications; mortality during follow-up; the need for further surgery and recurrence and freedom from aortic insufficiency (AI) in patients undergoing VSRR.

Definitions

The definition for high volume surgery, for the purposes of this study, was derived from the publication by Hughes et al,⁴ which showed that patients undergoing elective ARR at North American hospitals that performed fewer than 30-40 aortic root operations annually per center have greater mortality than those undergoing surgery at higher volume centers. We, therefore, considered a case volume of more than 30 per year for a single surgical team to be high volume.

Elective surgery was defined as planned surgery performed at more than 1 week from the decision to

operate. Urgent surgery was defined as surgery being performed more than 24 hours, but less than 1 week, after unplanned hospital admission. Emergency surgery was defined as surgery performed within 24 hours of unplanned hospital admission. The terms elective, urgent and emergency used here are described by The Society for Cardiothoracic Surgery of Great Britain and Ireland and National Institute for Clinical Outcome Research who publish surgeon specific results.²

Postoperative transient ischemic attack or stroke was defined as new brain injury diagnosed clinically or radiologically. Postoperative renal dysfunction was defined as needing hemofiltration in patients not previously dialyzed or need for dialysis for the first time. Operative mortality was defined as death before hospital discharge.

Anesthetic Protocol and Perioperative Care

Standard methods for the induction and maintenance of anesthesia were used. Complex cases were discussed at a preoperative team meeting to plan access for arterial cannulation and invasive pressure monitoring. In the case of aortic arch surgery, 2 separate invasive blood pressure monitoring lines were sited. All patients underwent cerebral perfusion monitoring using near-infrared spectroscopy along with a treatment algorithm to manage low values during cardiopulmonary bypass (CPB). Hemoglobin on CPB was maintained above 8 g/dL.

The decision for chest reopening for bleeding was based on the patient bleeding > 300 mL/h in the first 3 hours in the absence of coagulopathy or sudden massive bleeding or significant hemodynamic instability.

To assess coagulopathy, thromboelastography and multiplatelet analyzer (Cobas Roche) for platelet function were used. Hemostatic blood products were used in the presence of abnormal tests.

Fluctuation in blood pressure was minimized at all times especially following termination of bypass to reduce neurological events. Transesophageal echocardiography (TEE) was performed for all cases. The specific utility of TEE in these cases was to perform aortic valve and root measurements, to guide the efficacy of de-airing procedures and to assess valvular and ventricular function following discontinuation from CPB.

The routine use of blood products was avoided. All patients were treated postoperatively in the intensive care unit where early weaning from ventilation was encouraged where possible.

Download English Version:

<https://daneshyari.com/en/article/5621539>

Download Persian Version:

<https://daneshyari.com/article/5621539>

[Daneshyari.com](https://daneshyari.com)