STS/EACTS Latin America Cardiovascular Surgery Conference
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OPTIONS IN AORTIC ARCH RECONSTRUCTION:

CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

Ricardo R Dias

ricardo.dias@incor.usp.br

The Society of Thoracic Surgeons

EACTS
European Association For Cardio-Thoracic Surgery

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

- No disclosure

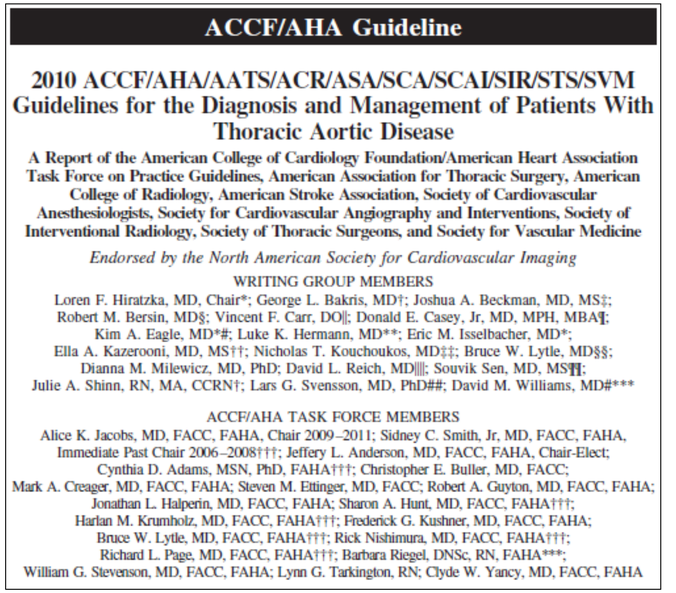
OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

SURGERY should be considered

- maximal diameter ≥ 55mm
- symptons
- signs of local compression

DECISION-MAKING about the procedure (weigh perioperative risk)

- partial or total arch replacement
- hibrid approach - FET
- arch vessel transposition and TEVAR



ACCF/AHA Guideline

2010 ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the Diagnosis and Management of Patients With Thoracic Aortic Disease

A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, American Association for Thoracic Surgery, American College of Radiology, American Stroke Association, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of Thoracic Surgeons, and Society for Vascular Medicine

Endorsed by the North American Society for Cardiovascular Imaging

WRITING GROUP MEMBERS

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European Heart Journal (2014) 35, 2873–2926
doi:10.1093/eurheartj/ehu281

ESC GUIDELINES

2014 ESC Guidelines on the diagnosis and treatment of aortic diseases

Document covering acute and chronic aortic diseases of the thoracic and abdominal aorta of the adult

The Task Force for the Diagnosis and Treatment of Aortic Diseases of the European Society of Cardiology (ESC)

Authors/Task Force members: Raimund Erbel* (Chairperson) (Germany), Victor Aboyans* (Chairperson) (France), Catherine Boileau (France), Eduardo Bossone (Italy), Roberto Di Bartolomeo (Italy), Holger Eggebrecht (Germany), Arturo Evangelista (Spain), Volkmar Falk (Switzerland), Herbert Frank (Austria), Oliver Gaemperli (Switzerland), Martin Grabenwöger (Austria), Axel Haverich (Germany), Bernard Iung (France), Athanasios John Manolis (Greece), Folkert Meijboom (Netherlands), Christoph A. Nienaber (Germany), Marco Roffi (Switzerland), Hervé Rousseau (France), Udo Sechtem (Germany), Per Anton Sirnes (Norway), Regula S. von Allmen (Switzerland), Christiaan J.M. Vrints (Belgium).

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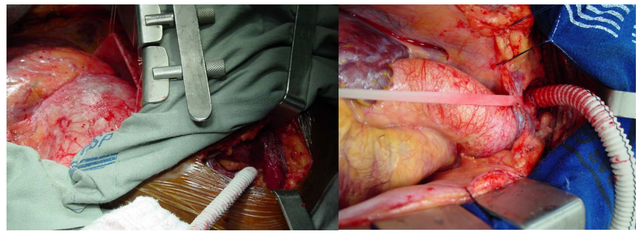
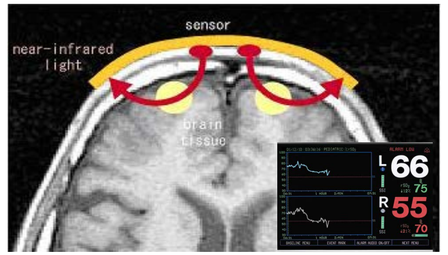
OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

Specific strategies lowered the inherent risk of aortic arch surgery - ANEURYSM / DISSECTION





- continuous antegrade cerebral perfusion
- assessment of transcranial oxigen saturation
- innovative arch prostheses
- moderate (25º-28ºC) rather than deep hypothermia
- the possibility of extensive repair of the aorta (ascending / arch / descending)

