

Survival and Reinterventions After the Ross Procedure in Adults: A 28 Year Follow-Up Study

Objective: To evaluate the long-term clinical outcomes of adult patients randomly assigned to undergoing a Ross procedure for the treatment of aortic valve disease.

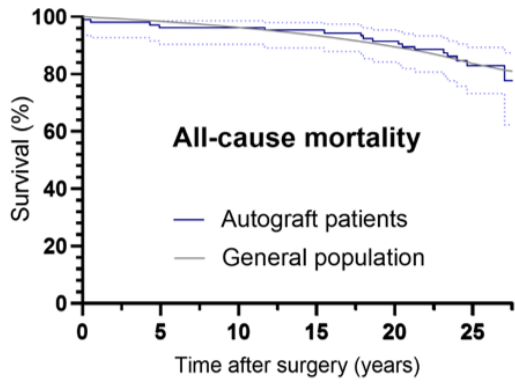
Methods: From 1994 to 2001, 216 adults requiring aortic valve surgery were randomly assigned to undergo a Ross procedure or homograft aortic root replacement in a single center in the UK. Long-term outcomes after the Ross procedure were investigated. The primary endpoint was long-term survival, which was compared to the age-, origin- and sex-matched general population by a novel patient-level matching strategy. Secondary outcomes were freedom from any valve-related reintervention, autograft reintervention and allograft reintervention, and functional status at last follow-up using the NYHA classification. Median duration of clinical follow-up was 24.1 years (IQR 22.6-26.1 years; 2488 patient-years) and was 98% complete.

Results: After randomization, 108 adult patients (15% female) with a median age of 37.7 years (IQR 29.0-48.0 years) underwent a Ross procedure using a freestanding root technique. Of those, 8% had active endocarditis (n=9) and 42% were reoperations (n=45). The main lesion was aortic stenosis in 28% (n=30) and aortic regurgitation in 45% (n=49). There was one perioperative death (<1%). A total of 16 patients died during the study period. Actuarial survival at 25 years was 83.0% (95%CI, 75.5-91.2%), representing a relative survival of 99.1% (95%CI: 91.8-100%) compared to the matched general population (survival in general population:83.7%). At 25 years, actuarial freedom from any reintervention was 71.1% (95%CI: 61.6-82.0%), freedom from autograft reintervention was 80.3% (95%CI: 71.9-89.6%) and freedom from allograft reintervention was 86.3% (95%CI: 79.0-94.3%). At a median last follow-up of 24.6 years (IQR 23.2-26.2) among 93 patients, 80 patients (86%) were in NYHA class I or II.

Conclusions: In young adults with aortic valve disease, the Ross procedure provides excellent survival into the 3rd decade after the operation, which is equivalent to the matched general population. Additionally, long-term freedom from reintervention demonstrates that the Ross procedure is a durable aortic valve substitute into late adulthood, showing a delayed but progressive rate of degeneration. These data further confirm the unique benefits of a living valve substitute and support the need for a reevaluation of current guidelines for the treatment of aortic valve disease in young adults.

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Time-to-event outcomes after the Ross procedure



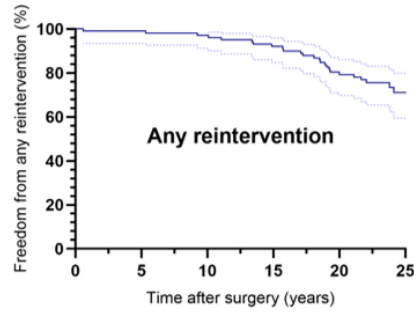
No. at risk

108	104	102	99	95	45
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Actuarial survival

100%	96.3%	96.3%	95.4%	91.5%	<u>83.0%</u>
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100%	98.4%	96.3%	93.5%	89.5%	<u>83.7%</u>
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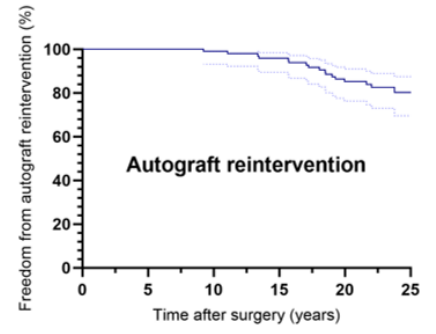


No. at risk

108	103	99	89	74	18
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Actuarial survival

100%	99.1%	97.1%	92.1%	79.3%	<u>71.1%</u>
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No. at risk

108	103	100	92	78	19
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Actuarial survival

100%	100%	99.0%	96.0%	85.3%	<u>80.3%</u>
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