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Guidelines ECS/EACTS de Revascularização Miocárdica Reforça Papel da Cirurgia como Preferência de Intervenção

2018 ESC/EACTS Guidelines on Myocardial Revascularization

The clinical practice guidelines on myocardial revascularization were released on August 25, 2018, by the ESC/EACTS, in collaboration with the EAPCI. Key messages:

- Myocardial revascularization is recommended for patients who have severe LV systolic dysfunction and coronary artery disease that is suitable for intervention.
- Coronary artery bypass grafting (CABG) is recommended as the first revascularization procedure in patients with multivessel disease who are of acceptable risk.
- CABG is recommended in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis >70%.
- Surgical aortic valve replacement (SAVR) is indicated in patients with severe aortic stenosis who are undergoing CABG or surgery of the ascending aorta or another valve.
- In patients undergoing CABG, carotid duplex ultrasonography is recommended in patients with a history of stroke or transient ischemic attack <6 months.
- Emergency coronary angiography is indicated in patients with acute coronary syndrome that is complicated by acute heart failure or cardiogenic shock.
- If left main or multivessel revascularization is being considered, calculate the SYNTAX score (Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery) to predict whether PCI can achieve similar benefits to CABG.
- The SYNTAX score is the recommended tool to gauge the anatomic complexity of coronary disease.
- Percutaneous coronary intervention (PCI) of the culprit lesion is the mainstay of ACS treatment.
- Drug-eluting stents (DES) are recommended instead to BMS for any PCI regardless of the clinical presentation, type of lesion, anticipated duration of dual antiplatelet therapy (DAPT), or anticoagulant therapy.
- For more complex disease, surgery provides better long-term survival.
- CABG and PCI have similar outcomes in less complex cases.
- In patients with diabetes, surgery is associated with better outcomes regardless of the complexity of the disease.
- CABG is preferred to achieve myocardial revascularization in patients with coronary artery disease, heart failure, and left ventricular ejection fraction ≤35%.
- In patients with a high degree of stenosis, radial artery grafts from the saphenous vein should be used. If open vein harvesting is used for CABG, the no-touch vein technique should be used.
- Consider PCI as an alternative to CABG, but the completeness of revascularization should be prioritized. Operator volume for left main PCI should be ≥25 cases/yr.
- If patients have taken metformin, check renal function immediately before angiography; withhold metformin if renal function deteriorates.
- Non–vitamin K oral anticoagulants should be given over vitamin K antagonists in patients with nonvalvular atrial fibrillation who require anticoagulation and antiplatelet treatment.
- In patients who have moderate or severe chronic kidney disease, preprocedural and postprocedural hydration with isotonic saline should be given if the expected contrast volume is expected to be >100 mL.

Recommendation for the type of revascularization in patients with stable coronary artery disease with suitable coronary anatomy for both procedures and low predicted surgical mortality[d]

Recommendations according to extent of CAD	CABG		PCI	
	Class[a]	Level[b]	Class[a]	Level[b]
One-vessel CAD				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis.[68,101,139–144]	I	A	I	A
Two-vessel CAD				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis.[68,70,73]	I	B	I	C
Left main CAD				
Left main disease with low SYNTAX score (0 - 22).[69,121,122,124,145–148]	I	A	I	A
Left main disease with intermediate SYNTAX score (23 - 32).[69,121,122,124,145–148]	I	A	IIa	A
Left main disease with high SYNTAX score (≥33).[c 69,121,122,124,146–148]	I	A	III	B
Three-vessel CAD without diabetes mellitus				
Three-vessel disease with low SYNTAX score (0 - 22).[102,105,121,123,124,135,149]	I	A	I	A
Three-vessel disease with intermediate or high SYNTAX score (>22).[c 102,105,121,123,124,135,149]	I	A	III	A
Three-vessel CAD with diabetes mellitus				
Three-vessel disease with low SYNTAX score 0–22.[102,105,121,123,124,135,150–157]	I	A	IIb	A
Three-vessel disease with intermediate or high SYNTAX score (>22).[c 102,105,121,123,124,135,150–157]	I	A	III	A