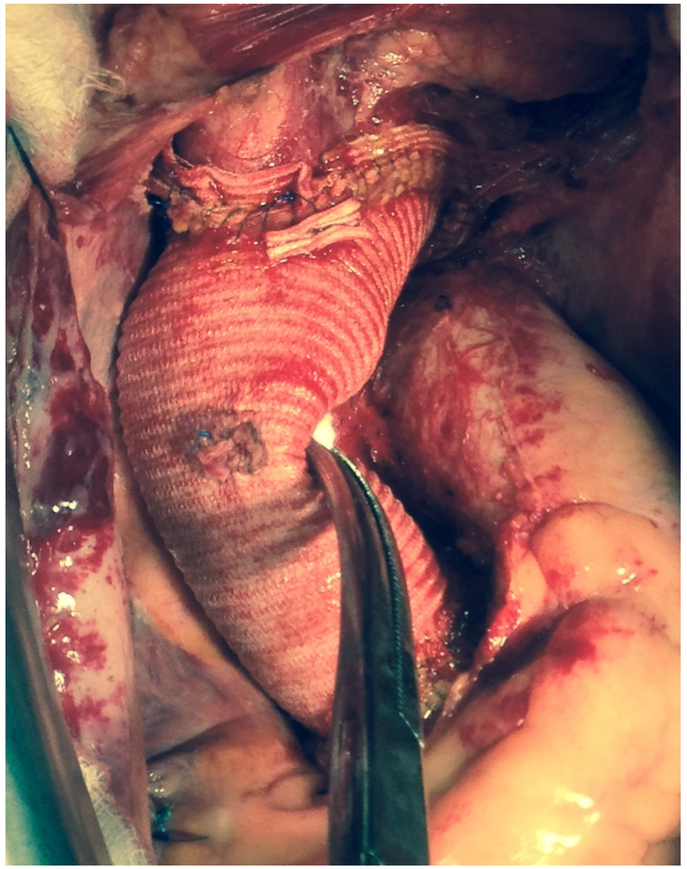
FET PROCEDURE

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

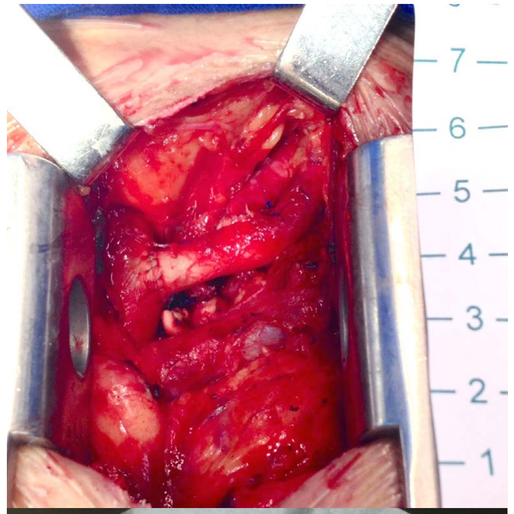
“...complex thoracic aortic pathology requires simplified solutions, or at least, as simple as possible...”

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

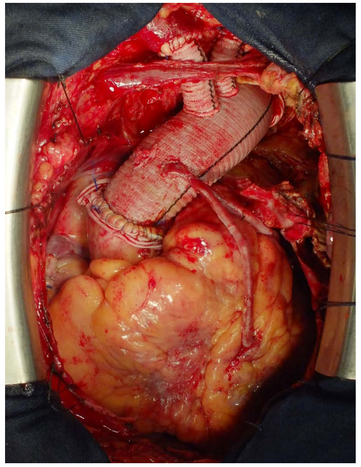
STRATEGY - AORTIC ARCH OPERATION

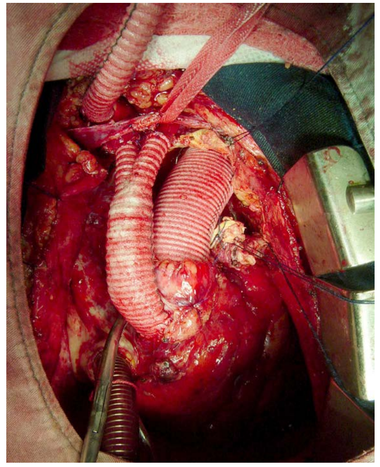


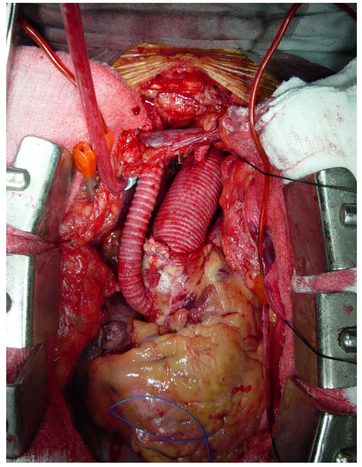
Proximal Arch - Ascending disease



TOTAL ARCH - ARCH DISEASE





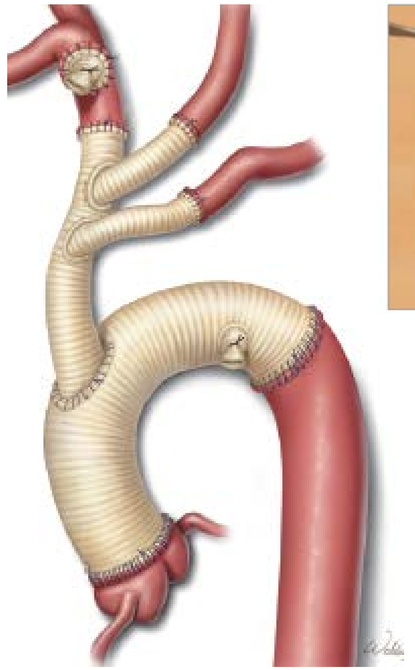


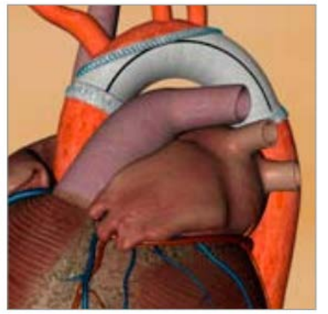
Distal Arch - Descending disease

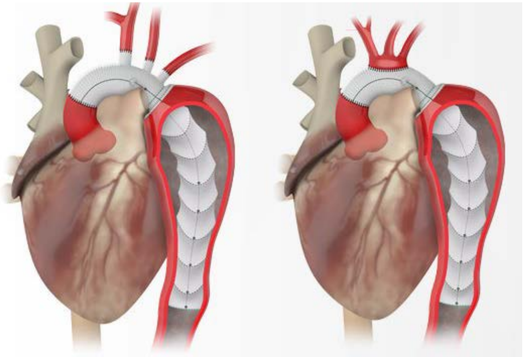
OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

