



The Challenge of the Proximal Neck: How to Secure Seal and Fixation

Tilo Kölbel, MD, PhD

Dep. of Vascular Medicine
University Heart Center Hamburg

CONTROVERSES
ET ACTUALITÉS EN CHIRURGIE VASCULAIRE
**CONTROVERSIES
& UPDATES
IN VASCULAR SURGERY**
JANUARY 17-19 2013
MARRIOTT RIVE GAUCHE & CONFERENCE CENTER
PARIS, FRANCE

Disclosures



- * Research-grants, travelling, proctoring speaking-fees, IP with Cook.
- * Research-grant, travelling, speaking-fees with Cordis
- * Research-grant, proctoring with Atrium

What contributes to seal and fixation in prox. Neck ?



- * Properties of the landing zone:

- * Length
- * Diameter
- * Curvature

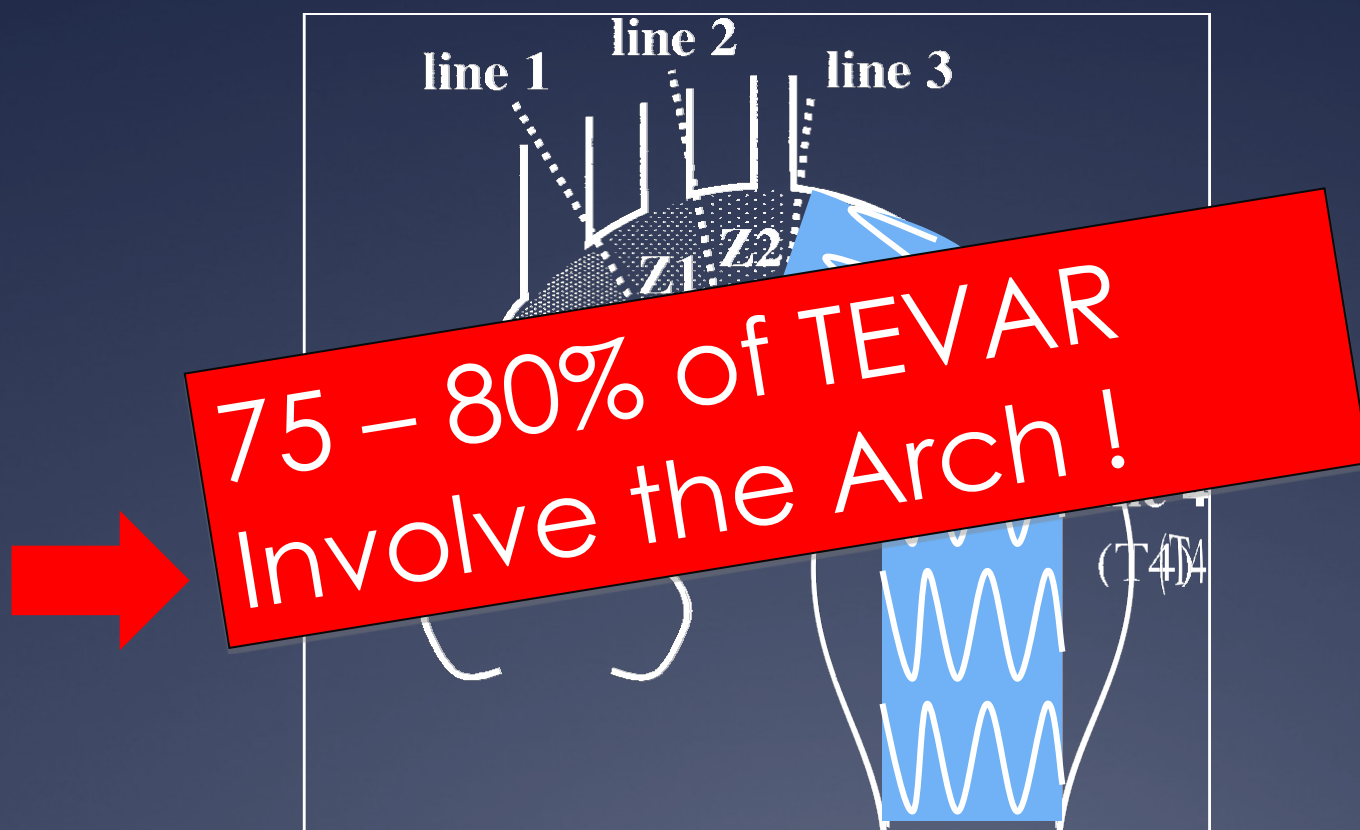
- * Properties of the stent-graft

- * Radial force
- * Graft diameter and fabric
- * Conformability and conformance
- * Active fixation