Seguimento de 10 anos do ART Trial falha em Demonstrar Superioridade do Uso de Duas Mamárias, na Cirurgia de Revascularização Miocárdica

ART - Randomised Comparison of Bilateral *Versus* Single Internal Thoracic Coronary Artery Bypass Graft Surgery: Effects on Mortality at Ten Years Follow-Up in the Arterial Revascularisation Trial (ART)

Surgeons expecting to see a win for bilateral internal-thoracic artery (ITA) grafts at the 10-year mark in the Arterial Revascularization Trial (ART) will be disappointed today.

A decade's worth of follow-up from the long-running study showed no difference between patients randomized to CABG surgery involving two ITA grafts instead of a single arterial graft, plus vein or radial artery grafts, for a composite primary endpoint of death, MI, or stroke. There also was no mortality in the intention-to-treat population.

For the primary endpoint, a composite of death, MI, and stroke, there were no differences between the single ITA and bilateral ITA groups at 10 years (HR 0.90; 95% CI 0.78-1.03). Nor was there any difference in 10-year survival, where the event curves were nearly superimposed throughout the follow-up period.

In additional analyses, however, which compared a single arterial graft strategy with a multiple arterial graft strategy—often a radial artery—mortality as a stand-alone endpoint was significantly reduced at 10 years with the multiple artery approach (HR 0.81; 95% CI 0.68-0.95), as was the primary composite endpoint (HR 0.80; 95% CI 0.69-0.93).

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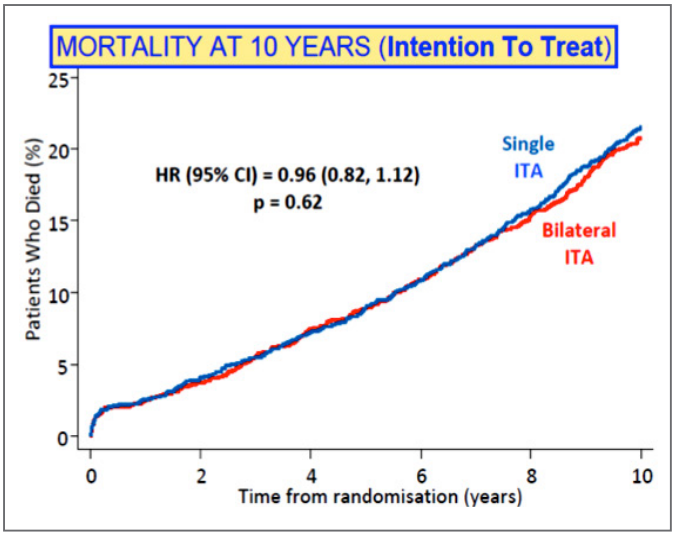
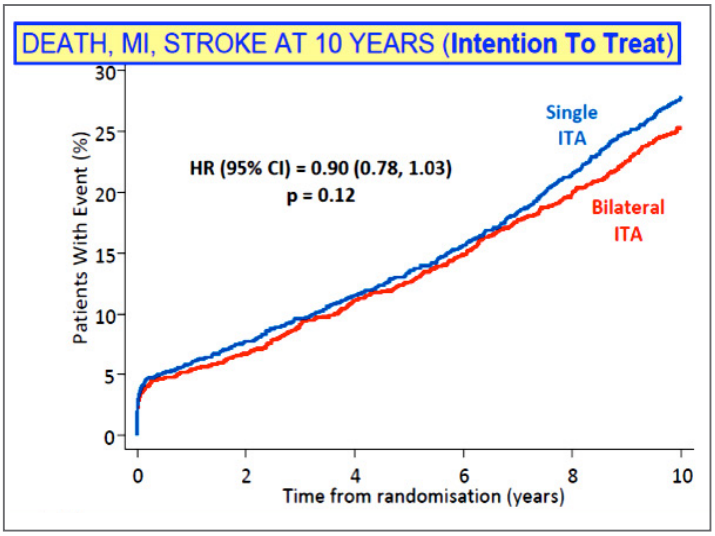




