



University Heart Center
Hamburg

GERMAN
AORTIC CENTER
HAMBURG



How I Do It:

Rapid Pacing and IVC Occlusion in TEVAR

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20TH INTERNATIONAL EXPERTS SYMPOSIUM

CRITICAL ISSUES

in aortic endografting 2016

May 20 & 21 - LILLE - FRANCE





Why to do it?

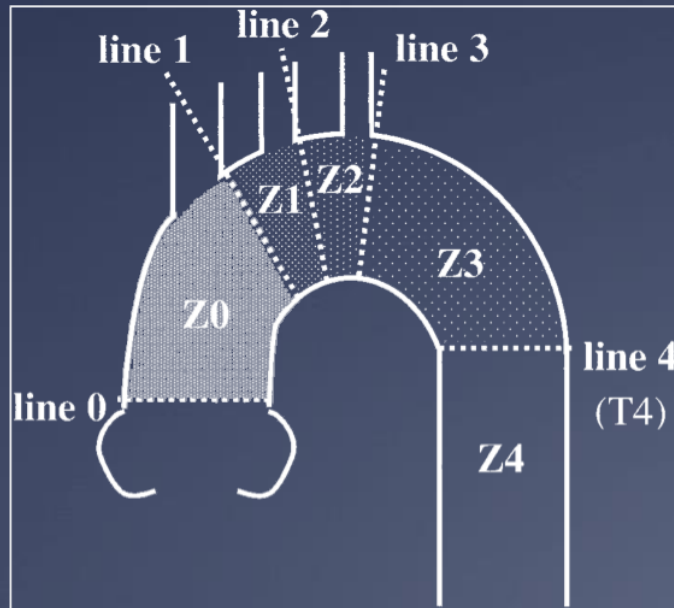


- * Enable precise positioning and deployment
- * Protect the left ventricle

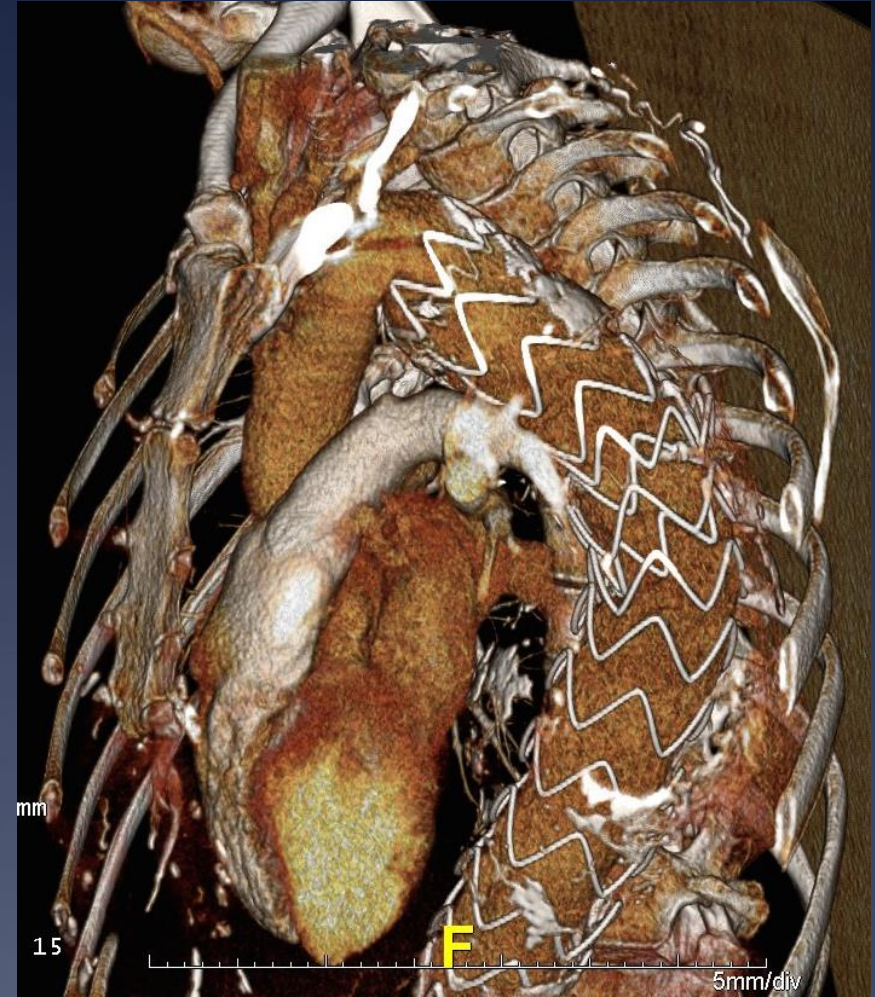
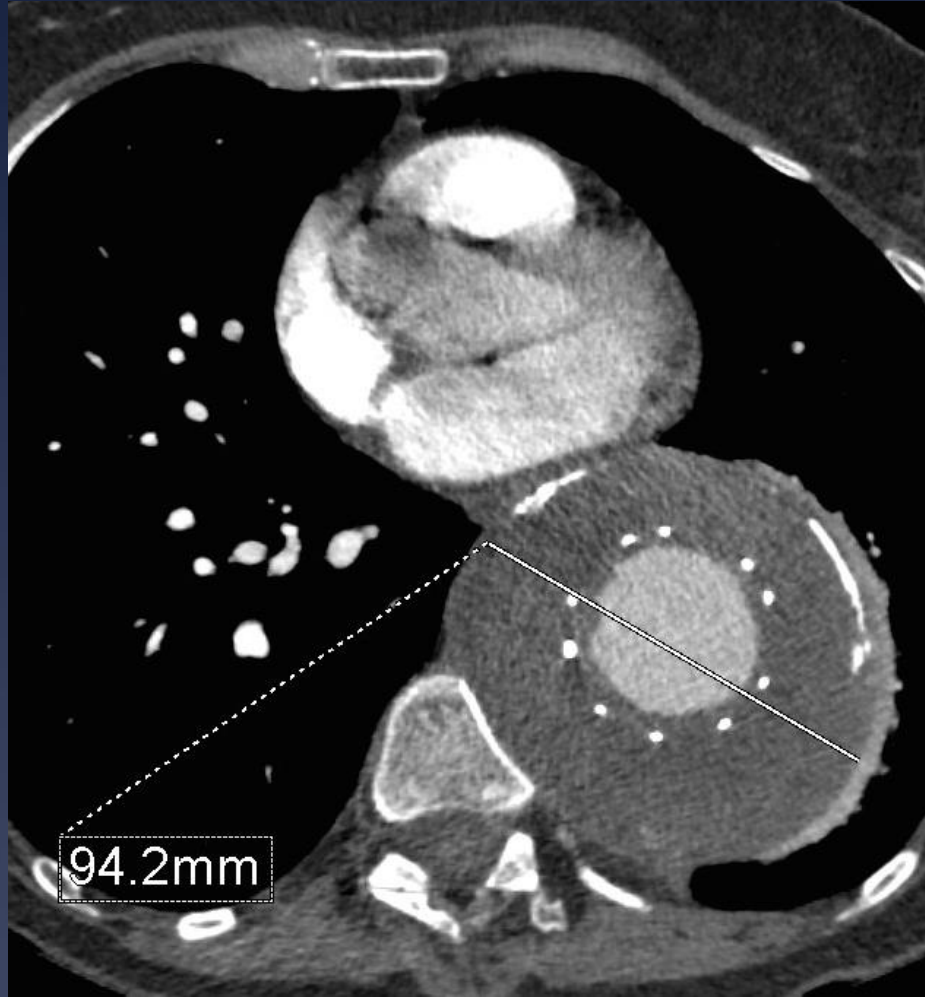
When to do it?