- * Procedural factors

- * Accuracy of deployment
- * Ballooning
- * Other adjunctive techniques

Aortic Arch Zones



Ishimaru-classification

Challenges of the Aortic Arch



- * Branch vessels

Patency / endoleak

- * Pulsatility

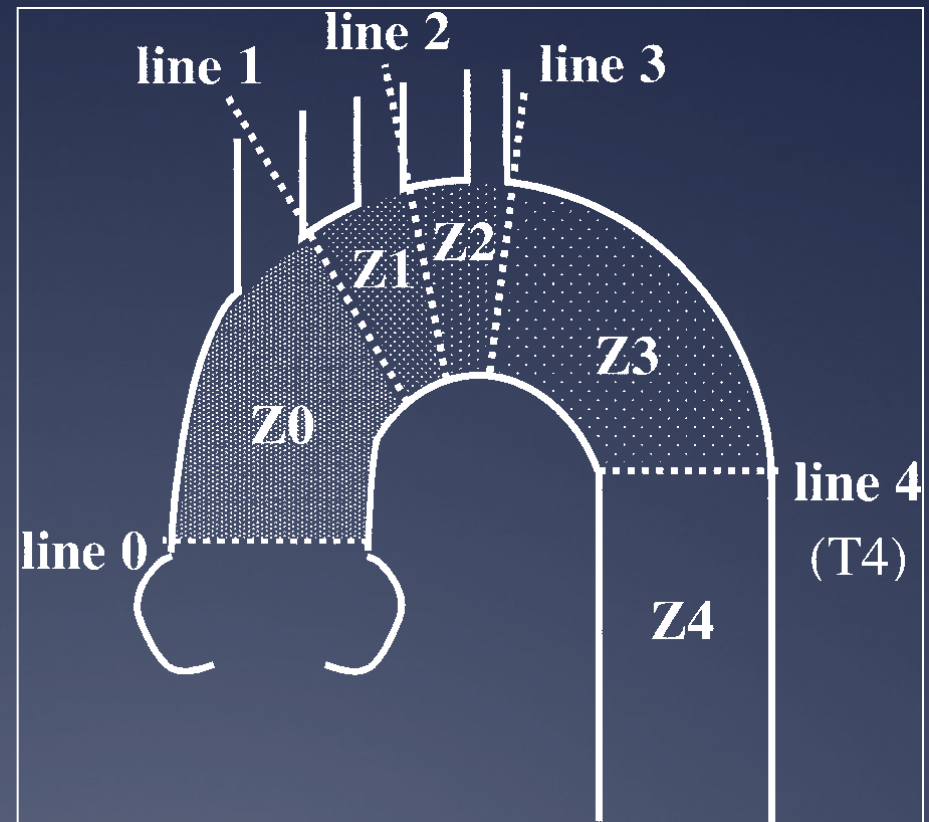
Oversizing / migration

- * Curvature

Conformity / infolding

- * Access

Distance / profile / kinking



Techniques to improve apposition and seal



- * Choice of better landing zone

- * Debranching techniques
- * Fenestrated and branched stent-grafts
- * Chimney and fenestration-techniques

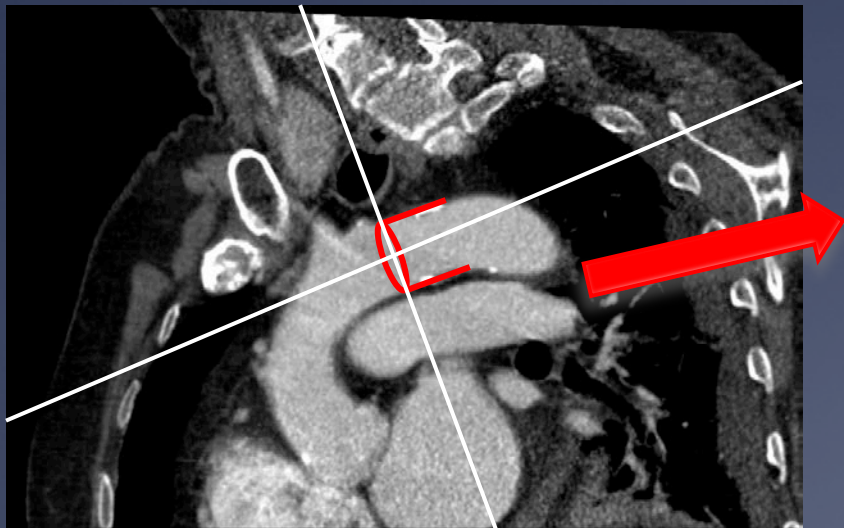
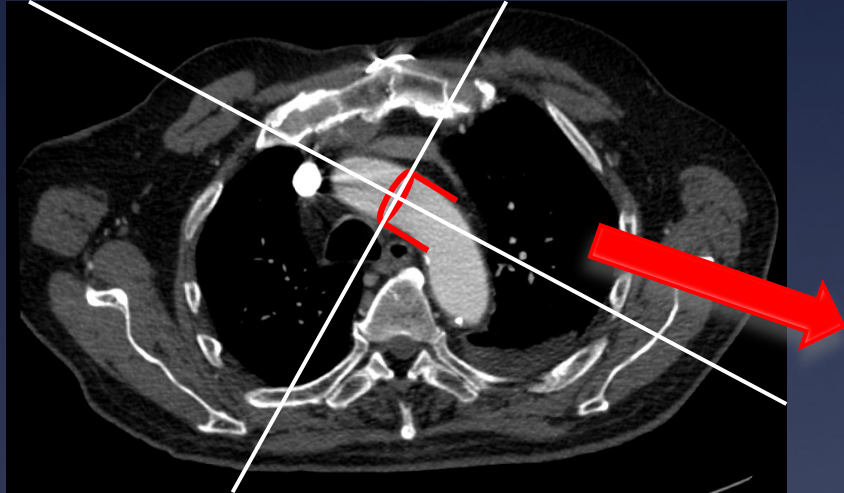
- * Choice of stent-graft

- * Correct oversizing
- * Deployment sequence
- * Conformability and conformance

