Boletim Científico

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Resultado Final do ART trial: uso de Duas Artérias Mamárias não Acrescenta Benefícios em Sobrevida e Taxa de Infarto, e Relaciona-se a Aumento na Taxa de Complicações de Esterno

Bilateral versus Single Internal-Thoracic-Artery Grafts at 10 Years

BACKGROUND

Multiple arterial grafts may result in longer survival than single arterial grafts after coronary-artery bypass grafting (CABG) surgery. We evaluated the use of bilateral internal-thoracic-artery grafts for CABG.

METHODS

We randomly assigned patients scheduled for CABG to undergo bilateral or single internal-thoracic-artery grafting. Additional arterial or vein grafts were used as indicated. The primary outcome was death from any cause at 10 years. The composite of death from any cause, myocardial infarction, or stroke was a secondary outcome.

RESULTS

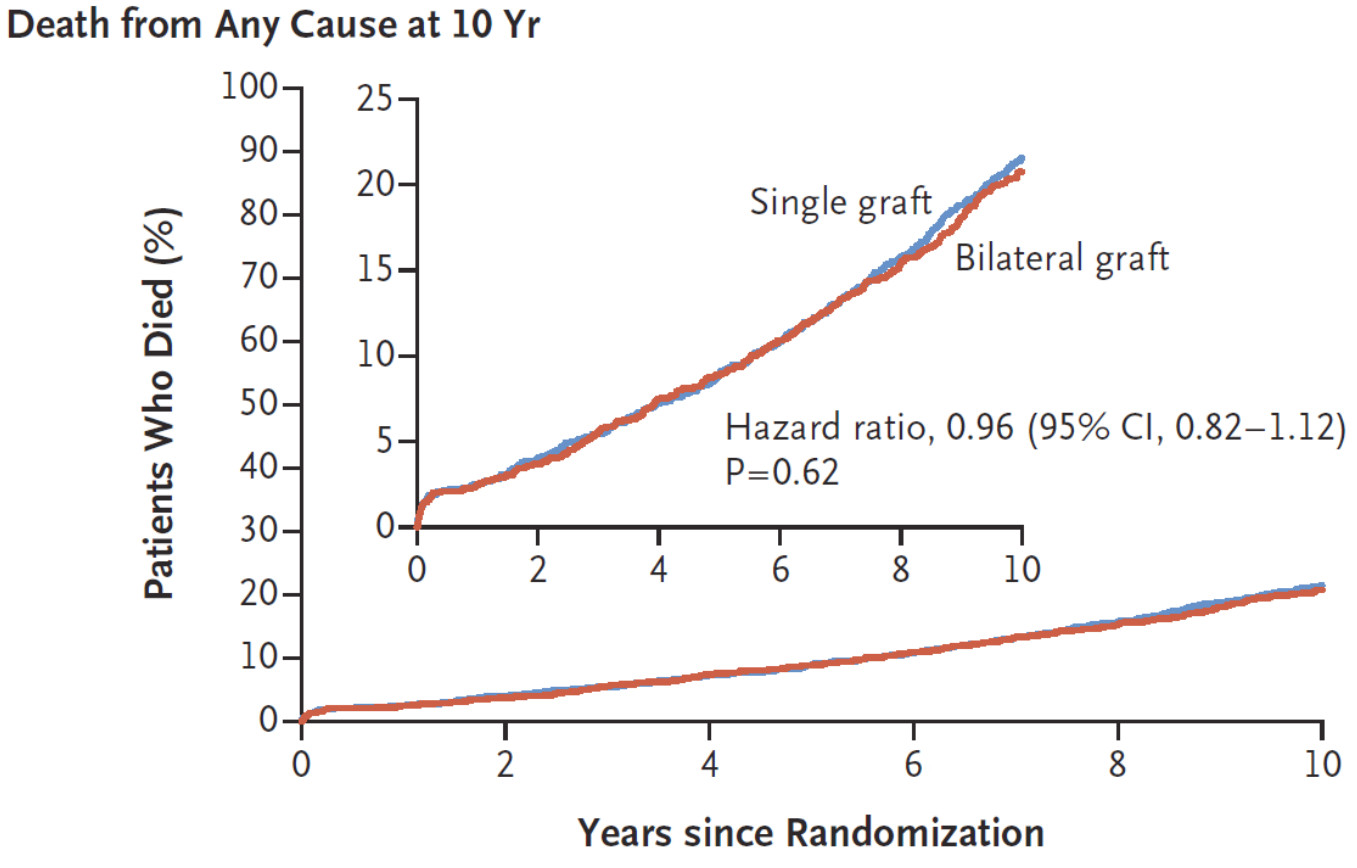
A total of 1548 patients were randomly assigned to undergo bilateral internal-thoracic-artery grafting (the bilateral-graft group) and 1554 to undergo single internal-thoracic-artery grafting (the single-graft group). In the bilateral-graft group, 13.9% of the patients received only a single internal-thoracic-artery graft, and in the single-graft group, 21.8% of the patients also received a radial-artery graft. Vital status was not known for 2.3% of the patients at 10 years. In the intention-to-treat analysis at 10 years, there were 315 deaths (20.3% of the patients) in the bilateral-graft group and 329 deaths (21.2%) in the single-graft group (hazard ratio, 0.96; 95% confidence interval [CI], 0.82 to 1.12; P=0.62). Regarding the composite outcome of death, myocardial infarction, or stroke, there were 385 patients (24.9%) with an event in the bilateral-graft group and 425 patients (27.3%) with an event in the single-graft group (hazard ratio, 0.90; 95% CI, 0.79 to 1.03).

