Aortic dissection: Where is the important focus during first days/weeks?

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ENDOVASCULAR STENT-GRAFT PLACEMENT FOR THE TREATMENT OF ACUTE AORTIC DISSECTION

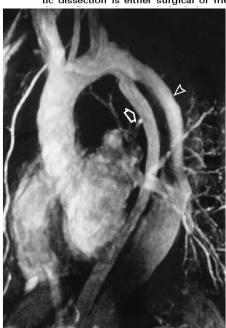
MICHAEL D. DAKE, M.D., NORIYUKI KATO, M.D., R. SCOTT MITCHELL, M.D., CHARLES P. SEMBA, M.D., MAHMOOD K. RAZAVI, M.D., TAKATSUGU SHIMONO, M.D., TADANORI HIRANO, M.D., KAN TAKEDA, M.D., ISAO YADA, M.D., AND D. CRAIG MILLER, M.D.

ABSTRACT

Background The standard treatment for acute aortic dissection is either surgical or medical therapy,



CUTE aortic dissection is one of the most catastrophic diseases that can affect the aorta. There are 10 to 20 cases per million





- Feasible
- Safe
- Quick recovery
- Open surgery abandoned

Are we now in the era where medical management of acute TBAD is abandoned?

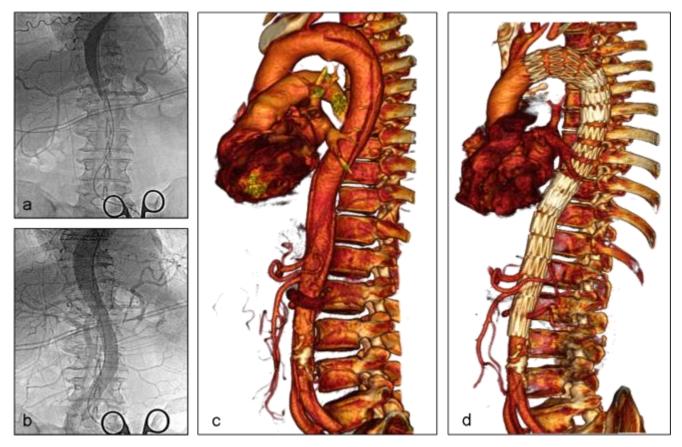
Dake MD, et al. NEJM 1999; 340:1546-1552 Nienaber CA, Fattori R, Lund G, et al. NEJM 1999; 340:1539-1545

The important areas to focus on during early period

- Stabilise
- Save life & limb
- Diagnose (entry & extent)
- Analyse risk (intervention v no intervention)
- Intervene (Timely and directed)

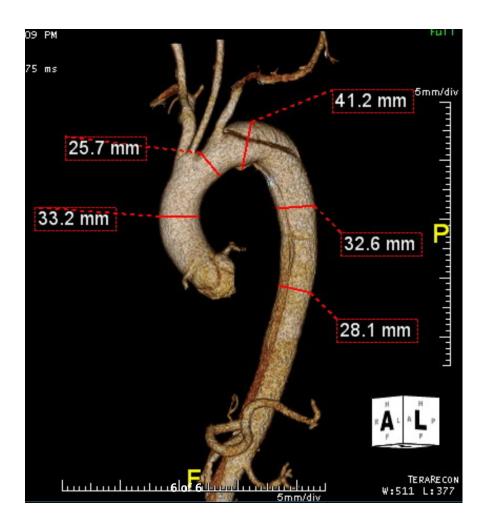


High risk (complicated) group: Lower body malperfusion (ESC IC)



Malperfusion syndrome treated with endovascular stent-graft and PETTICOAT; a) angiography of lower body malperfusion; b) reperfusion after proximal stent-graft; c) 3D CT reconstruction of acute complicated dissection with malperfusion; d) reconstructed aorta and abolished malperfusion after stent-graft and PETTICOAT.