- * Proximal deployments: Zone 0
- * Sensitive deployment, e.g. short landing zone
- * Grafts without proximal fixation
- * Grafts exposing large graft surface: Umbrella-type

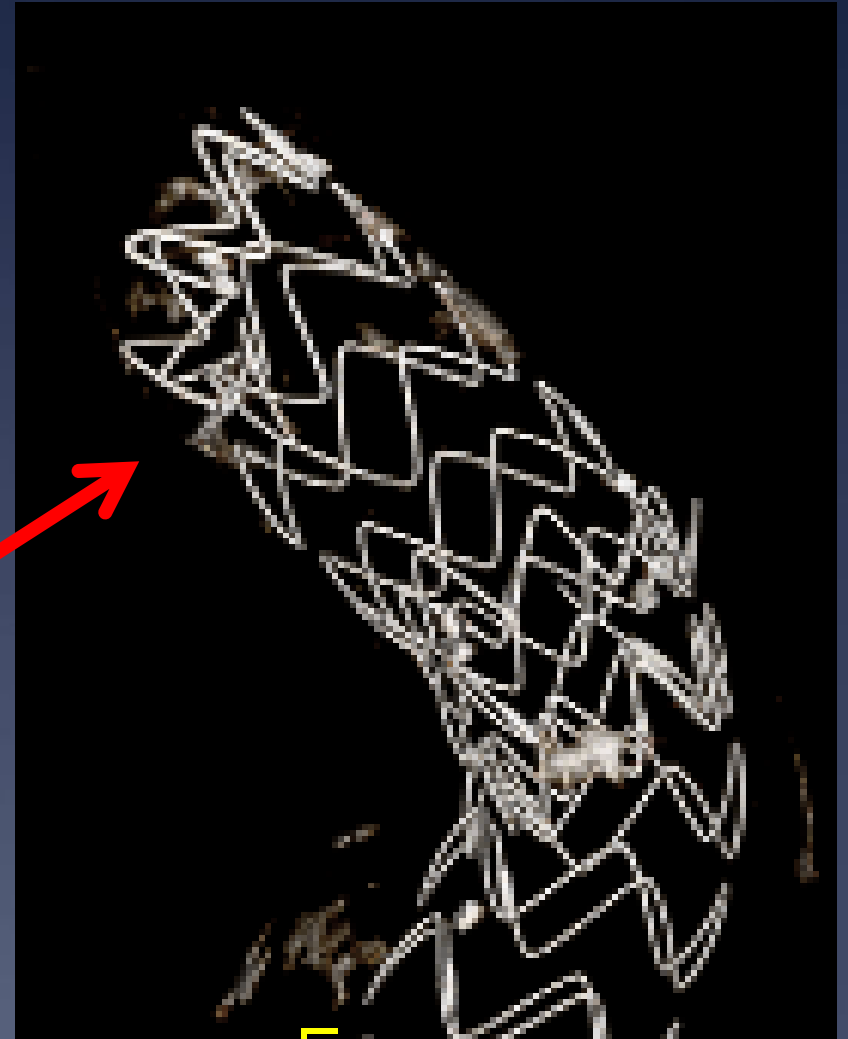
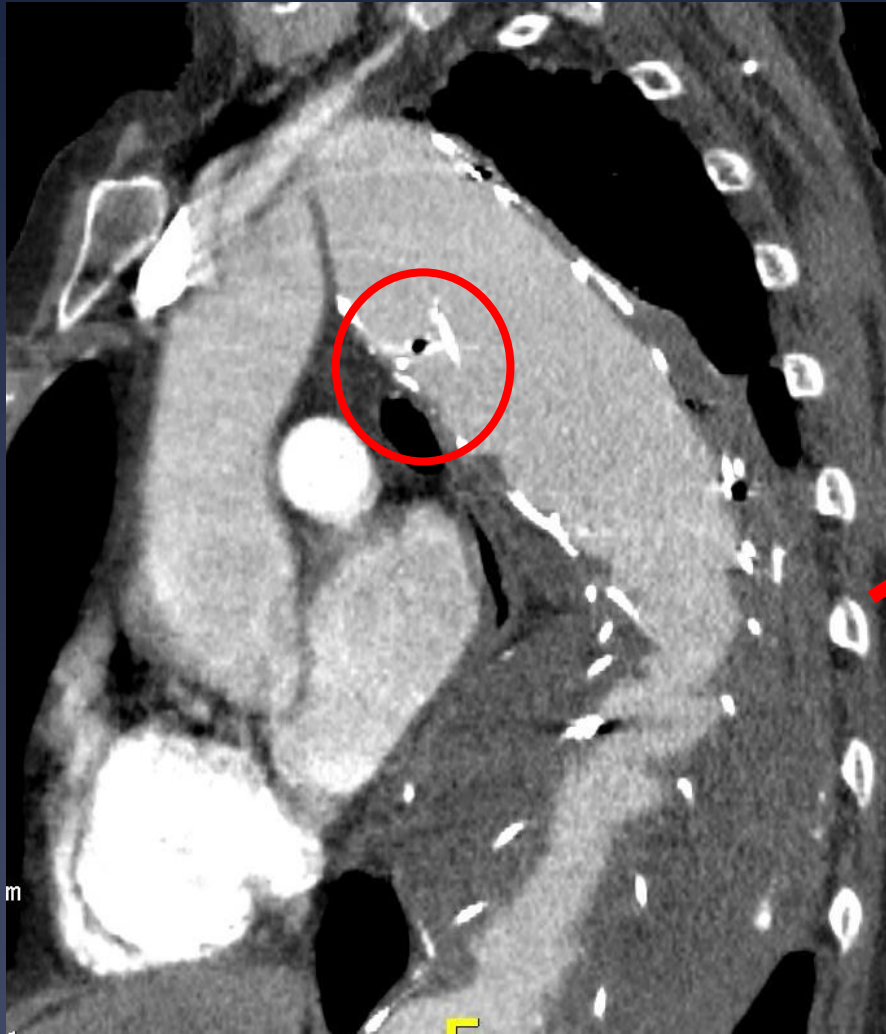