Resultados do MITRA-FR Trial não Aponta Benefício do MitraClip sobre o Tratamento Clínico, em Pacientes com IM Secundária a Insuficiência Cardíaca Grave

Percutaneous Repair or Medical Treatment for Secondary Mitral Regurgitation

BACKGROUND

In patients who have chronic heart failure with reduced left ventricular ejection fraction, severe secondary mitral-valve regurgitation is associated with a poor prognosis. Whether percutaneous mitral-valve repair improves clinical outcomes in this patient population is unknown.

METHODS

We randomly assigned patients who had severe secondary mitral regurgitation (defined as an effective regurgitant orifice area of >20 mm2 or a regurgitant volume of >30 ml per beat), a left ventricular ejection fraction between 15 and 40%, and symptomatic heart failure, in a 1:1 ratio, to undergo percutaneous mitral-valve repair in addition to receiving medical therapy (intervention group; 152 patients) or to receive medical therapy alone (control group; 152 patients). The primary efficacy outcome was a composite of death from any cause or unplanned hospitalization for heart failure at 12 months.

RESULTS

At 12 months, the rate of the primary outcome was 54.6% (83 of 152 patients) in the intervention group and 51.3% (78 of 152 patients) in the control group (odds ratio, 1.16; 95% confidence interval [CI], 0.73 to 1.84; P = 0.53). The rate of death from any cause was 24.3% (37 of 152 patients) in the intervention group and 22.4% (34 of 152 patients) in the control group (hazard ratio, 1.11; 95% CI, 0.69 to 1.77). The rate of unplanned hospitalization for heart failure was 48.7% (74 of 152 patients) in the intervention group and 47.4% (72 of 152 patients) in the control group (hazard ratio, 1.13; 95% CI, 0.81 to 1.56).

CONCLUSIONS

Among patients with severe secondary mitral regurgitation, the rate of death or unplanned hospitalization for heart failure at 1 year did not differ significantly between patients who underwent percutaneous mitral-valve repair in addition to receiving medical therapy and those who received medical therapy alone. (Funded by the French Ministry of Health and Research National Program and Abbott Vascular; MITRA-FR ClinicalTrials.gov number, NCT01920698.).

Table 3. Primary Outcome and Secondary Efficacy Outcomes at 12 Months (Intention-to-Treat Population).

Outcome	Intervention Group (N=152)	Control Group (N=152)	Hazard Ratio or Odds Ratio (95% CI)*	P Value†
Composite primary outcome: death from any cause or unplanned hospitalization for heart failure at 12 months — no. (%)	83 (54.6)	78 (51.3)	1.16 (0.73–1.84)	0.53
Secondary outcomes‡				
Death from any cause	37 (24.3)	34 (22.4)	1.11 (0.69–1.77)	
Cardiovascular death	33 (21.7)	31 (20.4)	1.09 (0.67–1.78)	
Unplanned hospitalization for heart failure	74 (48.7)	72 (47.4)	1.13 (0.81–1.56)	
Major adverse cardiovascular events§	86 (56.6)	78 (51.3)	1.22 (0.89–1.66)	

VERDICT Trial: a Estratégia De Angiografia Precoce (< 12 horas) Não Reduziu Mortalidade, em Pacientes Com IAM Sem Supra de Segmento ST

Early *Versus* Standard Care Invasive Examination and Treatment of Patients with Non-ST-Segment Elevation Acute Coronary Syndrome: The VERDICT Trial

BACKGROUND

The optimal timing of invasive coronary angiography (ICA) and revascularization in patients with non-ST-segment elevation acute coronary syndrome (NSTE-ACS) is not well defined. We tested the hypothesis, that a strategy of very early invasive coronary angiography (ICA) and possible revascularization within 12 hours of diagnosis, is superior to an invasive strategy performed within 48-72 hours in terms of clinical outcomes.