CONCLUSIONS

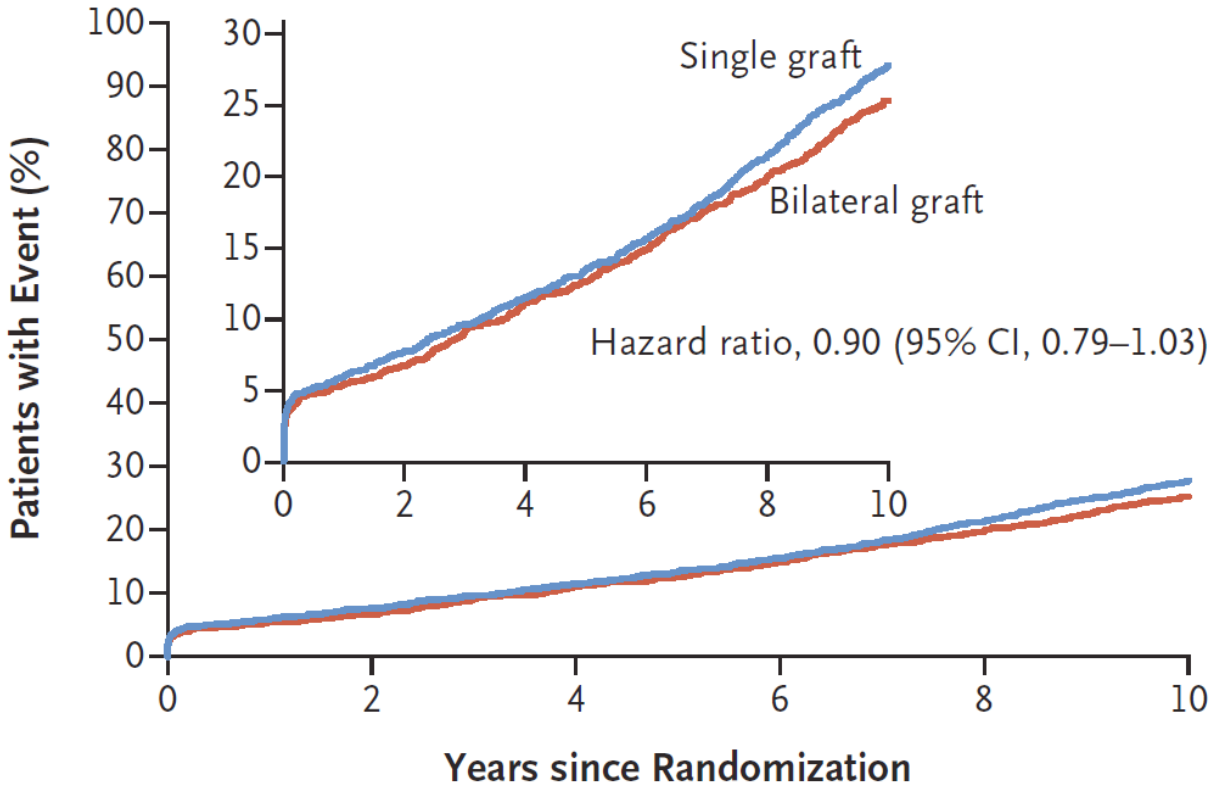
Among patients who were scheduled for CABG and had been randomly assigned to undergo bilateral or single internal-thoracic-artery grafting, there was no significant between-group difference in the rate of death from any cause at 10 years in the intention-to-treat analysis. Further studies are needed to determine whether multiple arterial grafts provide better outcomes than a single internal-thoracic-artery graft. (Funded by the British Heath Foundation and others; Current Controlled Trials number, ISRCTN46552265).

Table 2. Clinical Outcomes and Adverse Events at 10 Years (Intention-to-Treat Analysis).

Variable	Bilateral-Graft Group (N=1548)	Single-Graft Group (N=1554)	Hazard Ratio or Relative Risk (95% CI)*	P Value
	number (percent)			
Clinical outcome				
Primary outcome: death from any cause	315 (20.3)	329 (21.2)	0.96 (0.82–1.12)	0.62
Composite of death, myocardial infarction, or stroke	385 (24.9)	425 (27.3)	0.90 (0.79–1.03)	—
Myocardial infarction†	71 (4.6)	78 (5.0)	0.92 (0.66–1.26)	—
Stroke†	57 (3.7)	76 (4.9)	0.75 (0.53–1.06)	—
Adverse event				
Repeat revascularization	159 (10.3)	156 (10.0)	1.02 (0.83–1.26)	—
Major bleeding‡	52 (3.4)	48 (3.1)	1.09 (0.74–1.61)	—
Sternal wound complication‡	54 (3.5)	30 (1.9)	1.81 (1.16–2.81)	—
Sternal wound reconstruction‡	31 (2.0)	10 (0.6)	3.11 (1.53–6.32)	—



Composite of Death from Any Cause, Myocardial Infarction, or Stroke at 10 Yr



Ann Thorac Surg 2019;107:505-11

Estudo Alerta para o Impacto da Redução de Fluxo durante a Circulação Extracorpórea, na Extração Renal de Oxigênio

Impact of Cardiopulmonary Bypass Flow on Renal Oxygenation in Patients Undergoing Cardiac Operations

BACKGROUND

Cardiac surgery with cardiopulmonary bypass (CPB) is associated with acute kidney injury, and the risk increases with low oxygen delivery during CPB. We hypothesized that renal oxygenation could be improved at higher than normal CPB flow rates.