„Type V Endoleak“



Case from Outside Hospital: TAA-enlargement 6.5 → 9.5cm after TEVAR over 5y

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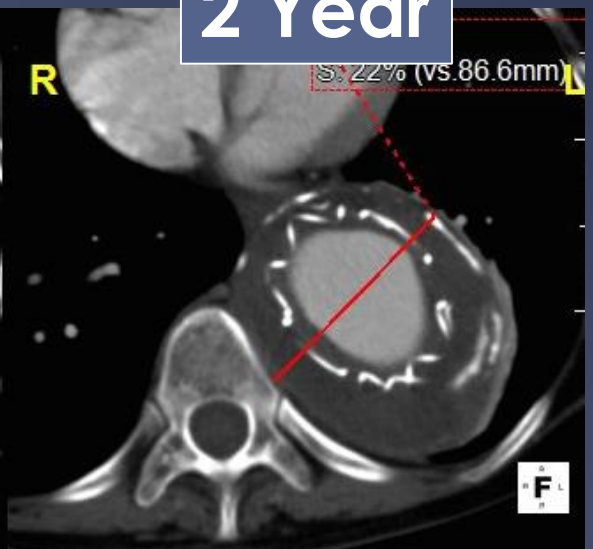
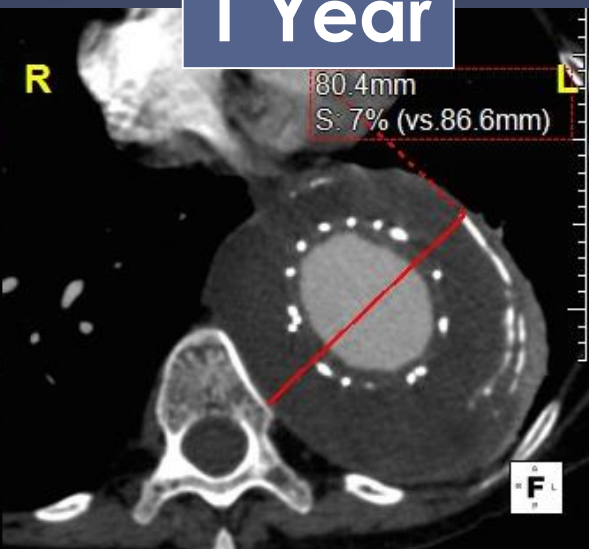
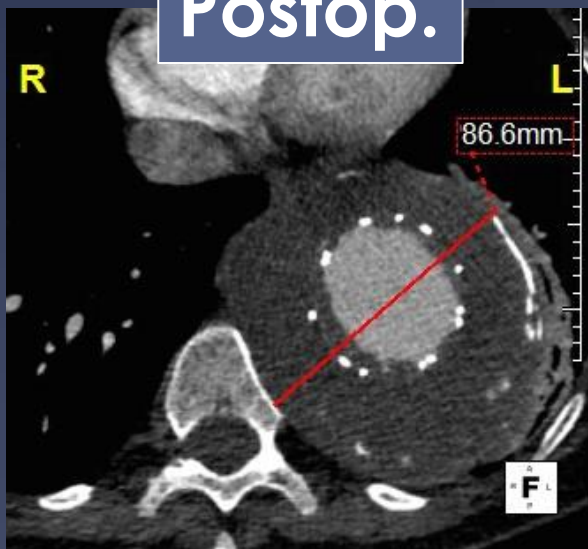
Postop.