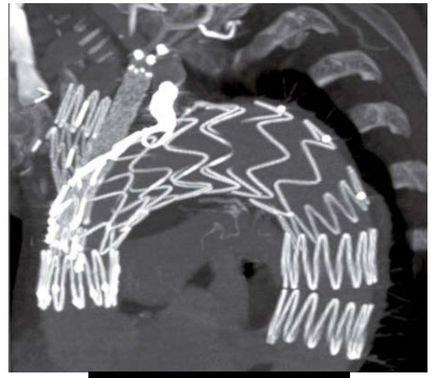
RECONSTRUCTION OF THE ARCH

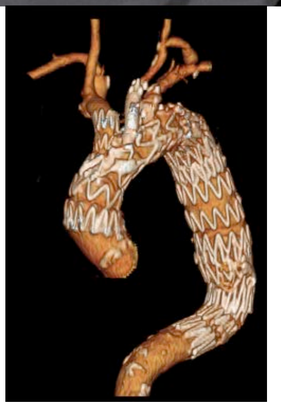
- location and / or extension of the disease
- diagnosis: aneurysm or dissection
- type of prosthesis available for use in your country











OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

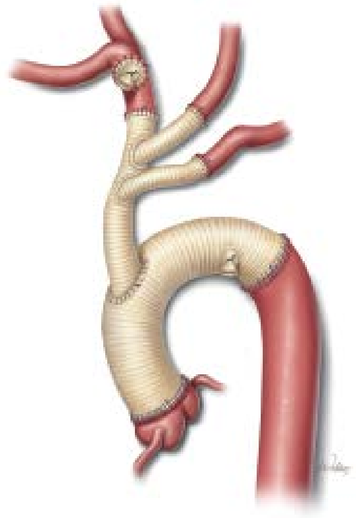
Aortic Arch Replacement With a Trifurcated Graft

David Spielvogel, MD, Christian D. Etz, MD, Daniel Silovitz, MS, Steven L. Lansman, MD, PhD, and Randall B. Griepp, MD

(Ann Thorac Surg 2007;83:S791–5)

Section of Cardiothoracic Surgery, New York College of Medicine, Westchester Medical Center, Valhalla, and Department of Cardiothoracic Surgery, Mount Sinai School of Medicine, New York, New York

150 patients
Hospital Mortality - 4,6%
CVA - 4%
Hemodialysis - 4,6%



Total aortic arch replacement: current approach using the trifurcated graft technique

Scott A. LeMaire[1,2], Scott A. Weldon[1,2], Joseph S. Coselli[1,2]

Ann Cardiothorac Surg 2013;2(3):347-352

[1]Division of Cardiothoracic Surgery, Michael E. DeBakey Department of Surgery, Baylor College of Medicine, Houston, Texas, USA; [2]Cardiovascular Surgery Service, The Texas Heart Institute at St. Luke's Episcopal Hospital, Houston, Texas, USA

Corresponding to: Scott A. LeMaire, MD. One Baylor Plaza, BCM 390, Houston, TX 77030, USA. Email: slemaire@bcm.edu.

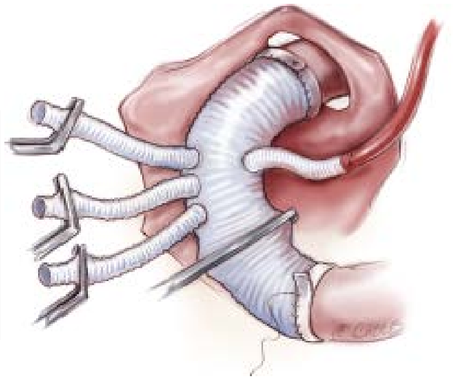
55 patients
Hospital Mortality - 2%
CVA - 5%
Hemodialysis - 5%

A study of brain protection during total arch replacement comparing antegrade cerebral perfusion versus hypothermic circulatory arrest, with or without retrograde cerebral perfusion: Analysis based on the Japan Adult Cardiovascular Surgery Database

J Thorac Cardiovasc Surg 2015;149:S65-73

Yutaka Okita, MD,[a] Hiroaki Miyata, PhD,[b] Noboru Motomura, MD,[c] and Shinichi Takamoto, MD,[d] The Japan Cardiovascular Surgery Database Organization

8169 patients
7038 - antegrade cer perfusion
Hospital Mortality - 6% vs 7,1%
CVA - 6,7% vs 8,6%
Hemodialysis - 3,9% vs 3,8%



OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

Frozen elephant trunk with total arch replacement for type A aortic dissections: Does acuity affect operative mortality?

Wei-Guo Ma, MD,[a,b,c] Jun Zheng, MD,[a,b] Wei Zhang, MD,[a] Kai Sun, MD, PhD,[b] Bulat A. Ziganshin, MD,[c] Long-Fei Wang, MD,[a] Rui-Dong Qi, MD,[a,b] Yong-Min Liu, MD,[a,b] Jun-Ming Zhu, MD,[a,b] Qian Chang, MD,[b] John A. Elefteriades, MD,[c] and Li-Zhong Sun, MD[a,b]

J Thorac Cardiovasc Surg 2014;148:963-72

803 patients

Hospital Mortality - 6,5%

CVA - 2%

Paraplegia - 2,4%

Hemodialysis - 3,4%

Long-term outcomes of frozen elephant trunk for type A aortic dissection in patients with Marfan syndrome