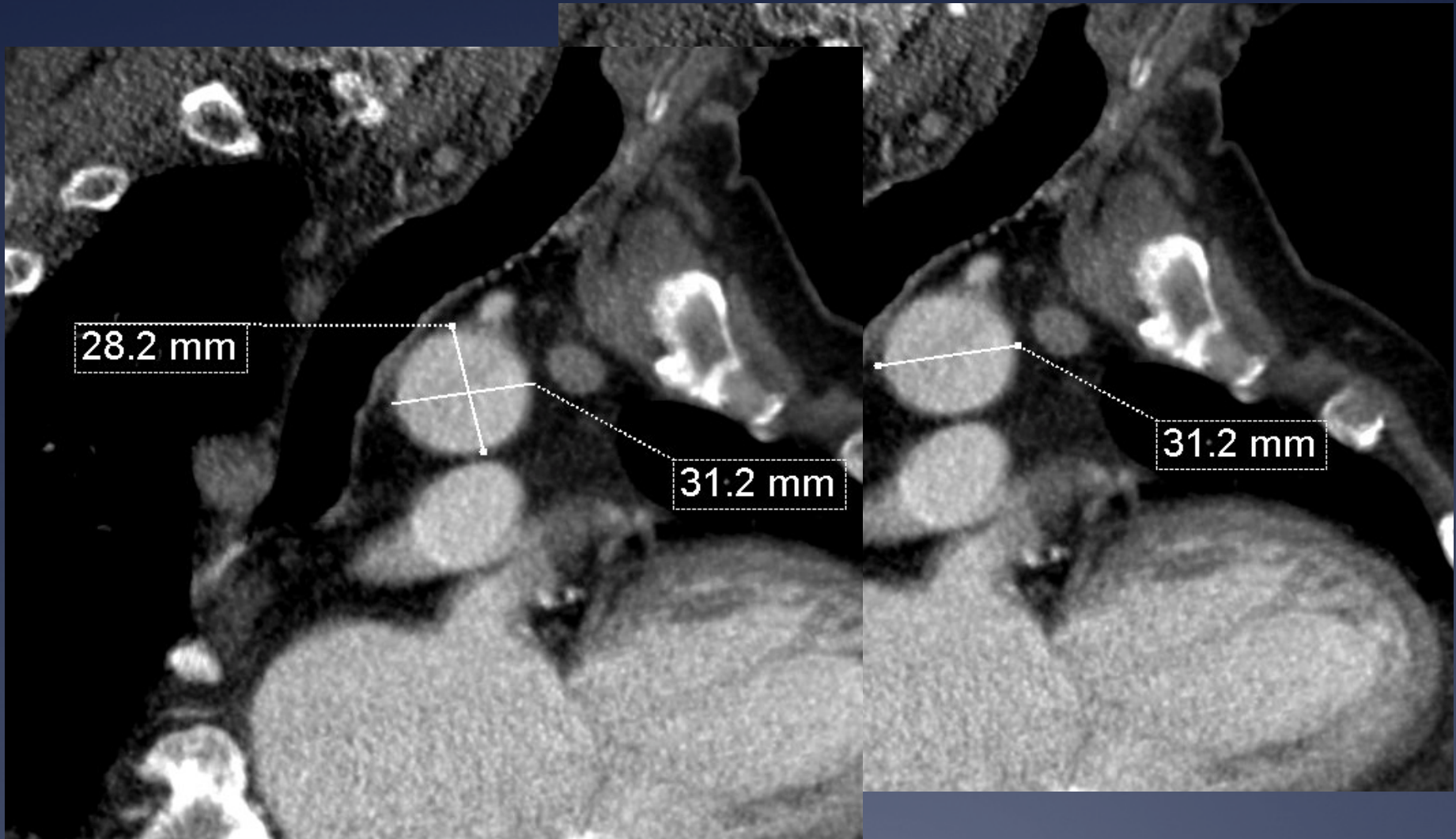
- * Deployment techniques

- * Cardiac output reduction
- * Throughwire techniques

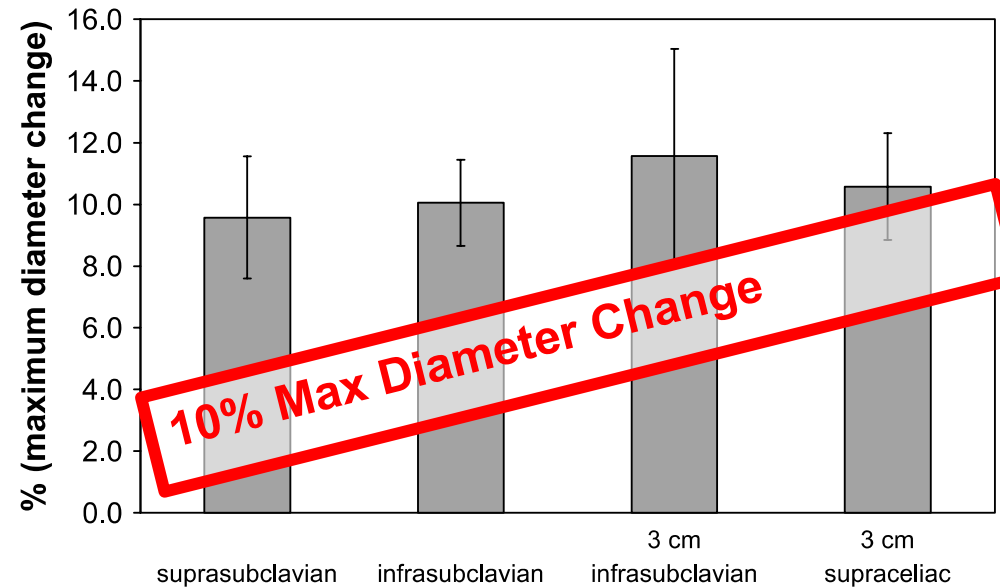
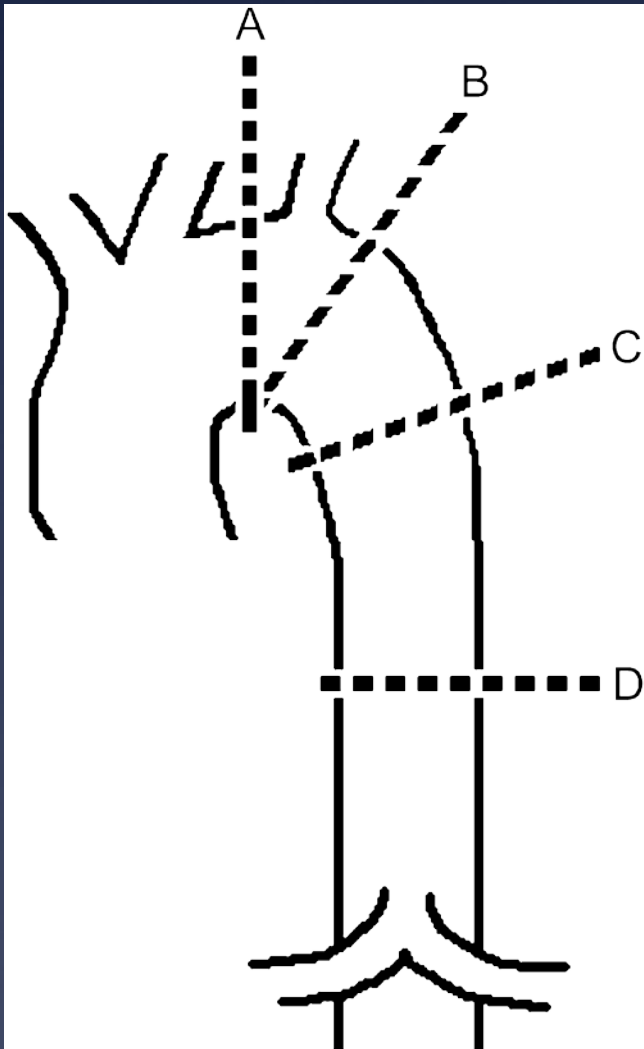
Perpendicular Diameter in MPR