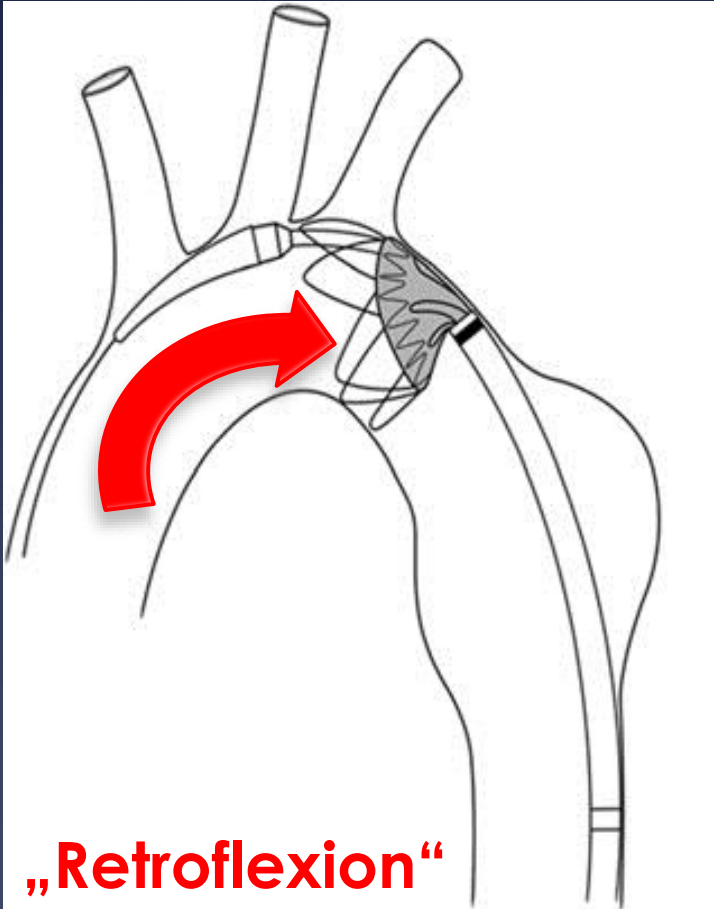
1 Year



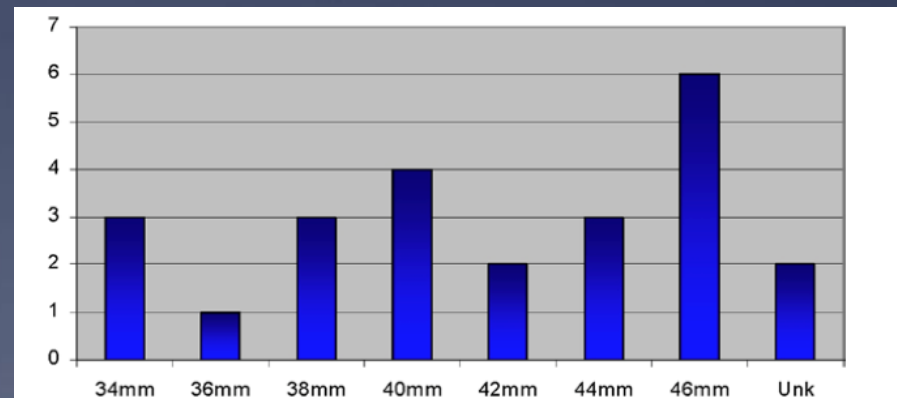
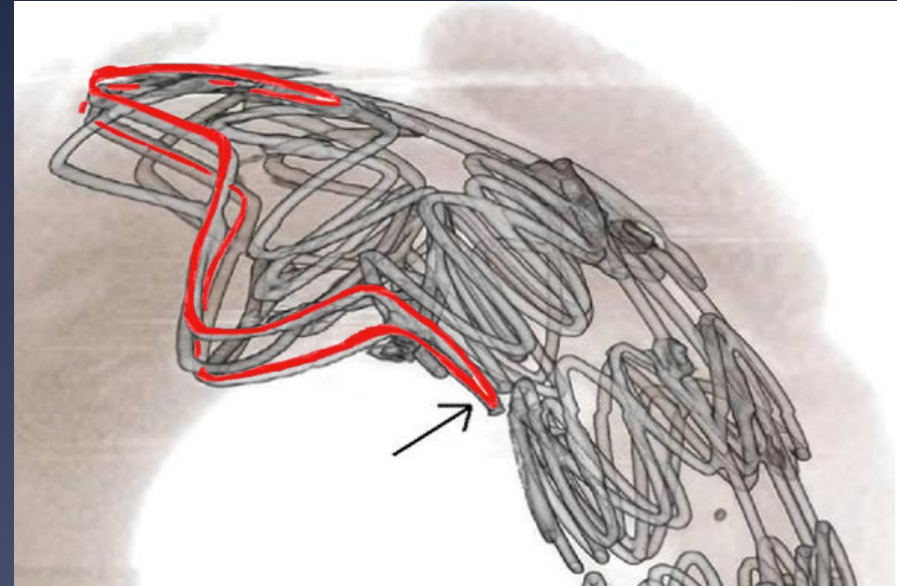
2 Year