Wei-Guo Ma, MD, PhD,[a,b,c] Wei Zhang, MD,[a] Jun-Ming Zhu, MD,[a,b] Bulat A. Ziganshin, MD,[c] Ai-Hua Zhi, MD,[b] Jun Zheng, MD, PhD,[a,b] Yong-Min Liu, MD,[a,b] John A. Elefteriades, MD,[c] and Li-Zhong Sun, MD[a,b]

J Thorac Cardiovasc Surg 2017;■:1-15

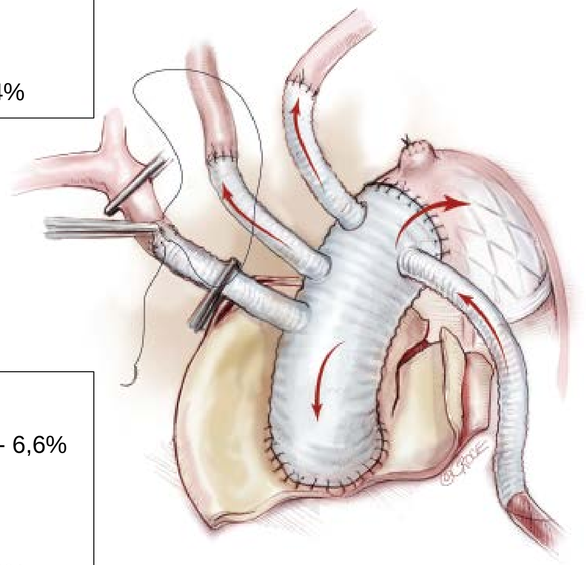
106 patients

Hospital Mortality - 6,6%

CVA - 0,9%

Paraplegia - 0,9%

Hemodialysis - 3,8%



OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

Total aortic arch replacement with a novel 4-branched frozen elephant trunk prosthesis: Single-center results of the first 100 patients

Malakh Shrestha, MBBS, Tim Kaufeld, MD, Erik Beckmann, MD, Felix Fleissner, MD, Julia Umminger, MD, Firas Abd Alhadi, MD, Dietmar Boethig, MD, Heike Krueger, RN, Axel Haverich, MD, and Andreas Martens, MD

J Thorac Cardiovasc Surg 2016;152:148-59

100 patients
Hospital Mortality - 7%
CVA - 9%
Paraplegia - 7%
Hemodialysis - 8%

Impact of clinical factors and surgical techniques on early outcome of patients treated with frozen elephant trunk technique by using EVITA open stent-graft: results of a multicentre study†

Sergey Leontyev[a,*], Konstantinos Tsagakis[b], Davide Pacini[c], Roberto Di Bartolomeo[c], Friedrich W. Mohr[a], Gabriel Weiss[d], Martin Grabenwoeger[d], Jorge G. Mascaro[e], Mauro Iafrancesco[e], Ulrich F. Franke[f], Nora Göbel[f], Thanos Sioris[g], Kazimierz Widenka[h], Carlos A. Mestres[i] and Heinz Jakob[b]

European Journal of Cardio-Thoracic Surgery 49 (2016) 660–666

509 patients
Hospital Mortality - 15,9%
CVA - 7,7%
Paraplegia - 7,5%
Hemodialysis - 4,1%

Aortic diameter remodelling after the frozen elephant trunk technique in aortic dissection: results from an international multicentre registry†

Mauro Iafrancesco[a,*,†], Nora Goebel[b,†], Jorge Mascaro[a], Ulrich F.W. Franke[b], Davide Pacini[c], Roberto Di Bartolomeo[c], Gabriel Weiss[d], Martin Grabenwöger[d], Sergey A. Leontyev[e], Friedrich-Wilhelm Mohr[e], Thanos Sioris[f], Heinz Jakob[g] and Konstantinos Tsagakis[g], on behalf of the International E-vita Open Registry Group

European Journal of Cardio-Thoracic Surgery 52 (2017) 310–318

383 patients
Hospital Mortality - 16,5%
CVA - 2,2%
Paraplegia - 3,6%
Hemodialysis - 19,1%

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

ACUTE TYPE A AORTIC DISSECTION - NEW PARADIGM ???

Presentation, Diagnosis, and Outcomes of Acute Aortic Dissection

17-Year Trends From the International Registry of Acute Aortic Dissection

Linda A. Pape, MD,* Mazen Awais, MD,†‡ Elise M. Woznicki, BS,† Toru Suzuki, MD, PhD,§ Santi Trimarchi, MD, PhD,‖ Arturo Evangelista, MD,¶ Truls Myrmel, MD, PhD,# Magnus Larsen, MD,# Kevin M. Harris, MD,** Kevin Greason, MD,†† Marco Di Eusanio, MD, PhD,‡‡ Eduardo Bossone, MD, PhD,§§ Daniel G. Montgomery, BS,† Kim A. Eagle, MD,† Christoph A. Nienaber, MD,‖‖ Eric M. Isselbacher, MD,¶¶ Patrick O'Gara, MD##

ABSTRACT

BACKGROUND Diagnosis, treatment, and outcomes of acute aortic dissection (AAS) are changing.

OBJECTIVES This study examined 17-year trends in the presentation, diagnosis, and hospital outcomes of AAD from the International Registry of Acute Aortic Dissection (IRAD).

METHODS Data from 4,428 patients enrolled at 28 IRAD centers between December 26, 1995, and February 6, 2013, were analyzed. Patients were divided according to enrollment date into 6 equal groups and by AAD type: A (n = 2,952) or B (n = 1,476).

RESULTS There was no change in the presenting complaints of severe or worst-ever pain for type A and type B AAD (93% and 94%, respectively), nor in the incidence of chest pain (83% and 71%, respectively). Use of computed tomography (CT) for diagnosis of type A increased from 46% to 73% ($p < 0.001$). Surgical management for type A increased from 79% to 90% ($p < 0.001$). Endovascular management of type B increased from 7% to 31% ($p < 0.001$). Type A in-hospital mortality decreased significantly (31% to 22%; $p < 0.001$), as surgical mortality (25% to 18%; $p = 0.003$). There was no significant trend in in-hospital mortality in type B (from 12% to 14%).