Perpendicular Diameter



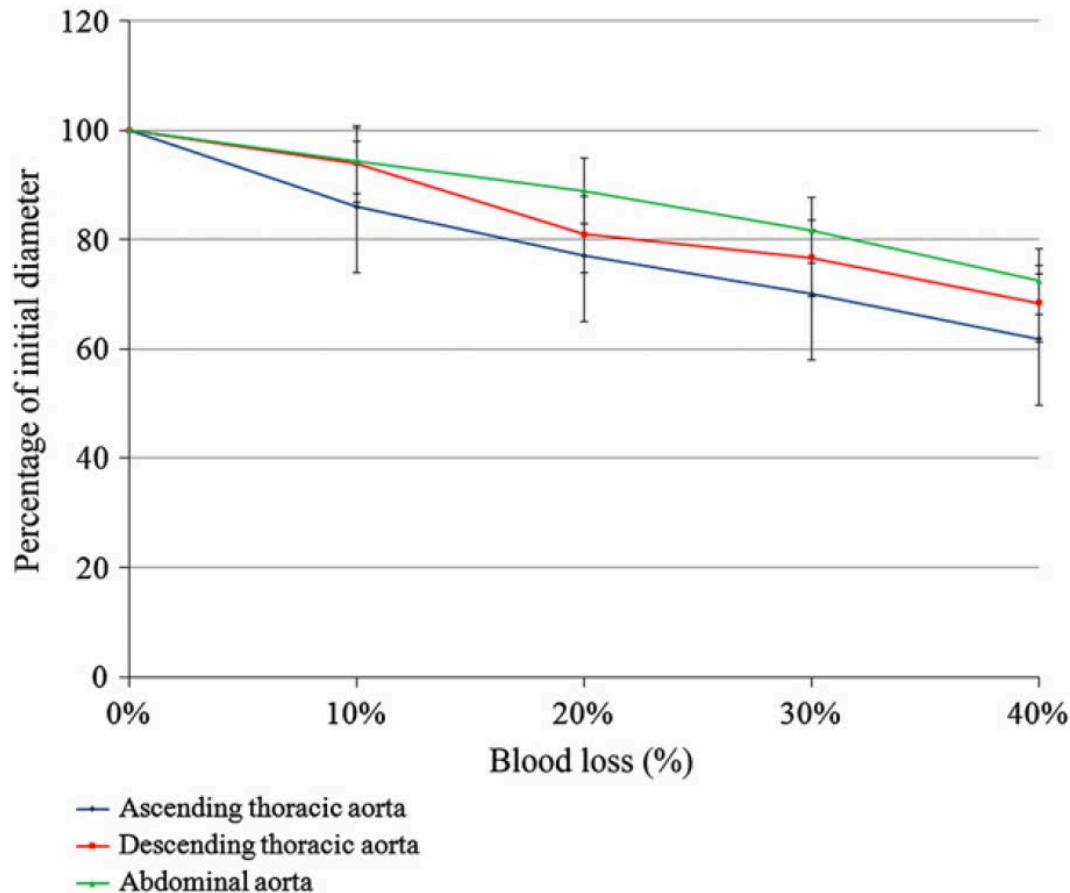
Pulsatility



Dynamic Cine-CT Angiography for the Evaluation of the Thoracic Aorta; Insight in Dynamic Changes with Implications for Thoracic Endograft Treatment