METHODS

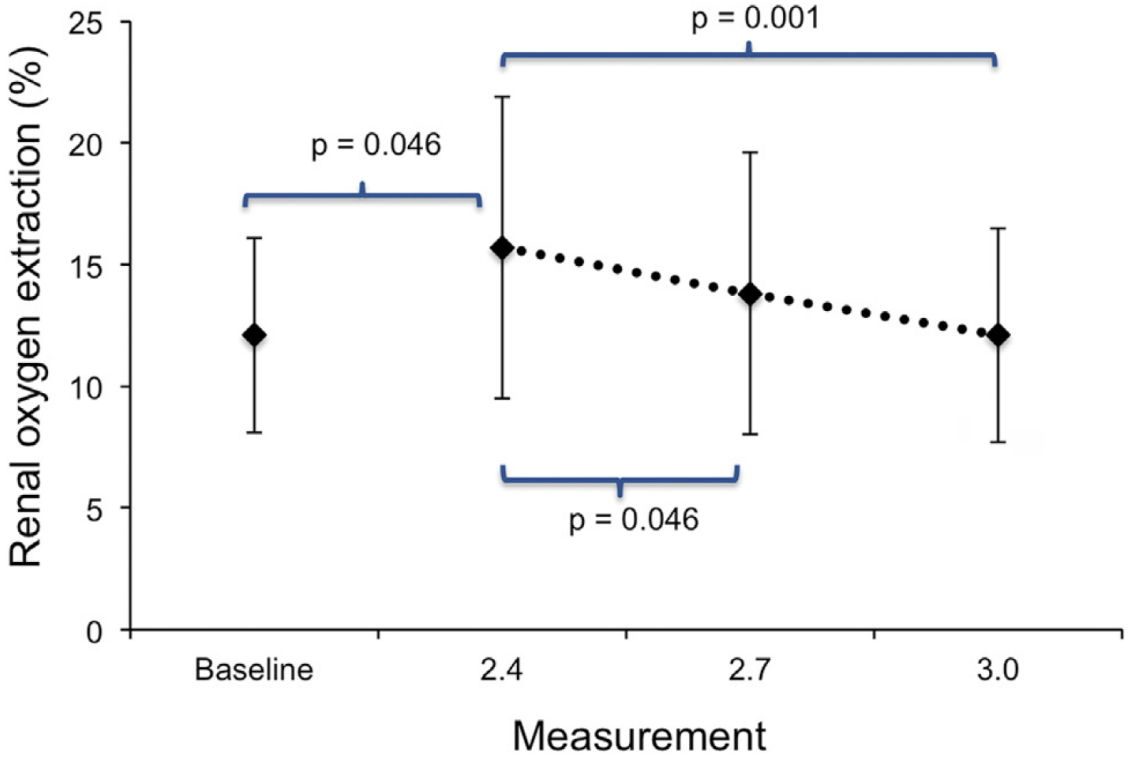
After ethical approval and informed consent, 17 patients with normal serum creatinine undergoing normothermic CPB were included and received pulmonary artery and renal vein catheters after anesthesia induction for measurements of systemic and renalvariables. Renal oxygen extraction, a direct measure of the renal oxygen delivery/renal oxygen consumption ratio, and renal filtration fraction were measured, the latter by renal extraction of 51chromium-ethylenediaminetetraacetic acid. After start of CPB and aortic cross-clamp, the pump flow rate was randomly varied between 2.4, 2.7, and 3.0 L · min^{-1} · m^{-2}, and measurements were made after 10 minutes at each flowrate.

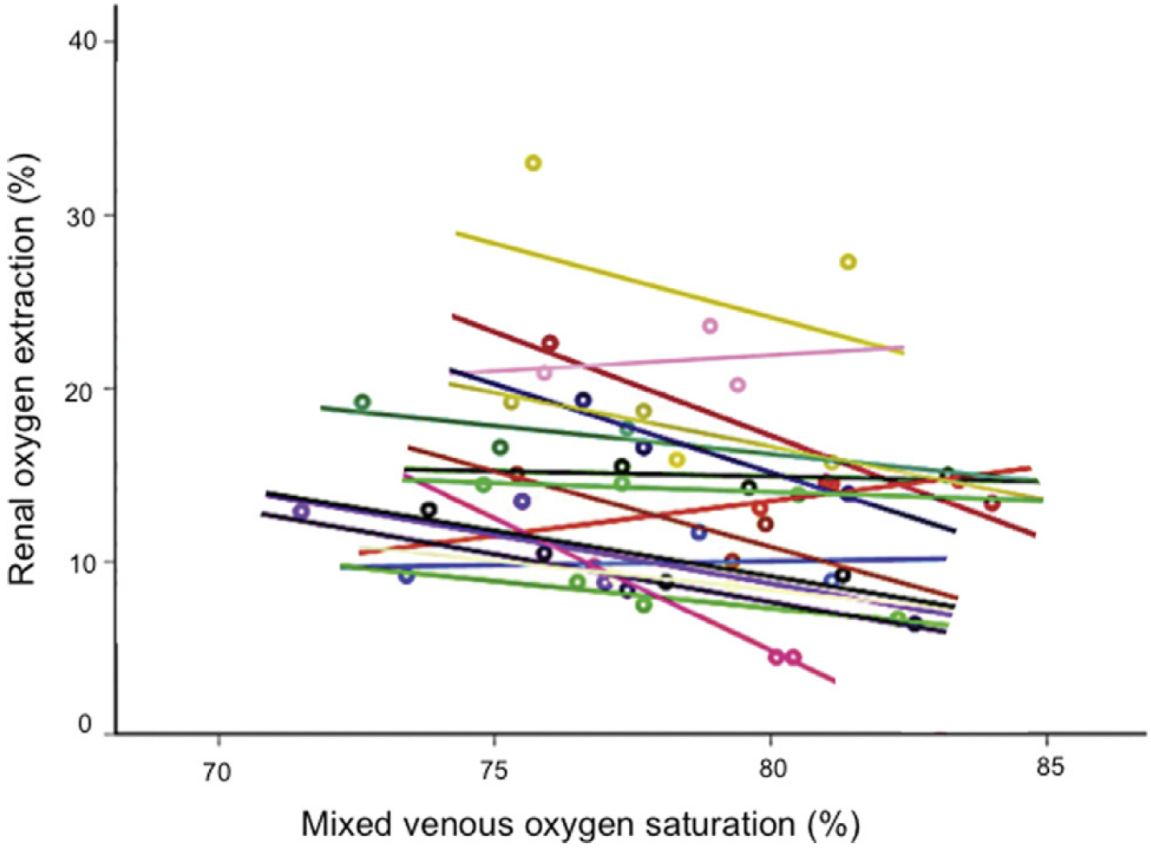
RESULTS

Renal oxygen extraction increased by 30% at a flow rate of 2.4 L · min^{-1} · m^{-2} versus pre-CPB ($P<0.05$). At a flow rate of 2.7 and 3.0 L · min^{-1} · m^{-2}, Renal oxygen extraction was 12% ($P<0.05$) and 23% ($P<0.01$) lower, respectively, compared with 2.4 L · min^{-1} · m^{-2}. This corresponds to a 14% and 30% improvement, respectively, of the renal oxygen supply/demand relationship. Filtration fraction was not affected by changes in flow rate, indicating that the glomerular filtration rate increased in proportion to the increase in renal perfusion.

