Bilateral versus single internal thoracic coronary artery bypass grafting: the ART RCT

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Plain language summary

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Introduction

Coronary artery bypass grafting is a surgical procedure aimed at improving blood flow in narrowed or blocked coronary (heart) arteries. The cardiac surgeon typically uses an artery from inside the chest wall (the internal thoracic artery) and veins from the leg to bypass the effected coronary arteries. Growing evidence suggests that using two internal thoracic arteries may be better than one. The main question in the Arterial Revascularisation Trial was 'would the use of two internal thoracic arteries allow patients to live longer after coronary artery bypass graft than those who received a single internal thoracic artery?'

Methods

The Arterial Revascularisation Trial was carried out in 28 hospitals in 7 countries. Patients scheduled to have coronary artery bypass graft and willing to participate in the trial were allocated at random (like tossing a coin) to grafting with either a single or a double internal thoracic artery. Additional vein or arterial grafts were used as considered necessary for that patient. Patients enrolled into the Arterial Revascularisation Trial were then followed-up for 10 years.

Results

A total of 3102 patients were enrolled in the trial; 1548 received bilateral internal thoracic artery and 1554 single internal thoracic artery grafts. Ninety-eight per cent of the patients were followed-up for up to 10 years and no statistical difference in survival was detected between the two groups at this timepoint (20.3% in the bilateral group vs. 21.2% in the single internal thoracic artery group). Additional analyses suggested that using more than one arterial graft, including the radial artery (from the arm), compared with using a single arterial graft, may be better, but this needs to be confirmed by further research.

Limitations

Some patients received a single internal thoracic artery when they should have received bilateral internal thoracic arteries, which could have reduced the efficiency of the trial to detect a difference between the two groups.

Discussion

The Arterial Revascularisation Trial is one of the largest long-term studies in cardiac surgery. This trial did not show that using two internal thoracic arteries during coronary artery bypass graft provides better outcomes for patients than using a single internal thoracic artery. Further results from the trial will be released upon completion of follow-up at 15 years.

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