METHODS

Patients admitted with clinical suspicion of NSTE-ACS in the Capital Region of Copenhagen, Denmark were screened for inclusion in the VERDICT trial (ClinicalTrials.gov NCT02061891). Patients with ECG changes indicating new ischemia and/or elevated troponin, in whom ICA was clinically indicated and deemed logistically feasible within 12 hours, were randomized 1:1 to ICA within 12 hours or standard invasive care within 48-72 hours. The primary endpoint was a combination of all-cause death, non-fatal recurrent myocardial infarction, hospital admission for refractory myocardial ischemia or hospital admission for heart failure.

RESULTS

A total of 2147 patients were randomized; 1075 patients allocated to very early invasive whereas 1072 patients assigned to standard invasive care had ICA performed 61.6 hours after randomization. Among patients with significant coronary artery disease identified by ICA, coronary revascularization was performed in 88.4% (very early ICA) and 83.1% (standard invasive care) of the patients. Within a median follow-up time of 4.3 (IQR 4.1-4.4) years the primary endpoint occurred in 296 (27.5%) of participants in the very early ICA group and 316 (29.5%) in the standard care group (HR 0.92 [CI95 0.78-1.08]). Among patients with a GRACE risk score >140, a very early invasive treatment strategy improved the primary outcome compared with the standard invasive treatment (HR 0.81 95% CI 0.67-1.01, p-value for interaction = 0.023).

CONCLUSIONS

A strategy of very early invasive coronary evaluation does not improve overall long-term clinical outcome compared with an invasive strategy conducted within 2-3 days in patients with NSTE-ACS. However, in patients with the highest risk, very early invasive therapy improves long-term outcomes. CT Registration: URL: https://clinicaltrials.gov: NCT02061891.

What are the clinical implications

- Very early coronary evaluation, and intervention can safely be performed in NSTEMI patients with high-risk clinical features including dynamic ECG changes and/or cardiac troponin elevation.
- The findings of the VERDICT trial do not support an advantage of routine invasive strategy performed within less than 12 hours in all-comer patients compared with a more delayed invasive approach.
- In highest risk patients with a GRACE risk score >140 a very early invasive strategy improved clinical outcomes, a finding consistent with results from the TIMACS trial.

Subanálise Tardia do Estudo STICH Alerta para a Variabilidade de Resultados dos Exames para Viabilidade Miocárdica, em Pacientes Com Insuficiência Cardíaca Isquêmica

Variability in Ejection Fraction Measured By Echocardiography, Gated Single-Photon Emission Computed Tomography, and Cardiac Magnetic Resonance in Patients With Coronary Artery Disease and Left Ventricular Dysfunction

IMPORTANCE

Clinical decisions are frequently based on measurement of left ventricular ejection fraction (LVEF). Limited information exists regarding inconsistencies in LVEF measurements when determined by various imaging modalities and the potential impact of such variability.

OBJECTIVE

To determine the intermodality variability of LVEF measured by echocardiography, gated single-photon emission computed tomography (SPECT), and cardiovascular magnetic resonance (CMR) in patients with left ventricular dysfunction.

DESIGN, SETTING, AND PARTICIPANTS

International multicenter diagnostic study with LVEF imaging performed at 127 clinical sites in 26 countries from July 24, 2002, to May 5, 2007, and measured by core laboratories. Secondary study of clinical diagnostic measurements of LVEF in the Surgical Treatment for Ischemic Heart Failure (STICH), a randomized trial to identify the optimal treatment strategy for patients with LVEF of 35%or less and coronary artery disease. Data analysis was conducted from March 19, 2016, to May 29, 2018.