CONCLUSIONS

The impaired renal oxygenation seen during CPB is ameliorated by an increase in CPB flow rate. Thus, one way to protect the kidneys during CPB could be to use a higher flow rate than the one traditionally used.





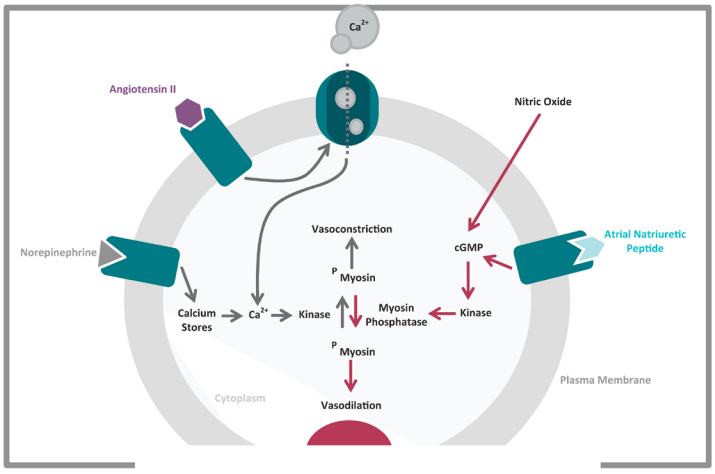
J Cardiothorac Vasc Anesth 2018;32:1013-22

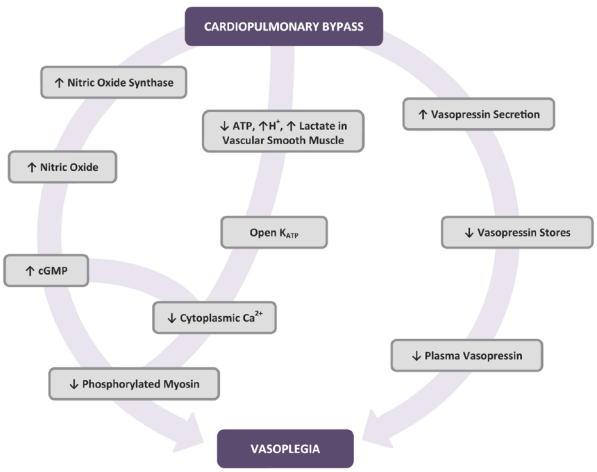
Review Article: Atualização em Síndrome Vasoplégica - Conceitos Revisitados e Questionados

Vasoplegia After Cardiovascular Procedures-Pathophysiology and Targeted Therapy

ABSTRACT

Vasoplegic syndrome, characterized by low systemic vascular resistance and hypotension in the presence of normal or supranormal cardiac function, is a frequent complication of cardiovascular surgery. It is associated with a diffuse systemic inflammatory response and is mediated largely through cellular hyperpolarization, high levels of inducible nitric oxide, and a relative vasopressin deficiency. Cardiopulmonary bypass is a particularly strong precipitant of the vasoplegic syndrome, largely due to its association with nitric oxide production and severe vasopressin deficiency. Postoperative vasoplegic shock generally is managed with vasopressors, of which catecholamines are the traditional agents of choice. Norepinephrine is considered to be the first-line agent and may have a mortality benefit over other drugs. Recent investigations support the use of noncatecholamine vasopressors, vasopressin in particular, to restore vascular tone. Alternative agents, including methylene blue, hydroxocobalamin, corticosteroids, and angiotensin II, also are capable of restoring vascular tone and improving vasoplegia, but their effect on patient outcomes is unclear.





J Am Coll Cardiol 2019;73:643-51

Tratamento Endovascular versus Cirurgia Convencional, em Aneurismas de Aorta Descendente: TEVAR Associa-se a Menor Mortalidade Precoce, mas Maior Taxa de Reintervenções a Longo Prazo

Endovascular versus Open Repair of Intact Descending Thoracic Aortic Aneurysms

BACKGROUND

For the management of descending thoracic aortic aneurysms, recent evidence has suggested that outcomes of opensurgical repair may surpass thoracic endovascular aortic repair (TEVAR) in as early as 2 years.

OBJECTIVES

The purpose of this study was to evaluate the comparative effectiveness of tevar and open surgical repair in the treatment of intact descending thoracic aortic aneurysms.

METHODS

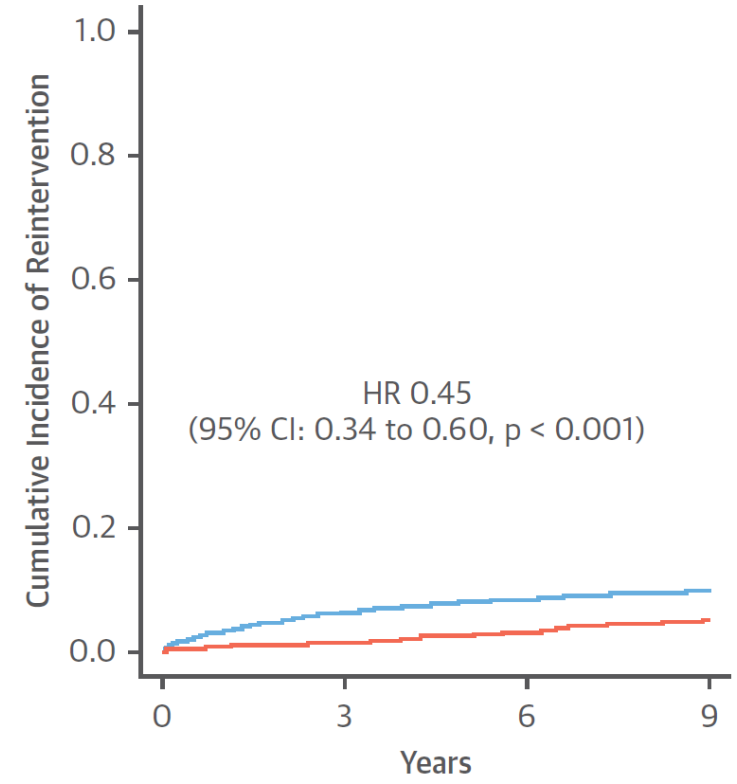
Using the Medicare database, a retrospective study using regression discontinuity design and propensity score matching was performed on patients with intact descending thoracic aortic aneurysms who underwent TEVAR or open surgical repair between 1999 and 2010 with follow-up through 2014. Survival was assessed with restricted mean survival time. Perioperative mortality was assessed with logistic regression. Reintervention was evaluated as a secondary outcome.