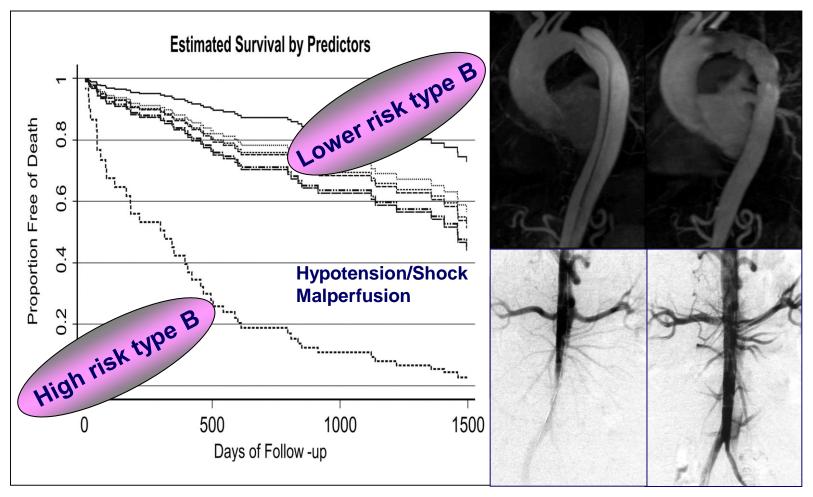








Type B aortic dissection: Survival and predictors

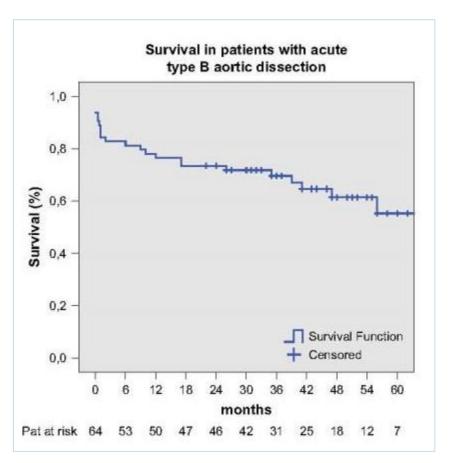


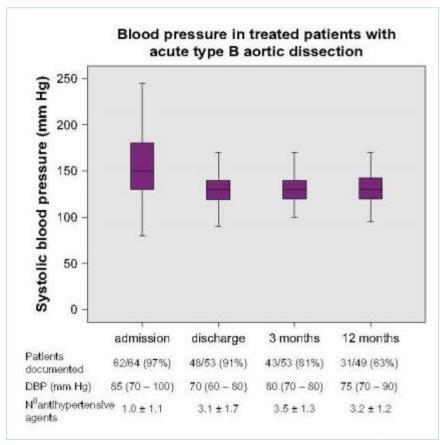
Tsai T, Nienaber C, et al. Circulation 2006, 114:2226-2231





Survival with acute type B aortic dissection on drugs....









INSTEAD-XL

Peripheral Artery Disease

Endovascular Repair of Type B Aortic Dissection Long-term Results of the Randomized Investigation of Stent Grafts in Aortic Dissection Trial

Christoph A. Nienaber, MD, PhD; Stephan Kische, MD; Hervé Rousseau, MD, PhD; Holger Eggebrecht, MD; Tim C. Rehders, MD; Guenther Kundt, MD, PhD; Aenne Glass, MA; Dierk Scheinert, MD, PhD; Martin Czerny, MD, PhD; Tilo Kleinfeldt, MD; Burkhart Zipfel, MD; Louis Labrousse, MD; Rossella Fattori, MD, PhD; Hüseyin Ince, MD, PhD; for the INSTEAD-XL trial

Background—Thoracic endovascular aortic repair (TEVAR) represents a therapeutic concept for type B aortic dissection.
Long-term outcomes and morphology after TEVAR for uncomplicated dissection are unknown.

Methods and Results—A total of 140 patients with stable type B aortic dissection previously randomized to optimal medical treatment and TEVAR (n=72) versus optimal medical treatment alone (n=68) were analyzed retrospectively for aortaspecific, all-cause outcomes, and disease progression using landmark statistical analysis of years 2 to 5 after index procedure. Cox regression was used to compare outcomes between groups; all analyses are based on intention to treat. The risk of all-cause mortality (11.1% versus 19.3%; P=0.13), aorta-specific mortality (6.9% versus 19.3%; P=0.04), and progression (27.0% versus 46.1%; P=0.04) after 5 years was lower with TEVAR than with optimal medical treatment alone. Landmark analysis suggested a benefit of TEVAR for all end points between 2 and 5 years; for example, for all-cause mortality (0% versus 16.9%; P=0.0003), aorta-specific mortality (0% versus 16.9%; P=0.0005), and for progression (4.1% versus 28.1%; P=0.004); Landmarking at 1 year and 1 month revealed consistent findings. Both improved survival and less progression of disease at 5 years after elective TEVAR were associated with stent graft induced false lumen thrombosis in 90.6% of cases (P<0.0001).