MAIN OUTCOMES AND MEASURES

At baseline, most patients had an echocardiogram and subsets of patients underwent SPECT and/or CMR. Left ventricular ejection fraction was measured by a core laboratory for each modality independent of the results of other modalities, and measurements were compared among imagingmethods using correlation, Bland-Altman plots, and coverage probability methods. Association of LVEF by each method and death was assessed.

RESULTS

A total of 2032 patients (mean [SD] age, 60.9 [9.6] years; 1759 [86.6%] male) with baseline LVEF data were included. Correlation of LVEF between modalities was r = 0.601 (for biplane echocardiography and SPECT [n = 385]), r = 0.493 (for biplane echocardiography and CMR [n = 204]), and r = 0.660 (for CMR and SPECT [n = 134]). Bland-Altman plots showed only moderate agreement in LVEF measurements from all 3 core laboratories with no substantial overestimation or underestimation of LVEF by any modality. The percentage of observations that fell within a range of 5% ranged from 43% to 54% between different imaging modalities.

CONCLUSIONS AND RELEVANCE

In this international multicenter study of patients with coronary artery disease and reduced LVEF, there was substantial variation between modalities in LVEF determination by core laboratories. This variability should be considered in clinical management and trial design.

Table 3. Agreement and Disagreement for LVEF 35% or Greater According to Echocardiographic Method and Imaging Modality Using LVEF by CMR as the Standard

Comparison LVEF	No. of Patients With Both LVEFs	No. (%) of Patients					
		Both EF ≤35%	Both EF >35%	2 EFs Agreed	CMR EF ≤35% and Comparison EF >35%	CMR EF >35% and Comparison EF ≤35%	2 EFs Disagreed
Echocardiographic EF	377	243 (64.5)	37 (9.8)	280 (74.3)	54 (14.3)	43 (11.4)	97 (25.7)
Echocardiographic biplane EF	204	134 (65.7)	18 (8.8)	152 (74.5)	34 (16.7)	18 (8.8)	52 (25.5)
Echocardiographic single-plane EF	130	80 (61.5)	17 (13.1)	97 (74.6)	18 (13.9)	15 (11.5)	33 (25.4)
Echocardiographic visual EF	375	271 (72.3)	25 (6.7)	296 (78.9)	24 (6.4)	55 (14.7)	79 (21.1)
SPECT EF	134	90 (67.1)	19 (14.2)	109 (81.3)	10 (7.5)	15 (11.2)	25 (18.7)

Abbreviations: CMR, cardiovascular magnetic resonance; EF, ejection fraction; LVEF, left ventricular ejection fraction; SPECT, single-photon emission computed tomography.

Registro STS/ACC Demonstra Superioridade da TAVI Valve-in-Valve, Sobre a Reoperação, em Pacientes Com Falência de Biopróteses Aórticas

Transcatheter Aortic Valve Replacement of Failed Surgically Implanted Bioprostheses. The STS/ACC Registry

BACKGROUND

Valve-in-valve (ViV) transcatheter aortic valve replacement (TAVR) has been shown to be feasible, yet the safety and efficacy in relation to native valve (NV) TAVR are not known.

OBJECTIVES

This study sought to evaluate the safety and effectiveness of ViV TAVR for failed surgical aortic valve replacement (SAVR) by comparing it with the benchmark of NV TAVR.