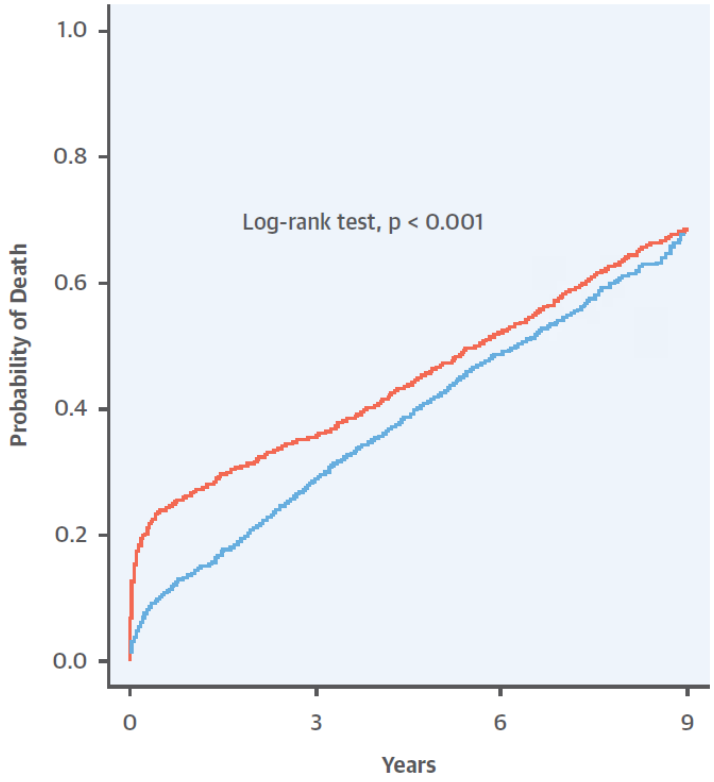
RESULTS

Matching created comparable groups with 1,235 open surgical repair patients matched to 2,470 TEVAR patients. The odds of perioperative mortality were greater for open surgical repair: high-volume center, odds ratio (OR): 1.97 (95% confidence interval [CI]: 1.53 to 2.61); low-volume center, OR: 3.62 (95% CI: 2.88 to 4.51). The restricted mean survival time difference favored TEVAR at 9 years, -209.2 days (95% CI: -298.7 to -119.7 days; P<0.001) for open surgical repair. Risk of reintervention was lower for open surgical repair, hazard ratio: 0.40 (95% CI: 0.34 to 0.60; P<0.001).

CONCLUSIONS

Open surgical repair was associated with increased odds of early postoperative mortality but reduced late hazard of death. Despite the late advantage of open repair, mean survival was superior for TEVAR. TEVAR should be considered the first line for repair of intact descending thoracic aortic aneurysms in Medicare beneficiaries.





J Am Coll Cardiol 2019;73:340-74

Consenso de Especialistas propõe Normatização das Recomentações Técnicas e Institucionais, para Implante Transcateter De Válvula Aórtica (TAVI)

2018 AATS/ACC/SCAI/STS Expert Consensus Systems of Care Document: Operator and Institutional Recommendations and Requirements for Transcatheter Aortic Valve Replacement: A Joint Report of the American Association for Thoracic Surgery, American College of Cardiology, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons

This multisocietal Expert Consensus Systems of Care document was commissioned by the American Association for Thoracic Surgery (AATS), the American College of Cardiology (ACC), the Society for Cardiovascular Angiography and Interventions (SCAI), and the Society of Thoracic Surgeons (STS). Expert Consensus Systems of Care documents are intended to summarize the position of these partnering organizations on the availability, delivery, organization, and quality of cardiovascular care.

With the rapid evolution and dissemination of transcatheter aortic valve replacement (TAVR) technology, it is imperative that the cardiovascular community work together to identify the criteria for performing these procedures safely and successfully. Such criteria serve to guide both practitioners and institutions in the development and maintenance of TAVR programs, in the spirit of optimizing quality outcomes. The unique qualifications to participate in this Field comprise specific interventional skills, high-tech equipment, collaborative clinical management, evolving approaches for alternative access, and multidisciplinary decision making.

The AATS, ACC, SCAI, and STS have joined together to provide recommendations for institutions and individuals to assess their potential for instituting and/or maintaining a highquality TAVR program. The first multisocietal document on institutional and operator requirements for performing TAVR was published in 2012 (1) and is now updated to reflect the current evolution in practice and quality benchmarks.

A strong emphasis on a team-based approach for patient management remains unchanged. Where possible, the writing committee's recommendations are rooted in the robust data accrued from the STS/ACC Transcatheter Valve Therapies (TVT) TM registry.

The writing group has included a multimodal approach to quality measurement that allows the requirements to evolve in anticipation of newer treatment modalities; expansion to younger and lower-risk populations; and emerging evidence regarding patient outcomes, cost, costeffectiveness, and durability.