B.E. Muhs,¹ K.L. Vincken,² J. van Prehn,¹ M.K.C. Stone, L.W. Bartels,² M. Prokop,²
F.L. Moll¹ and H.J.M. Verhagen^{1*}

Hypovolemia and aortic diameter

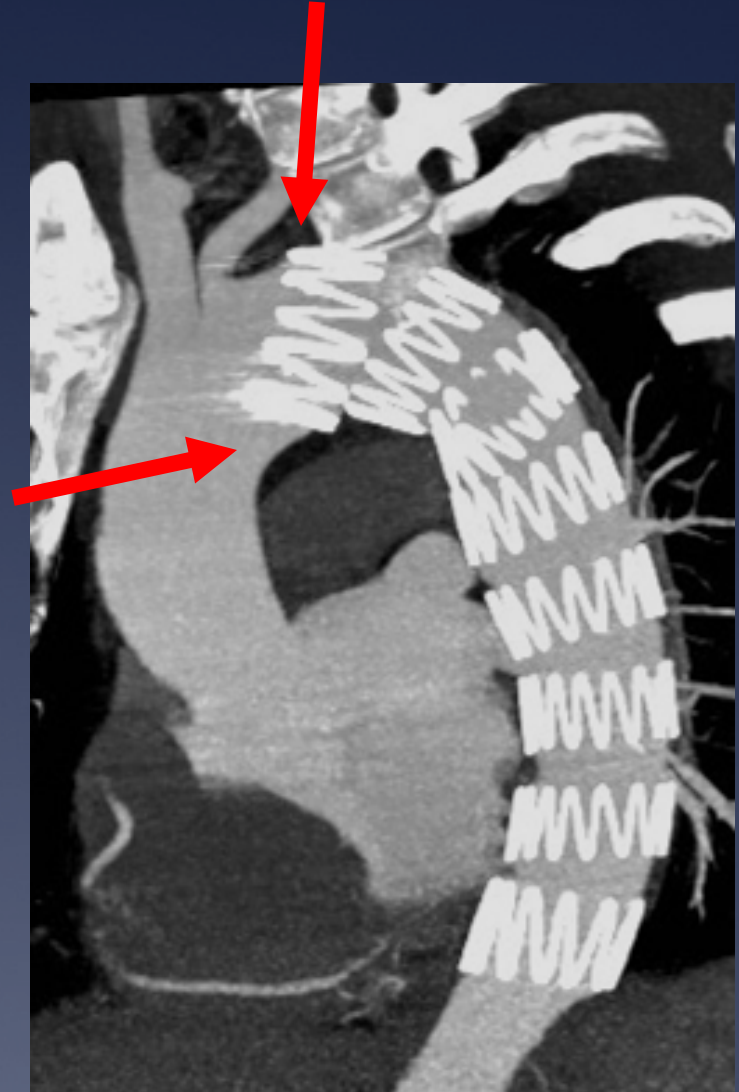


SG-Limitations in the aortic arch



Insufficient SG-conformity
to the anatomy of the arch

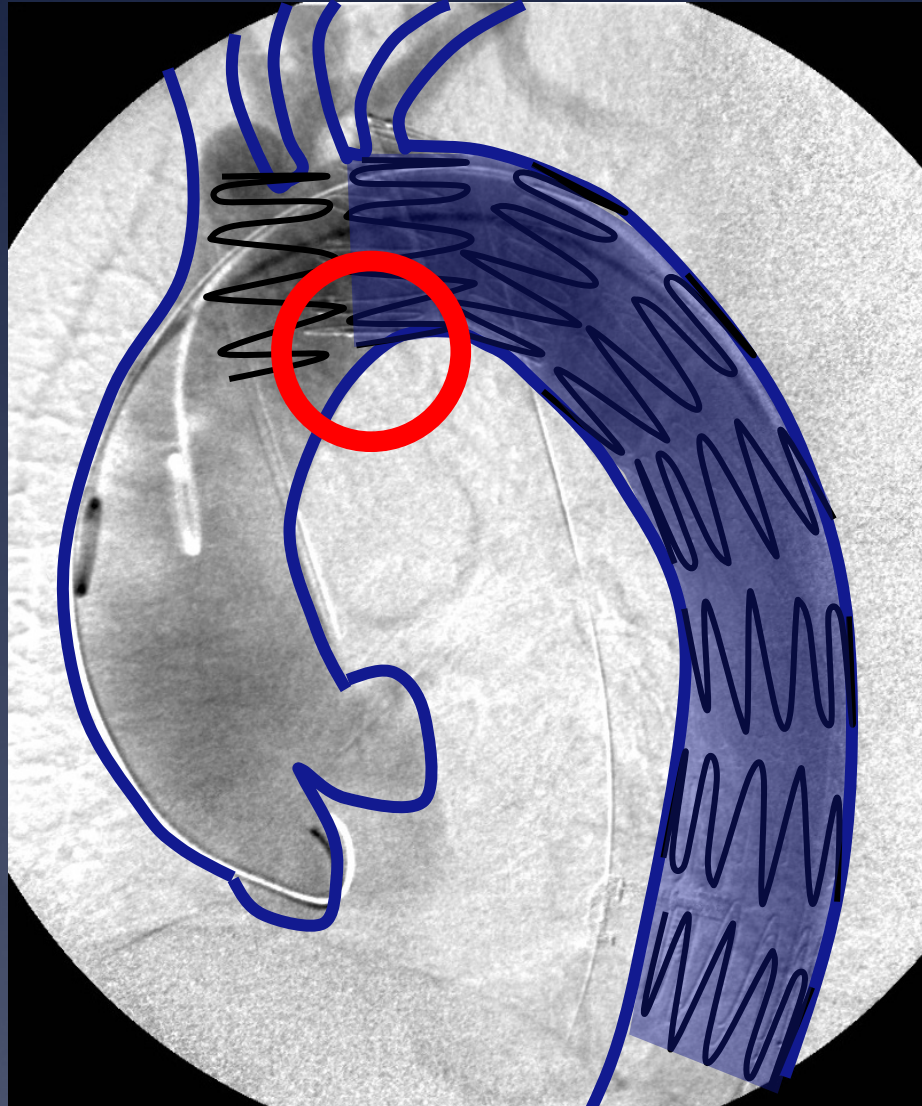
- Aortic wall erosion
- Type 1 endoleak
- Stent-graft collapse