CONCLUSIONS Presenting symptoms and physical findings of AAD have not changed significantly. Use of chest CT increased for type A. More patients in both groups were managed with interventional procedures: surgery in type A and endovascular therapy in type B. A significant decrease in overall in-hospital mortality was seen for type A but not for type B. (J Am Coll Cardiol 2015;66:350–8) © 2015 by the American College of Cardiology Foundation.

A Meta-Analysis of Total Arch Replacement With Frozen Elephant Trunk in Acute Type A Aortic Dissection

Hisato Takagi[1], and Takuya Umemoto[1]; for the ALICE[2] Group

Vascular and Endovascular Surgery
2016, Vol. 50(1) 33-46

DOI: 10.1177/1538574415624767
ves.sagepub.com
SAGE

Abstract

Objectives: To assess the safety and efficacy, we performed a meta-analysis of total arch replacement with frozen elephant trunk in exclusive acute type A (neither chronic nor type B) aortic dissection. **Methods:** Databases including MEDLINE and EMBASE were searched through March 2015 using Web-based search engines (PubMed and OVID). Eligible studies were case series of frozen elephant trunk enrolling patients with acute type A (neither chronic nor type B) aortic dissection reporting at least early (in-hospital or 30-day) all-cause mortality. Study-specific estimates were combined in both fixed- and random-effect models. **Results:** Fifteen studies enrolling 1279 patients were identified and included. Pooled analyses demonstrated the cardiopulmonary bypass time of 207.1 (95% confidence interval [CI], 186.1-228.1) minutes, aortic cross-clamp time of 123.3 (95% CI, 113.1-133.5) minutes, selective antegrade cerebral perfusion time of 49.3 (95% CI, 37.6-61.0) minutes, hypothermic circulatory arrest time of 39.0 (95% CI, 30.7-47.2) minutes, early mortality of 9.2% (95% CI, 7.7-11.0%), stroke of 4.8% (95% CI, 2.5-9.0%), spinal cord injury of 3.5% (95% CI, 1.9-6.6%), mid- to long-term (≥1-year) overall mortality of 13.0% (95% CI, 10.4-16.0%), reintervention of 9.6% (95% CI, 5.6-15.8%), and false lumen thrombosis of 96.8% (95% CI, 90.7-98.9%). **Conclusions:** Total arch replacement with frozen elephant trunk provides a safe alternative to that with conventional elephant trunk in patients with acute type A aortic dissection, with acceptable early mortality and morbidity. The rates of mid- to long-term reintervention and false lumen non-thrombosis may be lower in patients undergoing the frozen than conventional elephant trunk procedure.

Interactive CardioVascular and Thoracic Surgery (2016) 1–10
doi:10.1093/icvts/ivw355

STATE-OF-THE-ART

Cite this article as: Smith HN, Boodhwani M, Ouzounian M, Saczkowski R, Gregory AJ, Herget EJ, et al. Classification and outcomes of extended arch repair for acute Type A aortic dissection: a systematic review and meta-analysis*. Interact CardioVasc Thorac Surg 2016; doi:10.1093/icvts/ivw355.

Classification and outcomes of extended arch repair for acute Type A aortic dissection: a systematic review and meta-analysis†

Holly N. Smith, Munir Boodhwani, Maral Ouzounian, Richard Saczkowski, A
Eric J. Herget and Jehangir J. Appoo*

University of Calgary, Calgary, Canada

* Corresponding author. 1403 29th Street NW, Foothills Medical Centre, Room C820, Calgary, AB T2N 2T9, Canada. Tel: +1-4
e-mail: Jehangir.appoo@albertahealthservices.ca (Jehangir J. Appoo).

Received 1 March 2016; received in revised form 27 July 2016; accepted 16 September 2016

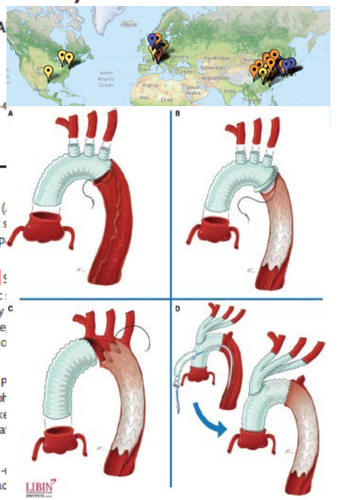
Summary

OBJECTIVES: Distal extent of repair in patients undergoing surgery for acute Type A aortic dissection (
hybrid techniques involving open and endovascular surgery have been reported in small numbers by s
atic review and meta-analysis was performed to investigate the outcomes following extended arch rep
tem is proposed of the different techniques to facilitate discussion and further investigation.

METHODS: Using Ovid MEDLINE 38 studies were identified reporting outcomes for 2140 patients,
groups on the basis of extent of surgical aortic resection and the method of descending thoracic aortic
culatory arrest (frozen stented elephant trunk) or with normothermic perfusion and use of fluoroscopy
arch replacement, (II) total arch and frozen stented elephant trunk, (III) hemiarch and frozen stented ele
warm stent graft. Perioperative event rates were obtained for each of the four groups and the entire c
mates. Linearized rates of late mortality and reoperation were calculated.

RESULTS: Overall pooled hospital mortality for extended arch techniques was 8.6% (95% CI 7.2–10.0). P
technique resulted in hospital mortality of 11.9% for total arch, 8.6% total arch and frozen stented elep
zen stented elephant trunk and 5.5% total arch and warm stent graft. Overall incidence of stroke
(95% CI 3.6–8.2). Rate of spinal cord ischaemia was 2.0% (95% CI 1.2–3.0). Pooled linearized rate of la
CI 1.34–2.07) with linearized rate of re-operation of 1.62%/pt-yr (95% CI 1.24–2.05).