Figure 1. Evolution of Site Operator Requirements for TAVR

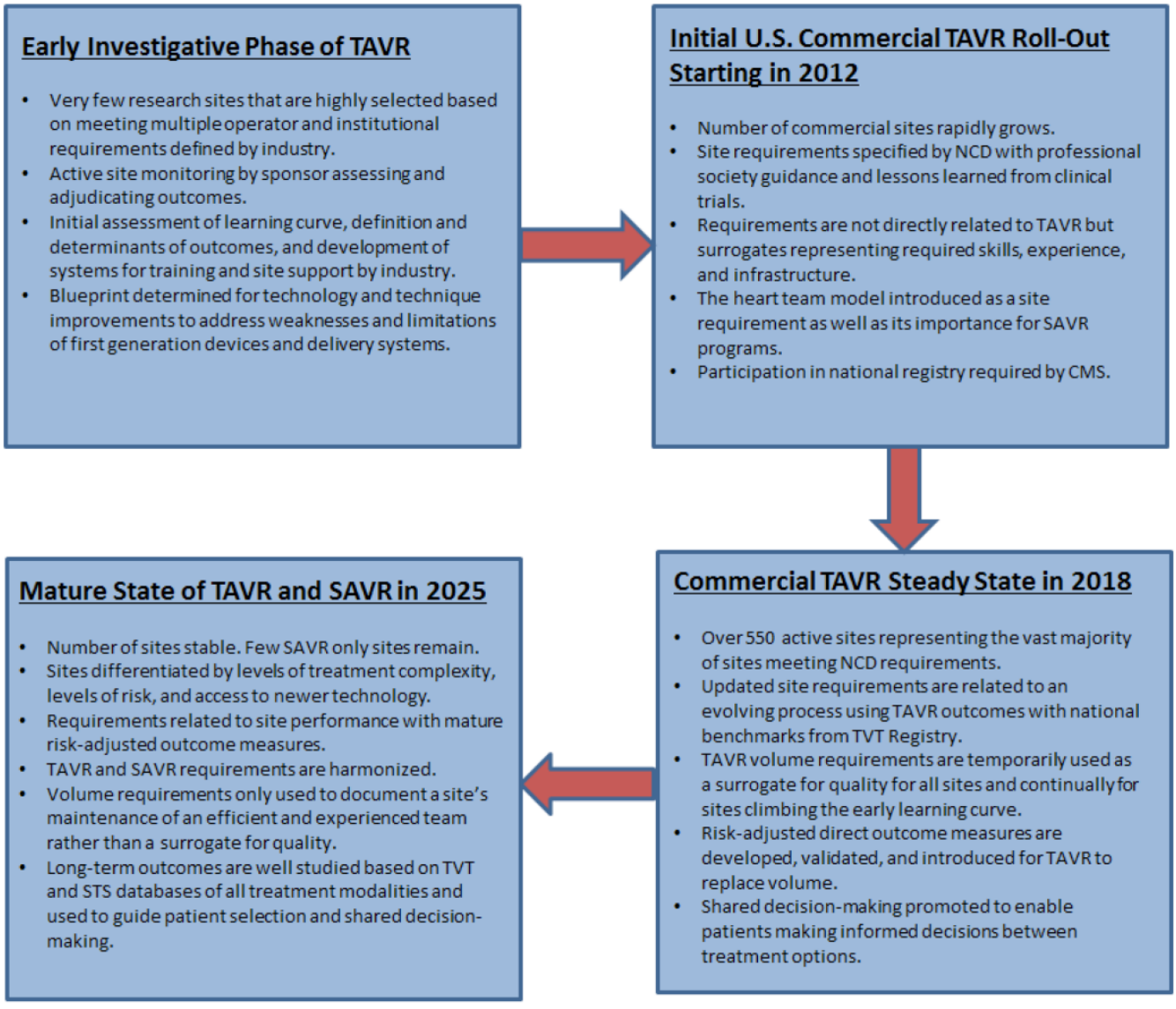


Table 4: Requirements for New TAVR Programs 2018 Criteria

There should be documentation of a multidisciplinary approach and of patient access to all forms of therapy for aortic valve disease (TAVR, SAVR, and palliative and medical care) using an SDM process.
• For all patients with aortic stenosis meeting criteria for valve replacement, there should be documentation of the following:
  ○ Completion of an evaluation by both a cardiac surgeon and a cardiologist with knowledge and experience in both TAVR and SAVR
  ○ Education of patients regarding the treatment recommendations and options by the multidisciplinary team
  ○ Use of an SDM process incorporating patient preference
• For patients undergoing TAVR, there should be documentation of evaluation by 1 surgeon involved in the TAVR program.
  ○ For this requirement to fulfill CMS coverage criteria, the NCD should be updated as it currently recommends evaluation by 2 surgeons for all patients having TAVR.

The proposed TAVR proceduralist for a new TAVR program should document the following: • Prior TAVR experience with participation in 100 transfemoral TAVRs lifetime, including 50 TAVRs as primary operator • Being board eligible or certified in either interventional cardiology or cardiothoracic surgery • Certification of device-specific training on device(s) to be used.
The TAVR sites must have: • The site must have documented expertise, state of the art technology and dedicated board certified imager that is a member of the MDT. • Echocardiography: TTE, TEE and 3D • CT Scan and MR imaging
The proposed TAVR surgeon for a new TAVR program should document the following: • 100 lifetime SAVRs or 25 per prior year or 50 over 2 years and ≥20 SAVRs in the year prior to TAVR program initiation Board eligible or certified by the American Board of Thoracic Surgery or equivalent
The institution should document the following prior to expanding into alternative-access TAVR (e.g., transapical, direct aortic, brachiocephalic arteries, transcaval): • Completion of 80 TAVRs using transfemoral access with an STS/ACC TVT Registry 30-day risk-adjusted TAVR all-cause mortality "as expected" or "better than expected"

Ann Thorac Surg 2019;107:546-52

Factibilidade e Resultados do Implante Transcatater de Válvula Aórtica (TAVI), por Via Axilar

Feasibility and outcomes of Transcatheter Aortic Valve Implantation using the Left Axillary Arteryas Primary Access Site

BACKGROUND

The femoral artery is generally used as primary access for transcatheter aortic valve implantation. However, peripheral artery disease often precludes femoral access. The purpose of this study was to describe clinical outcome of transcatheter aortic valveimplantation using the left axillary artery (LAA) as primary access site.