Techniques for better Conformance

- * Proximal barestents
 - * Medtronic Captivia
 - * Bolton Relay
 - * Gore c-TAG
 - * Jotec
- * Improved conformability
 - * Gore cTAG
- * Staged proximal deployment
 - * Cook ProForm
 - * Bolton Relay NBS

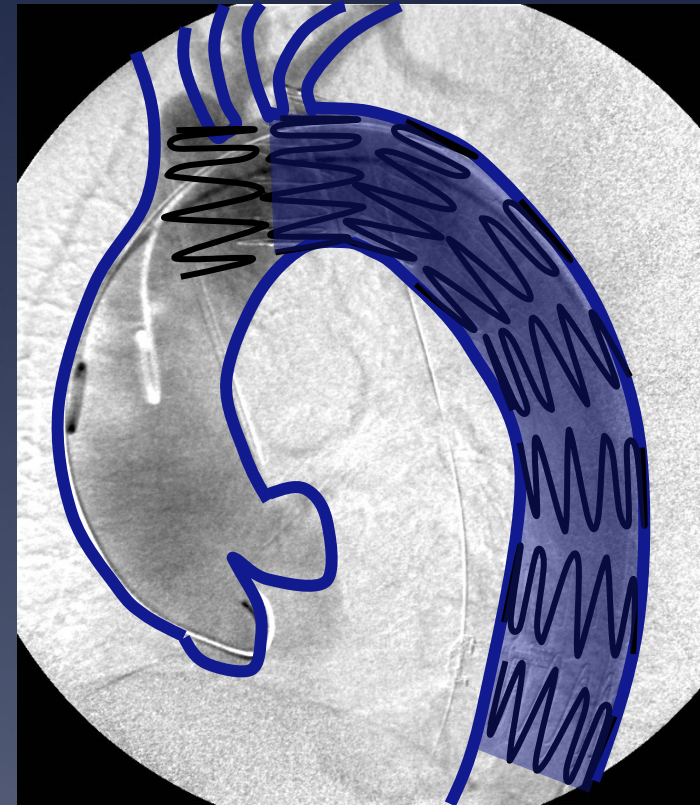
Barestents



Problems with Barestents



- Excessive radial force of uncovered stent-tops
- Crossing into aortic arch-branches
- Pressure erosion due to arch-movements
- Traumatic deployment





274

J ENDOVASC SURG
1998;5:274-277

◆ CASE REPORT ◆

Late Aortic Arch Perforation by Graft-Anchoring Stent: Complication of Endovascular Thoracic Aneurysm Exclusion

Martin Malina, MD, PhD; Jan Brunkwall, MD, PhD;
Krasnodar Ivancev, MD, PhD*; Bengt Lindblad, MD, PhD;
Janne Malina, MD†; Ulf Nyman, MD, PhD*; and
Bo Risberg, MD, PhD