METHODS

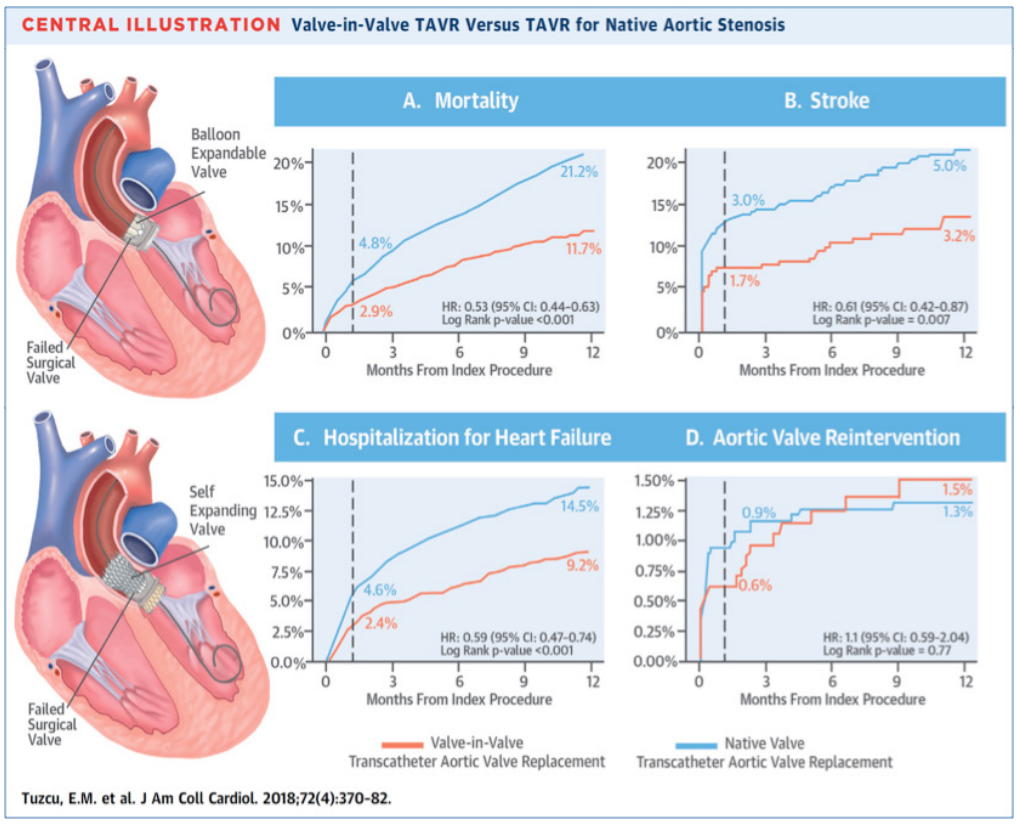
Patients who underwent ViV-TAVR (n ¼ 1,150) were matched 1:2 (on sex, high or extreme risk, hostile chest or porcelain aorta, 5-m-walk time, and Society of Thoracic Surgeons Predicted Risk of Mortality for reoperation) to patients undergoing NV-TAVR (n = 2,259). Baseline characteristics, procedural data, and in-hospital outcomes were obtained from the Transcatheter Valve Therapy Registry. The 30-day and 1-year outcomes were obtained from linked Medicare administrative claims data.

RESULTS

Unadjusted analysis revealed lower 30-day mortality (2.9% vs. 4.8%; p < 0.001), stroke (1.7% vs. 3.0%; p = 0.003), and heart failure hospitalizations (2.4% vs. 4.6%; p < 0.001) in the ViV-TAVR compared with NV-TAVR group. Adjusted analysis revealed lower 30-day mortality (hazard ratio: 0.503; 95% confidence interval: 0.302 to 0.839; p = 0.008), lower 1-year mortality (hazard ratio: 0.653; 95% confidence interval: 0.505 to 0.844; p = 0.001), and hospitalization for heart failure (hazard ratio: 0.685; 95% confidence interval: 0.500 to 0.939; p = 0.019) in the ViVTAVR group. Patients in the ViV-TAVR group had higher post-TAVR mean gradient (16 vs. 9 mm Hg; p < 0.001), but less moderate or severe aortic regurgitation (3.5% vs. 6.6%; p < 0.001). Post-TAVR gradients were highest in small SAVRs and stenotic SAVRs.