CONCLUSIONS: Perioperative results of extended arch procedures are encouraging. Further follow-
complications are reduced with these emerging techniques. The proposed classification system will fac
and long-term results of different techniques of extended arch repair for ATAAD.



OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

ACUTE TYPE A AORTIC DISSECTION - NEW PARADIGM ???

Hemiarch versus total aortic arch replacement in acute type A dissection: a systematic review and meta-analysis

Shi Sum Poon, Thomas Theologou, Deborah Harrington, Manoj Kuduvalli, Aung Oo, Mark Field

Thoracic Aortic Aneurysm Service, Department of Cardiac Surgery, Liverpool Heart and Chest Hospital, Liverpool, UK
Correspondence to: Mark Field. Thoracic Aortic Aneurysm Service, Department of Cardiac Surgery, Liverpool Heart and Chest Hospital, Drive, Liverpool, L14 3PE, UK. Email: mark.field@lhch.nhs.uk.

Background: Despite recent advances in aortic surgery, acute type A aortic dissection remains a surgical emergency associated with high mortality and morbidity. Appropriate management is crucial to achieve satisfactory outcomes but the optimal surgical approach is controversial. The present systematic review and meta-analysis sought to access cumulative data from comparative studies between hemiarch and total aortic arch replacement in patients with acute type A aortic dissection.

Methods: A systematic review of the literature using six databases. Eligible studies include comparative studies on hemiarch versus total arch replacement reporting short, medium and long term outcomes. A meta-analysis was performed on eligible studies reporting outcome of interest to quantify the effects of hemiarch replacement on mortality and morbidity risk compared to total arch replacement.

Result: Fourteen retrospective studies met the inclusion criteria and 2,221 patients were included in the final analysis. Pooled analysis showed that hemiarch replacement was associated with a lower risk of post-operative renal dialysis [risk ratio (RR) =0.72; 95% confidence interval (CI): 0.56–0.94; P=0.02; I^2=0%]. There was no significant difference in terms of in-hospital mortality between the two groups (RR =0.84; 95% CI: 0.65–1.09; P=0.20; I^2=0%). Cardiopulmonary bypass, aortic cross clamp and circulatory arrest times were significantly longer in total arch replacement. During follow up, no significant difference was reported from current studies between the two operative approaches in terms of aortic re-intervention and freedom from aortic reoperation.

Conclusions: Within the context of publication bias by high volume aortic centres and non-randomized data sets, there was no difference in mortality outcomes between the two groups. This analysis serves to demonstrate that for those centers doing sufficient total aortic arch activity to allow for publication, excellent and equivalent outcomes are achievable. Conclusions on differences in longer term outcome data are required. We do not, however, advocate total arch as a primary approach by all centers and surgeons irrespective of patient characteristics, but rather, a tailored approach based on surgeon and center experience and patient presentation.

Keywords: Hemiarch replacement; total arch replacement; acute type A dissection; meta-analysis

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Proximal aortic repair versus extensive aortic repair in the treatment of acute type A aortic dissection: a meta-analysis

Yan Yan[a,†], Li Xu[a,†], Hao Zhang[a,†], Zhi-Yun Xu[a,*], Xue-Yan Ding[b], Shu-Wei Wang[c], Xiang Xue[a] and Meng-Wei Tan[a,*]

[a] Department of Cardiothoracic Surgery, Changhai Hospital, Second Military Medical University, Shanghai, China
[b] Cardiovascular Therapeutic Centre, The 117 Hospital of the Chinese People's Liberation Army, Hangzhou, Zhejiang, China
[c] Department of Cardiothoracic Surgery, The 153 Hospital of the Chinese People's Liberation Army, Zhengzhou, Henan, China

* Corresponding author. Department of Cardiothoracic Surgery, Changhai Hospital, Second Military Medical University, 168 Changhai Road, Shanghai 200433, China. Tel: +86-21-31161768; fax: +86-21-65490979; e-mail: tmengweismmu@163.com (M.-W. Tan).

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Abstract

OBJECTIVES: The optimal surgical strategy for acute type A aortic dissection (ATAAD) is still controversial because of the inconsistent or even conflicting results of proximal aortic repair (PR) versus extensive aortic repair (ER) on early and late prognostic outcomes. This meta-analysis pooled data from all available studies of PR versus ER to get a summarized conclusion.

METHODS: Studies were identified by searching the Medline, EMBASE and Cochrane databases. Early and late prognostic outcomes of interest were evaluated with meta-analysis. Fixed- or random-effect models were used according to the significance of heterogeneity. Robustness of pooled estimates and the source of heterogeneity were assessed via sensitivity analyses and meta-regression, respectively. Publication bias was evaluated by the funnel plot and Egger's test.

RESULTS: Nine studies with a total of 1872 patients were included for the meta-analysis. Pooled results indicated that, when compared with the ER procedure, PR was associated with lower early mortality [risk ratio (RR) = 0.69, 95% confidence interval (CI) 0.54–0.90, $P = 0.005$] but higher incidence of postoperative aortic events including reoperation of the distal aorta (RR = 3.14, 95% CI 1.74–5.67, $P < 0.001$). PR and ER demonstrated analogous prognosis on long-term mortality (HR = 1.02, 95% CI 0.51–2.06, $P = 0.96$) and the incidences of early postoperative renal failure (RR = 0.75, 95% CI 0.49–1.14, $P = 0.17$) and stroke (RR = 0.73, 95% CI 0.30–1.78, $P = 0.50$). All the pooled results were robust to sensitivity analysis. Heterogeneity was insignificant except for the meta-analysis of late mortality.