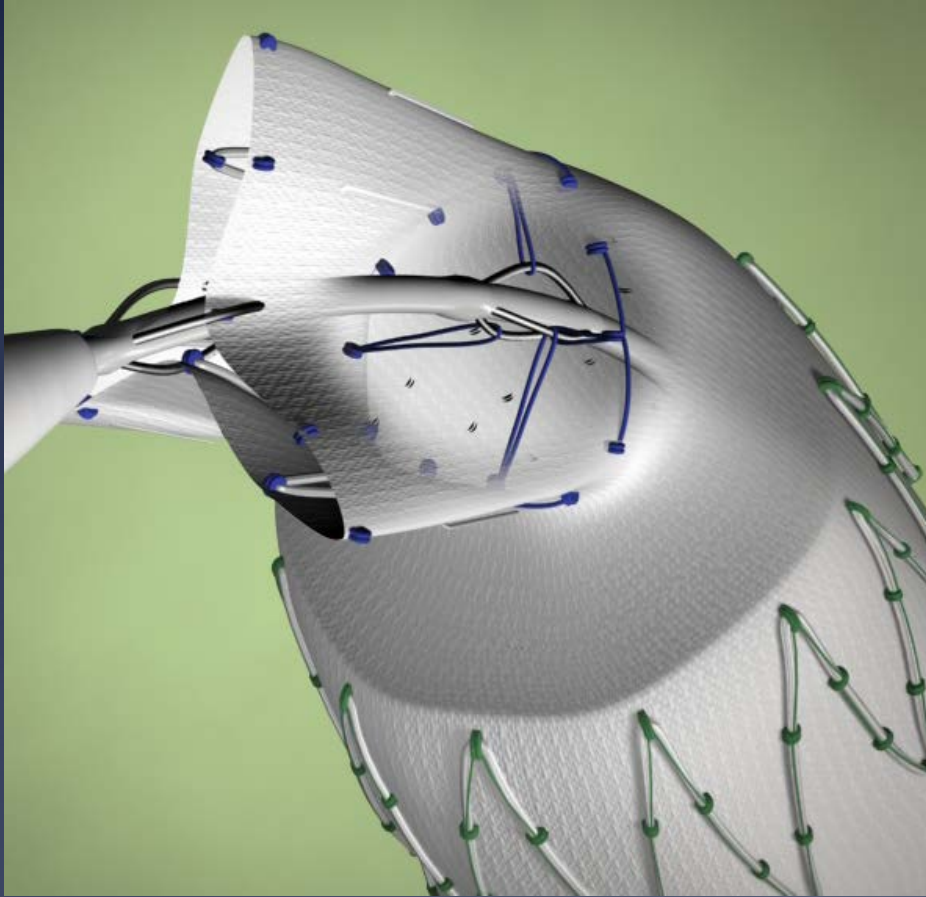
* *“In order to avoid aortic arch damage by stents, the fabric of thoracic stent-grafts should probably fully cover the proximal stent.”*