CONCLUSIONS

Comparison with the benchmark NV-TAVR shows ViV-TAVR to be a safe and effective procedure in patients with failed SAVR who are at high risk for repeat surgery.



Resultados Tardios da Correção da Interrupção de Arco Aórtico, Com Anastomose Direta ou Arterioplastia Com Patch

LongTerm Outcome of Interrupted Arch Repair With Direct Anastomosis and Homograft Augmentation Patch

BACKGROUND

This study analyzed outcomes of interrupted aortic arch (IAA) repair using a standardized technique to interpret the role of the arch repair on late outcomes in a complex and heterogeneous group of patients.

METHODS

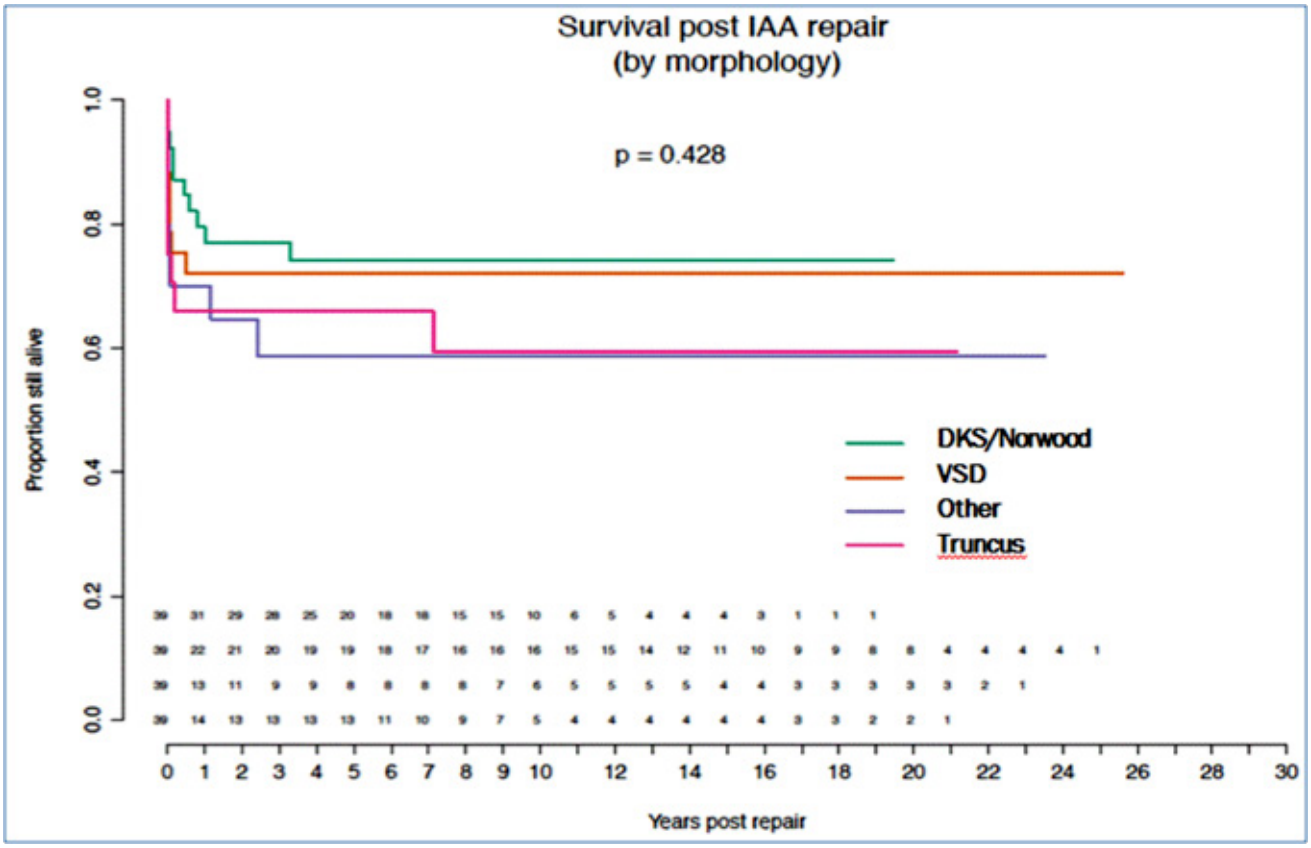
This single institution study covered the period from 1988 to 2015. A total of 120 cases of IAA were divided into four groups: IAA with ventricular septal defect (VSD) (n = 38), IAA with a Norwood or Damus-Kaye-Stansel procedure (n = 41), IAA with truncus arteriosus (n = 24), and a miscellaneous group (n =17). Arch repair was performed using a standard technique of direct anastomosis with homograftpatch augmentation.