Conclusions—In this study of survivors of type B aortic dissection, TEVAR in addition to optimal medical treatment is associated with improved 5-year aorta-specific survival and delayed disease progression. In stable type B dissection with suitable anatomy, preemptive TEVAR should be considered to improve late outcome.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT01415804. (Circ Cardiovasc Interv. 2013;6:407-416.)

Key Words: aortic dissection ■ aortic remodeling ■ prognosis ■ stent graft





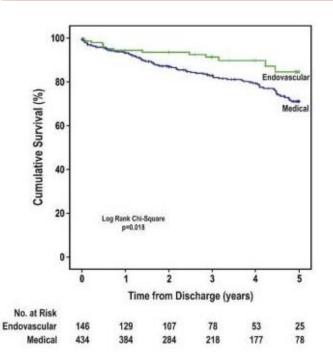
IRAD experience with TEVAR

Survival After Endovascular Therapy in Patients With Type B Aortic Dissection

A Report From the International Registry of Acute Aortic Dissection (IRAD)

Rossella Fattori, MD,* Daniel Montgomery, BS,† Luigi Lovato, MD,‡ Stephan Kische, MD,§ Marco Di Eusanio, MD,† Hüseyin Ince, MD,§ Kim A. Eagle, MD,† Eric M. Isselbacher, MD,|| Christoph A. Nienaber, MD§

Pesaro and Bologna, Italy; Ann Arbor, Michigan; Rostock, Germany; and Boston, Massachusetts



China: TEVAR for stable dissection

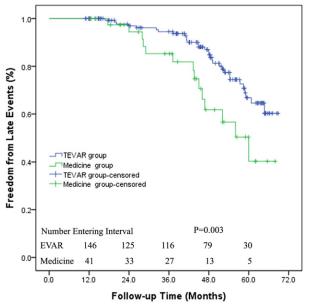
CLINICAL RESEARCH

Treatment of Acute Type-B Aortic Dissection

Thoracic Endovascular Aortic Repair or Medical Management Alone?

Yong-Lin Qin, MD,* Gang Deng, MD,* Tian-Xiao Li, MD,† Weiping Wang, MD,‡ Gao-Jun Teng, MD*

Nanjing and Zhengzhou, China; and Cleveland, Ohio

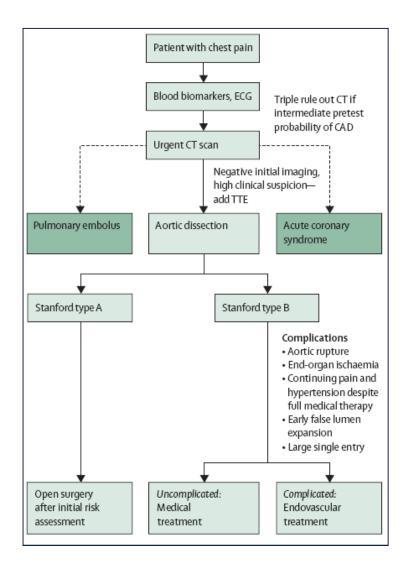


Kaplan-Meier Curves of Freedom From Late Events After TEVAR of Type-B AAD Patients were subdivided into 2 groups (thoracic endovascular aortic repair [TEVAR] group vs. medicine group), and the cumulative freedom from all post-procedure events was analyzed. AAD acute aortic dissection





Acute Aortic Dissection Therapy 2016











ESC guidelines 2014

Recommended treatment of aortic dissection

Recommendations	Class	Level
In all patients with AD, medical therapy including pain relief and blood pressure control is recommended.		С
In patients with type A AD, urgent surgery is recommended.		В
In patients with acute type A AD and organ malperfusion, a hybrid approach (i.e. ascending aorta and/or arch replacement associated with any percutaneous aortic or branch artery procedure) should be considered.	IIa	В
In uncomplicated type-B AD, medical therapy should always be recommended.	I	C
In uncomplicated type-B AD, TEVAR should be considered.	(IIa)	В
In <u>complicated</u> type-B AD, TEVAR is recommended.	I	C
In <u>complicated</u> type-B AD, surgery may be considered.	IIa	C

Referral Network Aortic Service (for dissection analogy: rAAA)