METHODS

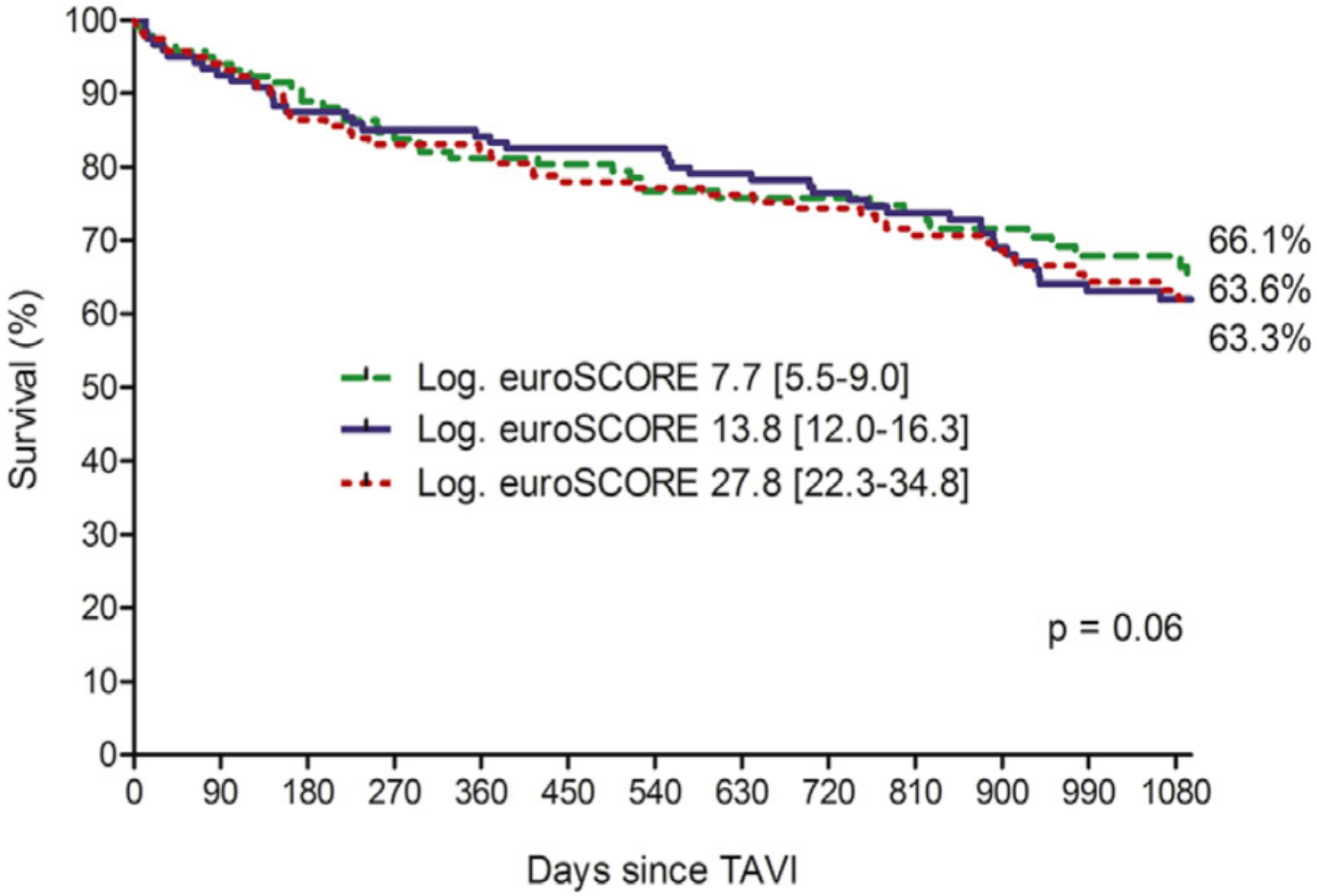
From December 2008 until June 2016, data on all consecutive patients treated with a Medtronic device through the LAA at our hospital were registered, and outcome was prospectively collected according to the updated Valve Academic Research Consortium-2 criteria. Mortality check was performed nationally.

RESULTS

In total, 362 patients were included (median age 80 years [range, 76 to 84]; logistic European System for Cardiac Operative Risk Evaluation 17% ± 12%). Successful axillary access was achieved in 99%. Medtronic CoreValve (86%) and Evolut R (14% [Medtronic, Minneapolis, MN]) were implanted. Major vascular complications occurred in 5% of patients, 1% was LAA related. Life-threatening bleeding and major bleeding were observed in 2% and 10%, respectively. Additional complications were new left bundle branch blood (30%), new permanent pacemaker (11%), and stroke (1%). There were 6 procedural deaths (2%) and 19 deaths (5%) within 30 days. One-year mortality rate was 19%.

CONCLUSIONS

This is the first study reporting outcome after transcatheter aortic valve implantation using the LAA as default access. We conclude that it is highly feasible and safe with low rates of major vascular complications, bleeding, and stroke.


100
90
80
70
60
50
40
30
20
10
0
Survival (%)
0
90
180
270
360
450
540
630
720
810
900
990
1080
Days since TAVI
Log. euroSCORE 7.7 [5.5-9.0]
Log. euroSCORE 13.8 [12.0-16.3]
Log. euroSCORE 27.8 [22.3-34.8]
66.1%
63.6%
63.3%
p = 0.06

J Am Coll Cardiol 2019;73:278-87

Registro Canadense Avalia 12 anos de Seguimento após Fechamento Transcateter de Forâmen Oval Patente (FOP)

Long-Term Follow-Up After Closure of Patent Foramen Ovale in Patients with Cryptogenic Embolism

BACKGROUND

Patent foramen ovale (PFO) closure is the gold standard for treating patients with cryptogenic stroke and PFO. However, scarce data exist on the long-term outcomes following PFO closure.