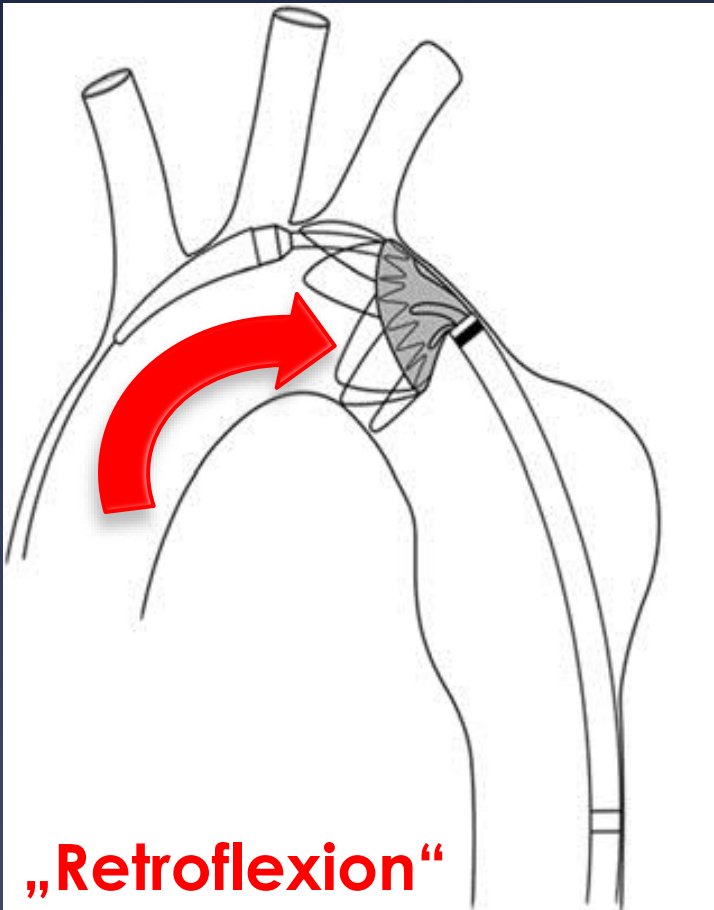
Windsocket Effect



Kasirajan et al; J Vasc Surg 2010