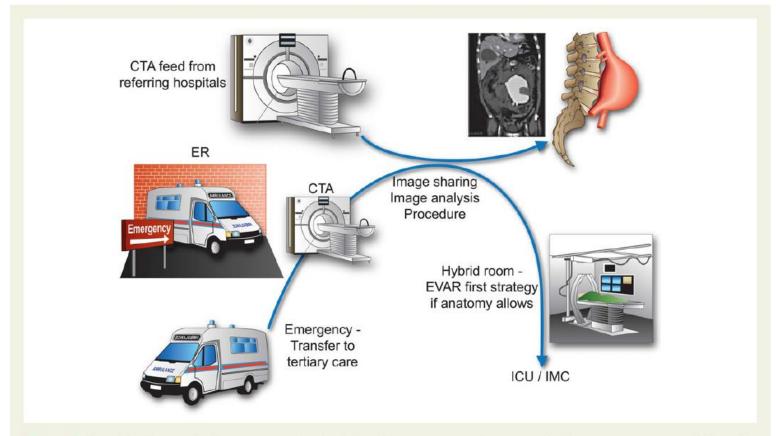


Figure I Streamlined care and swift management begins with rapid emergency transfer to a certified emergency care centre followed by diagnostic imaging. Diagnostic CT images may be shared with the surgical/interventional team in another hospital or directly fed into the hybrid theatre for optimal care e.g. an EVAR first strategy if anatomy allows.

Regionalized care offering all treatment options from ascending aorta to distal malperfusion

Improve trial, EHJ 2015





Retrograde Type A Dissection – Systematic Review

ORIGINAL ARTICLE

Retrograde Aortic Dissection After Thoracic Endovascular Aortic Repair

Ludovic Canaud, MD, PhD, Baris A. Ozdemir, BSc, MRCS, Benjamin O. Patterson, BSc, MRCS, Peter J. E. Holt, PhD, FRCS, Ian M. Loftus, MD, FRCS, and Matt M. Thompson, MD, FRCS

Objective: To provide data regarding the etiology and timing of retrograde type A aortic dissection (RTAD) after thoracic endovascular aortic repair (TEVAR)

Methods: Details of patients who had RTAD after TEVAR were obtained from the MOTHER Registry supplemented by data from a systematic review of the literature. Univariate analysis and binary logostic regression analysis of patient or technical factors was performed. Results: In MOTHER, RTAD developed in 16 of the 1010 patients (1.6%).

Binary logistic regression demonstrated that an indication of TEVAR for acrtic dissection (acute P = 0.000212; chronic P = 0.006) and device oversizing (OR $1.14~\mathrm{per}~1\%$ increase in oversizing above 9%, P < 0.0001) were significantly more frequent in patients with RTAD. Data from the systematic review was pooled with MOTHER data and demonstrated that RTAD occurred in 1.7% (168/9894). Most of RTAD occurred in the immediate postoperative (58%) period and was associated with a high mortality rate (33.6%). The odds ratio o RTAD for an acute aortic dissection was 10.0 (Cl. 4.7-21.9) and 3.4 (Cl. 1.3-8.8) for chronic aortic dissection. The incidence of RTAD was not significantly different for endografts with proximal bare stent (2.8%) or nonbare stent (1.9%)(P = 0.1298)

Conclusions: Although RTAD after TEVAR is an uncommon complication, it has a high mortality rate. RTAD is significantly more frequent in patients treated for acute and chronic type B dissection, and when the endograft is sigmificantly oversized. The proximal endograft configuration was not associated with any difference in the incidence of RTAD.

Keywords: complications, retrograde dissection, TEVAR, thoracic acrta (Ann Surg 2014;00:1-7)

horacic endovascular aortic repair (TEVAR) is extensively uti-lized as a treatment modality for pathology affecting the deseending thoracic aorta and distal aortic arch. One of the most feared complications of this procedure is retrograde type A aortic dissection (RTAD), which has a low incidence but high mortality.

Several reports have considered the etiological factors contributing to this potentially lethal complication, but data so far have been preliminary and interpretation made difficult by heterogenicity of data quality and reporting parameters. In the European Registry on Endovascular Aortic Repair Complications, Eggebrecht et al¹ reported 63 cases of RTAD among 4750 TEVAR procedures. In this series, it was suggested that the use of proximal bare spring endografts might be an important causative factor for RTAD. However,

From the Department of Outcomes Research, St George's Vascular Institute, Ludovic Canaud and Baris A. Ozdenir hold joint first authorship/contributorship

Annals of Surgery . Volume 00, Number 00, 2014

the ratio of proximal bare spring to proximal nonbare stent grafts was not reported.2 There is a general consensus that RTAD may be more common in patients with acute type B aortic dissection, but no definite association has been proven to date. Equally, there have been many mechanisms proposed to cause RTAD (extension of disease, wire trauma, and trauma from differing proximal endograft configurations) but little hard evidence to support evolving clinical practice or graft design.