RESULTS

IAAs were predominantly type B (n = 81, 68%), and type A (n = 34, 28%), with a significant association of type B with truncus arteriosus and of type A with an aortopulmonary window (p < 0.01). Survival was similar in all groups. The incidence of catheter or surgical reintervention was 18% (confidence interval [CI], 10% to 25%) at 5 years and 18% (CI, 10% to 25%) at 10 years, with catheter reintervention more common and occurring before 18 months. Surgical reintervention occurred in 7% (CI, 2% to 13%) at 5 and 10 years and at 10 years the reintervention rate was lower in the group with truncus arteriosus (0%) and in the group with a Norwood or Damus-Kaye-Stansel procedure (5%). There was no bronchial obstruction or aortic aneurysm. The Cox proportional hazard model showed that weight at surgery <2.5 kg and era of surgery were predictive of outcome, with surgical mortality rates in all variants dropping to 8.3% in the last 15 years of the study.

CONCLUSIONS

Repair of IAA using direct anastomosis and patch augmentation is applicable to all variants and provides good long-term arch patency. Survival is strongly associated with weight at surgery.



Resultados da Anastomose Cavo-Pulmonar Total em Pacientes Com Disfunção Ventricular

Outcomes of a Total Cavopulmonary Connection in Patients with Impaired Ventricular Function

BACKGROUND

Our aim was to evaluate outcomes following a total cavopulmonary connection (TCPC) in patients with preoperatively impaired ventricular function (VF).

METHODS

Of 483 consecutive TCPC patients, 44 (9.1%) had impaired VF (ejection fraction <50%, Group A), and 439 patients had normal VF (ejection fraction >50%, Group B). We compared the clinical outcomes between the groups.

RESULTS

The median age at TCPC was 2.8 (interquartile range 1.9–8.3) years in Group A and 2.3 (1.8–3.5) years in Group B (P = 0.025). Na atrioventricular valve (AVV) operation prior to (38.6 vs 27.1%, P < 0.001) and concomitant with (31.8 vs 12.1%, P < 0.001) the TCPC was performed more frequently in Group A. The median intensive care unit stay (7.0 vs 7.0 days, P = 0.737) and 30-day survival (97.7 vs 98.4%, P = 0.737) were not significantly different between groups. Freedom from death, transplantation (P = 0.115) and catheter intervention (P = 0.603) showed no difference between groups. However, freedom from cardiac reoperation was significantly lower in Group A (P < 0.001). VF was resolved in 22 of the 39 (56.4%) survivors in Group A. The recovered patients had a lower incidence of AVV reoperation (0 vs 6, P = 0.002) and pacemaker rhythm (0 vs. 5, P = 0.006).

CONCLUSIONS

In patients planned for TCPC, impaired VF is often associated with AVV regurgitation. TCPC can be performed with low risk and comparable clinical results except for cardiac reoperation in patients with impaired VF when compared to patients with normal VF. Following TCPC, VF recovers in half of the survivors. A competent AVV and sinus rhythm are prerequisites for recovery.

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