CONCLUSIONS: Performing a less aggressive initial surgical procedure of PR in ATAAD patients would have lower early mortality but elevated incidence rates of late aortic reintervention, when compared with ER. Other prognostic results of the two surgical strategies including long-term mortality were similar for both.

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Review

State-of-the-Art Surgical Management of Acute Type A Aortic Dissection

tic or branch artery procedure) should be considered. The 2016 Canadian multidisciplinary guidelines on Thoracic Aortic Intervention suggest that an extended distal arch technique be considered for patients who present with ATAAD and one of the following characteristics [1, 57]:

a. Primary intimal entry tear in the descending aorta
b. Significant aneurysmal disease of the arch
c. Concomitant descending thoracic aortic aneurysm
d. Distal malperfusion
e. Young patients
f. Patients with known connective tissue disorders

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

Aortic Disease → 30ª death ranking State of Sao Paulo, 18.042 deaths (98-06)

causes	AMI	Pneumonia	CVA	Gunshot	DM	Heart Failure	Cardiomyopathy	Car Acident	Breast CA	Prostate CA	AORTIC DISEASE
Ranking	1º	2º	3º	5º	6º	8º	12º	14º	18º	23º	30º
nº de óbitos	177.484	111.427	80.952	76.691	75.428	64.479	40.251	35.962	28.496	26.941	18.042

- TAD → 9.465 deaths (Jan 1998 to Dez 2007)
  - confirmed diagnosis after death - 8.167 patients (86,3%)
  - 6.721 acute dissection (ICD I71.0) → 71%
  - 2.744 thoracic aortic aneurysm (ICD I71.1; I71.2; I71.5; I71.6) → 29%
- TAD → 6.109 hospitalizations SUS
- TAD → 3.572 aortic surgeries (58,5% total patients)

HOSPITAL MORTALITY → 1.298 pacientes (21,2%)

Dias RR. Arq Bras Cardiol 2013;101(6):528-35

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

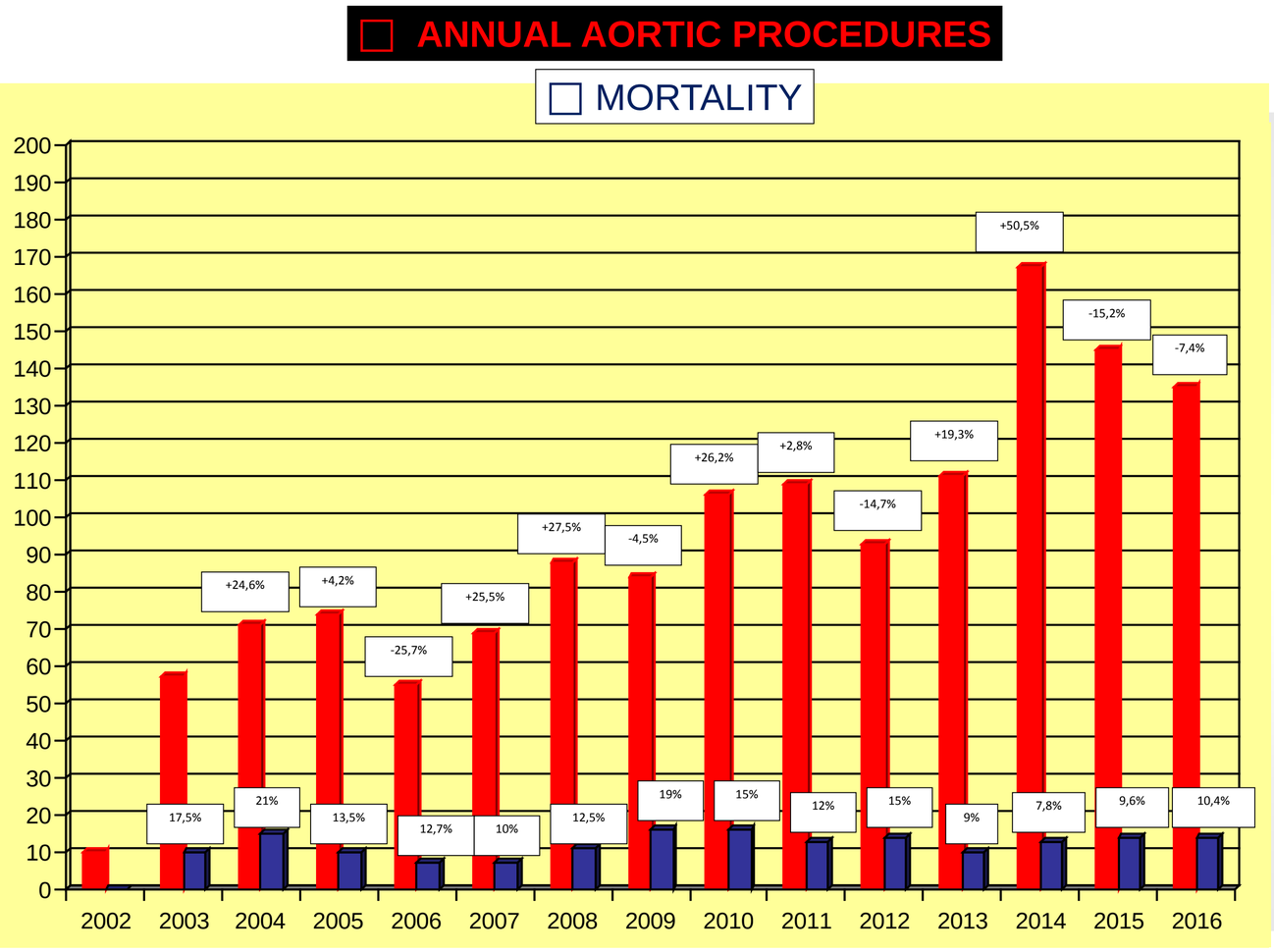
OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