The aim of this study was to provide insight into the etiological and procedural factors associated with RTAD following TEVAR. Data were obtained from the MOTHER1 registry and were supplemented by cases from a systematic review of the literature. Data from both sources were aggregated to report the contemporary literature

MOTHER Database

The MOTHER registry comprises the combined data from 5 prospective trials and institutional data from a single UK center, which has been previously described.³ Briefly, the registry consists of the endovascular arm of a phase II/III trial (VALOR I4), the intervention arm of a randomized controlled trial, INSTEAD,5 and 3 phase IV trials (VALOR II,5 Captivia, and VIRTUE). The single institute series included all TEVARs performed over a period of 8 years that used the Talent or Valiant stent graft systems. All of the trials had stringent protocols for data collection and validation. The institutional series was prospectively maintained, and follow-up was done by computed tomography. Morphological data available in the Mother registry were as follows: proximal aortic neck diameter, distal neck aortic diameter, aortic diameter at left subclavian artery, aortic diameter at left common carotid artery, and maximum aneurysm diameter. Device oversizing was calculated according to the diameter from the adventitia to adventitia of the proximal landing zone as compared with the diameter of the proximal endograft implanted.

Search Strategy

The systematic review conformed to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. A litera-ture search was undertaken to identify all published English language studies reporting RTAD after TEVAR. The EMBASE, MEDLINE, and COCHRANE databases were searched, for the period of 1993 to January 2013. Key words entered in this search were "TEVAR," "retrograde dissection," "thoracic stent-graft," "endograft," and "graft" with the Boolean operator OR. The reference lists of the articles obtained were reviewed for pertinent citations. In addition to those identified by the literature search data from the most important trial for the Gore Tag Thoracic Endograft^a and the Zenith TX2 Endovascular Graft[®] was included in analysis.

Studies were eligible for inclusion if they included patients who developed RTAD after TEVAR and reported clinical outcomes.

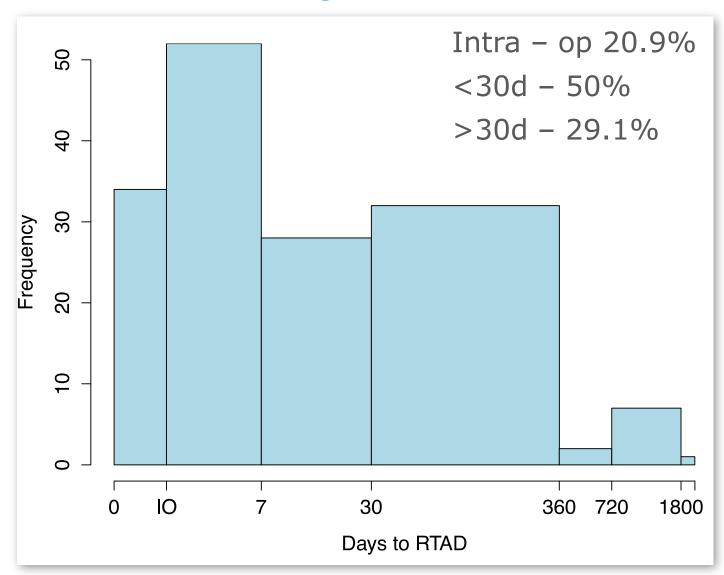
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- 38 reports: 9894 patients
- Overall incidence 1.7%
- Mortality 33.6%

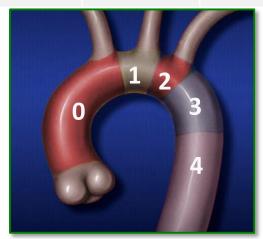
Timing of RTAD





RTAD is dependent on landing zone

Landing Zone	RTAD (%)	OR
0	6.8	5.7
1	2.4	1.9
2	4.1	3.3
3/4	1.3	1



RTAD is Pathology Specific

Incidence of RTAD for specific pathologies:

TAA: 0.9% [TAT 0%]

Acute dissection: 8.4%

Chronic dissection: 3%

OR (relative TAA): 10 AAD/3.4 CAD





Summary

- Care of acute type B dissection continues to develop
 - Growing evidence base for intervention
 - Increasing awareness of 'complications'
 - Need to manage patients in centre of excellence
- Early days and weeks require focus on
 - Stabilisation and life/organ/limb saving intervention
 - Accurate diagnosis including complications
 - Assessment of risk
 - Timeliness of intervention