OBJECTIVES

The purpose of this study was to determine the long-term (>10 years) clinical outcomes (death, ischemic, hemorrhagic events) following transcatheter PFO closure.

METHODS

We included 201 consecutive patients (mean age: 47 ± 12 years, 51% women) who underwent PFO closure due to a cryptogenicembolism (stroke: 76%, transient ischemic attack [TIA]: 32%, systemic embolism: 1%). Echocardiographic examinations were performed at 1- to 6-month follow-up. Ischemic and bleeding events and antithrombotic medication were collected at a median follow-up of 12 years (range 10 to 17 years), and follow-up was complete in 96% of the patients.

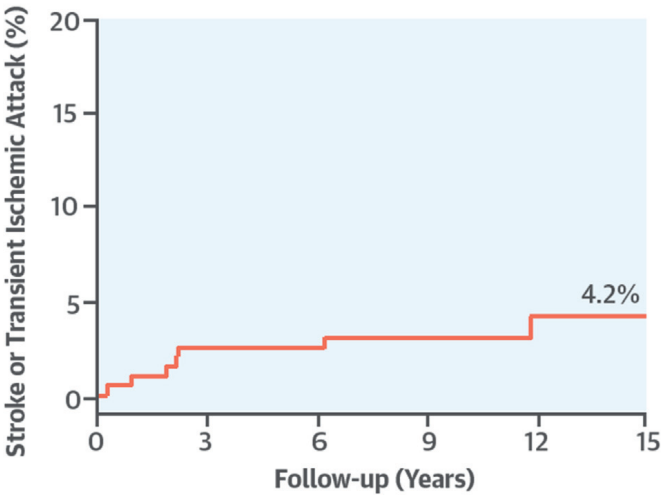
RESULTS

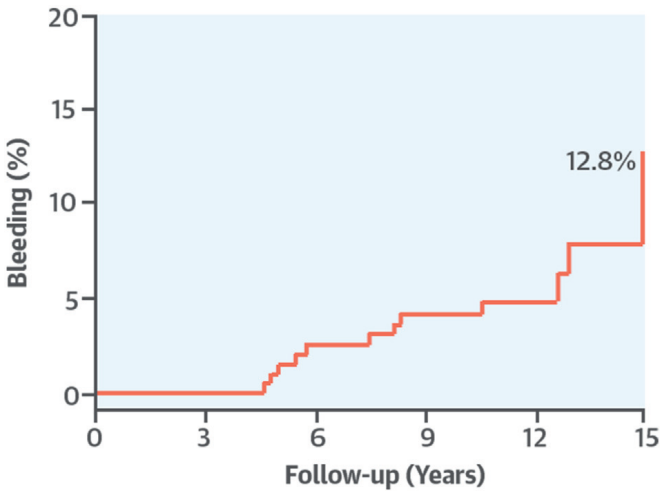
The PFO closure device was successfully implanted in all cases, and residual shunt was observed in 3.3% of patients at follow-upechocardiography. A total of 13 patients died at follow-up (all from noncardiovascular causes), and nondisabling stroke and TIA occurred in 2 and 6 patients, respectively (0.08 strokes per 100 patient-years; 0.26 TIAs per 100 patient-years). A history of thrombophilia (present in 15% of patients) tended to associate with a higher rate of ischemic events at follow-up (P=0.067). Bleeding events occurred in 13 patients

and were major (intracranial bleeding) in 4 patients (all of them under aspirin therapy at the time of the event). A total of 42 patients stopped the antithrombotic treatment at a median of 6 months (interquartile range 6 to 14 months) post-PFO closure, and none of them had any ischemic or bleeding episode after a mean of 10 ± 4 years following treatment cessation.

CONCLUSIONS

PFO closure was associated with a low rate of ischemic events (stroke, 1%) at >10 years of follow-up. Major bleeding events occurred in 2% of the patients (all of them in patients on antiplatelet therapy). One-fifth of patients stopped the antithrombotic therapy during the follow-up period (the majority within the first-year post-PFO closure), and this was not associated with any increase in ischemic events at long-term follow-up.





Ann thorac Surg, march 2019. doi.org/10.1016/j.athoracsur.2018.08.024

Seguimento Tardio de Pacientes após Cirurgia de Fontan: há diferenças entre Circulação Uni ou Biventricular?

Two Ventricles are not Better Than One in the Fontan Circulation: Equivalent Late Outcomes

BACKGROUND

A subset of patients who underwent Fontan operations has two adequate-sized ventricles, but an anatomic biventricular circulation cannot be achieved because of complex morphology or for technical reasons. This study sought to determine whether these patients with two-ventricle Fontan circulation had superior outcomes compared with those with a single ventricle.

METHODS

A binational Fontan Registry of patients (n = 1,377) was analyzed to identify those patients with two adequate ventricles. This cohort was compared with patients with single-ventricle Fontan circulation. The primary end point was a composite end point called “Fontan failure” encompassing death, heart transplantation, Fontan takedown or conversion, protein-losing enteropathy, plastic bronchitis, or New York Heart Association functional class III or IV.

RESULTS

A total of 79 Fontan patients with two adequate ventricles (2V) were compared with 1,291 single ventricle (1V) Fontan patients. Median follow-up for the entire cohort was 11.5 years (interquartile range, 5.1 to 18.8 years). There was no difference in unadjusted 15-year freedom from Fontan failure (2V: 81% [95% confidence interval (CI), 69% to 94%] vs 1V: 86% [95% CI, 83% to 88%], P=0.4). Propensity-score matching for potential confounding factors yielded 75 two-ventricle Fontan patients matched with 604 single-ventricle Fontan patients, in which 15-year freedom from Fontan failure was also not different (2V: 79% [95% CI, 67% to 94%] vs 1V: 87% [95% CI, 84% to 91%], P=0.3).

CONCLUSIONS

The two-ventricle Fontan circulation does not have better outcomes compared with the single-ventricle Fontan circulation. Late outcomes may depend more on other characteristics of the Fontan circulation. This finding is relevant when the Fontan procedure is being considered as an alternative to anatomic repair in patients with complex two-ventricle morphologies.