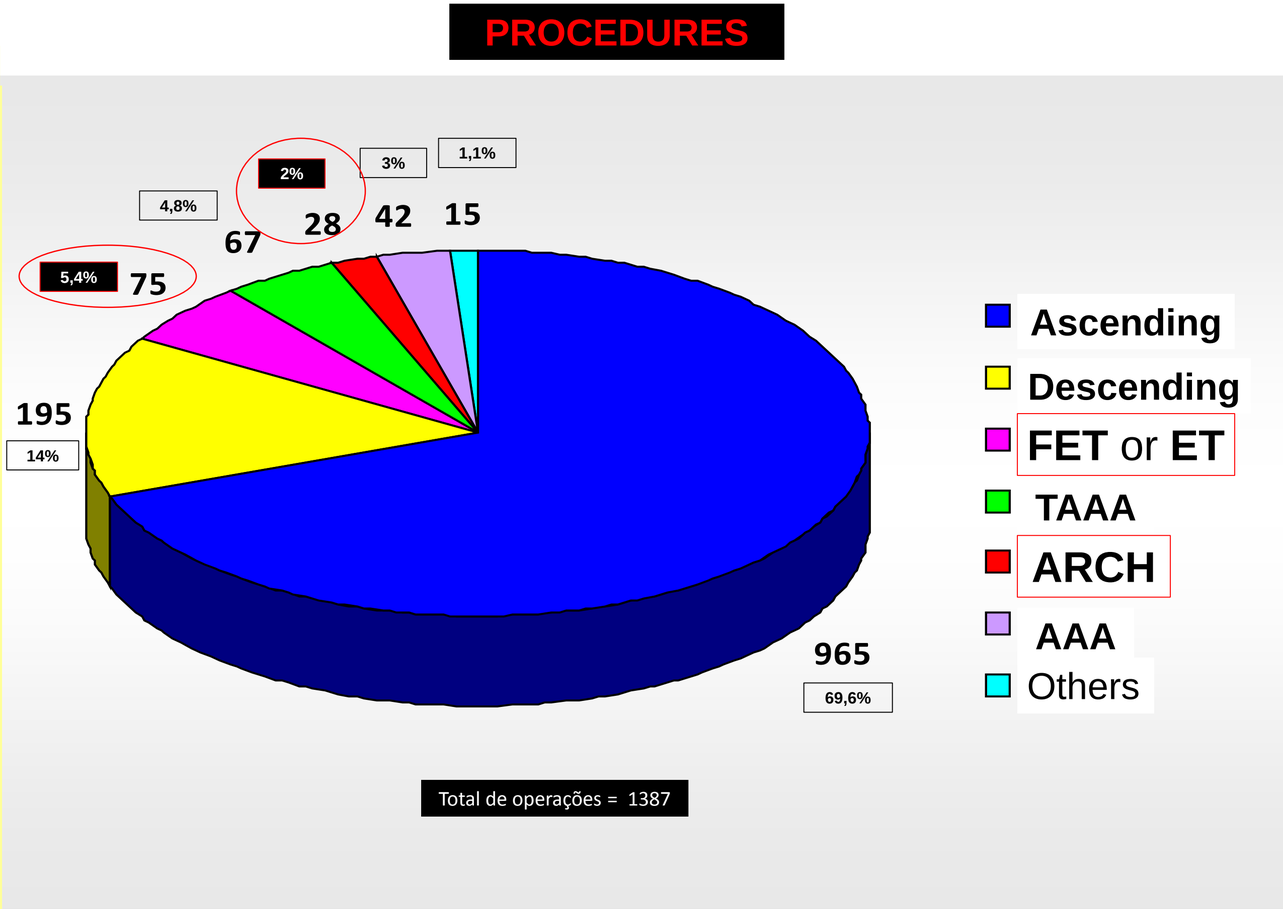
Clinical Hospital - 1944
Over 2.000 beds
Over 15.000 employees


Sao Paulo Medical School - 1912

Heart Institute - 1977 - 503 beds
Over 2.000 open cardiovascular surgeries / year

OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

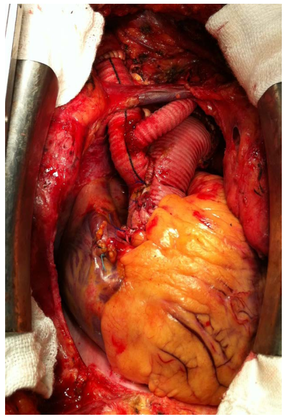




OPTIONS IN AORTIC ARCH RECONSTRUCTION: CONVENTIONAL vs. FROZEN ELEPHANT TRUNK

FROZEN ELEPHANT TRUNK PROCEDURES 2009 - 2017

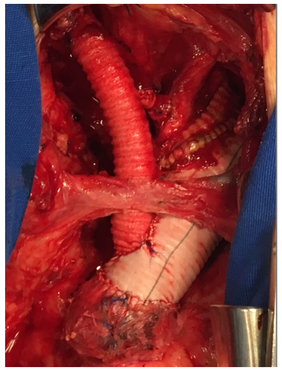
TOTAL = 61 PATIENTS —— HOSPITAL MORTALITY = 10 PATIENTS (16,4%)



- cause for first operation
  - 7% (4 pat) - Acute type A dissection
  - 69% (42 pat) - Chronic type A/B disssection
  - 24% (15 pat) - Aneurysm

30% reoperations

36% associated procedures [7% RM + 17% TVAo + 13% composite mechanical graft (Bentall/Cabrol)]



- Second-stage intervention
  - Endovascular TEVAR - 5 patients
  - Open thoracoabdominal repair - 4 patients (1 death)

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Thank you !

ricardo.dias@incor.usp.br

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