Retrograde Type A Dissection



Staged Deployment sequence

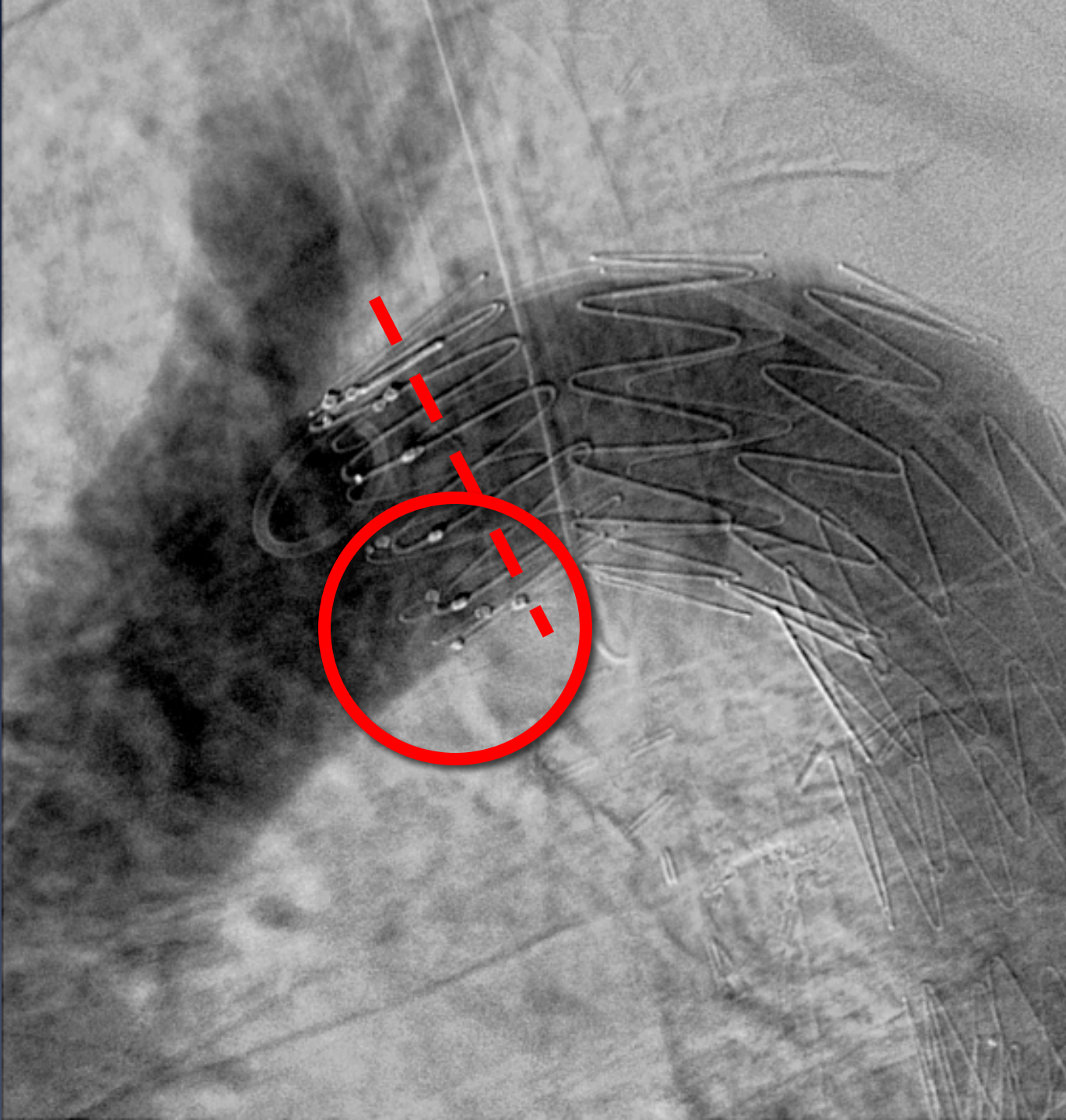


Cook TX2 ProForm



Bolton Relay NBS

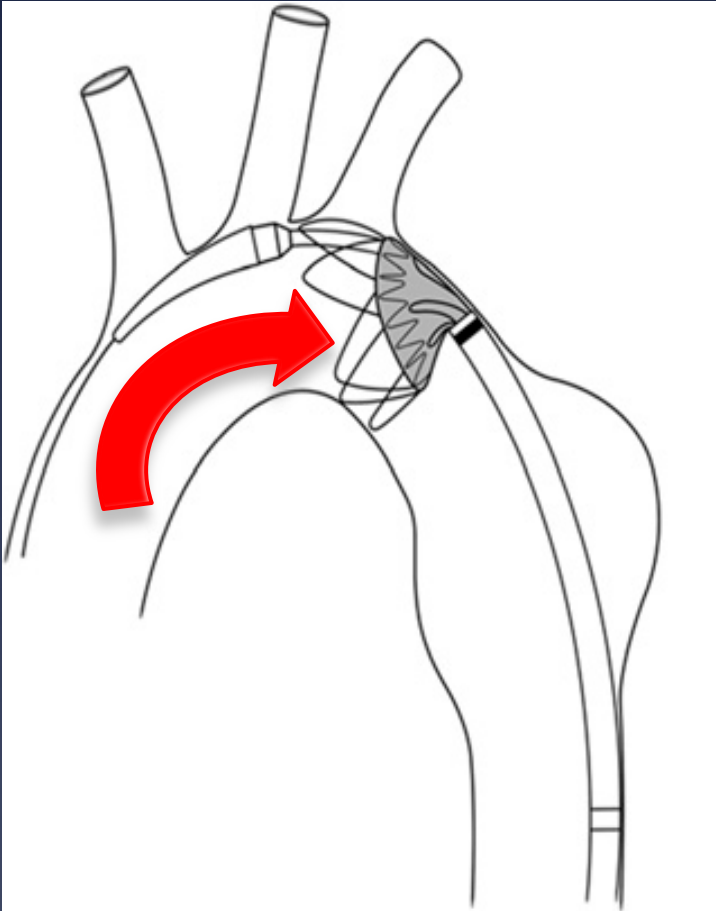




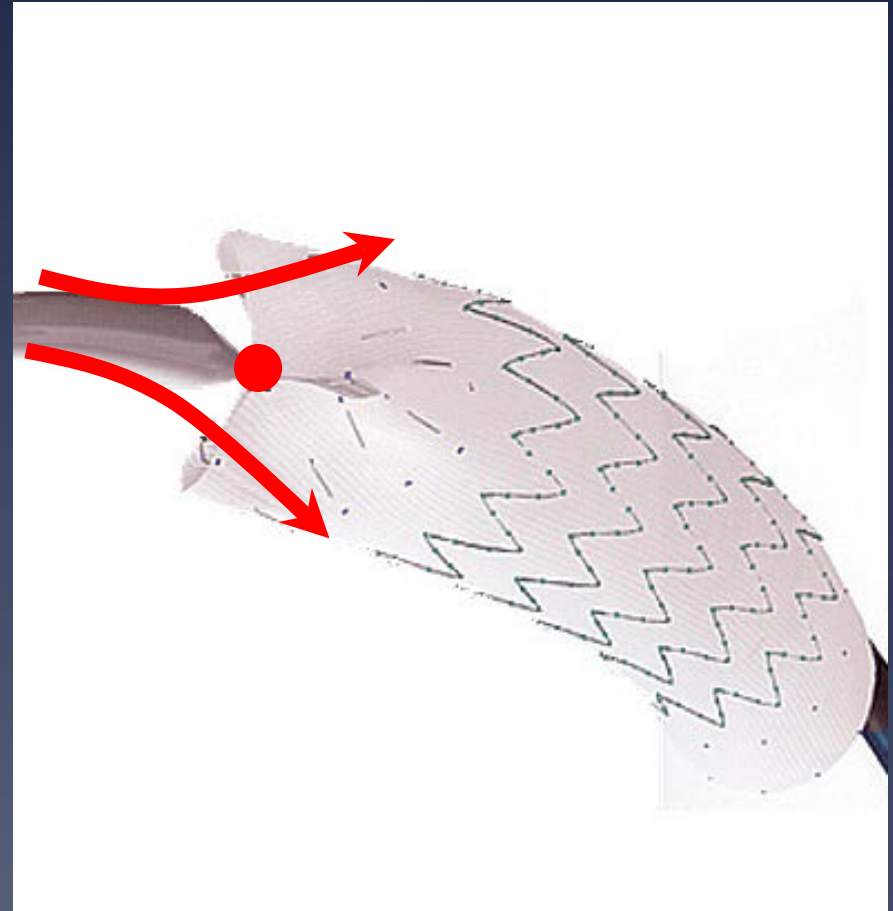
Conformability



Windsocket Effect – Retroflexion



Kasirajan et al; J Vasc Surg 2010



Cook TX2

Conclusion



- * Proximal seal and fixation is a major factor for success of TEVAR.
- * Anatomical, device-related and procedural factors influence seal and fixation.
- * Choice of sealing zone, endograft-properties, and procedural techniques influence outcome of TEVAR.