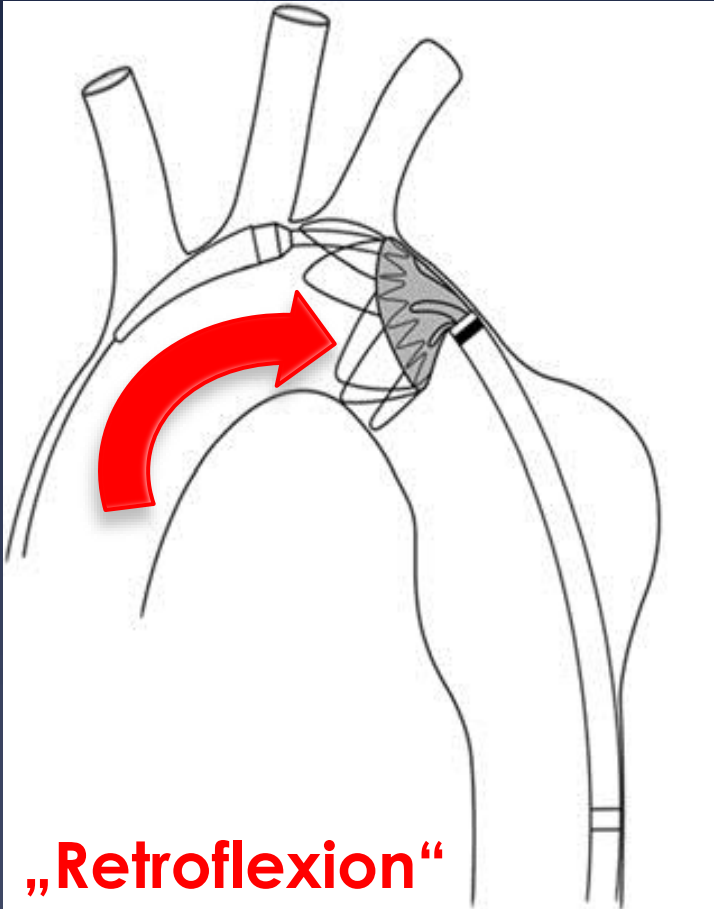
Windsocket Effect



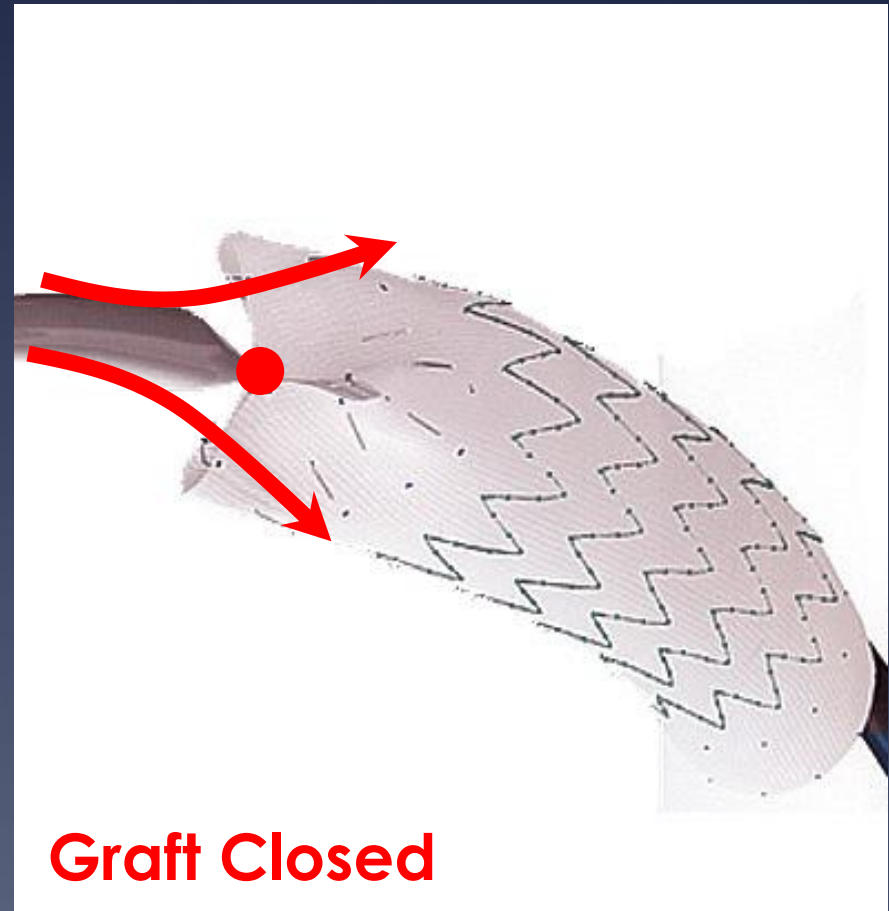
➔ Cardiac Output reduction:

- * Adenosine
- * Rapid Pacing
- * IVC balloon occlusion

Windsocket Effect

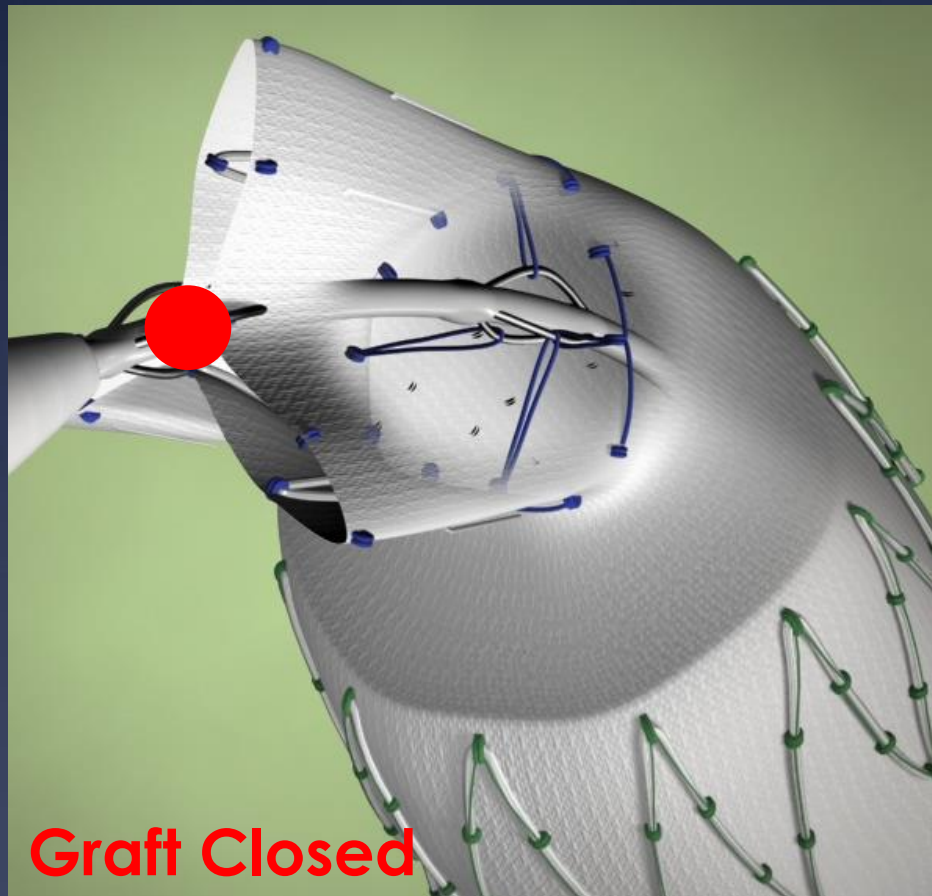


Kasirajan et al; J Vasc Surg 2010



Cook TX2

Proximal Fixation

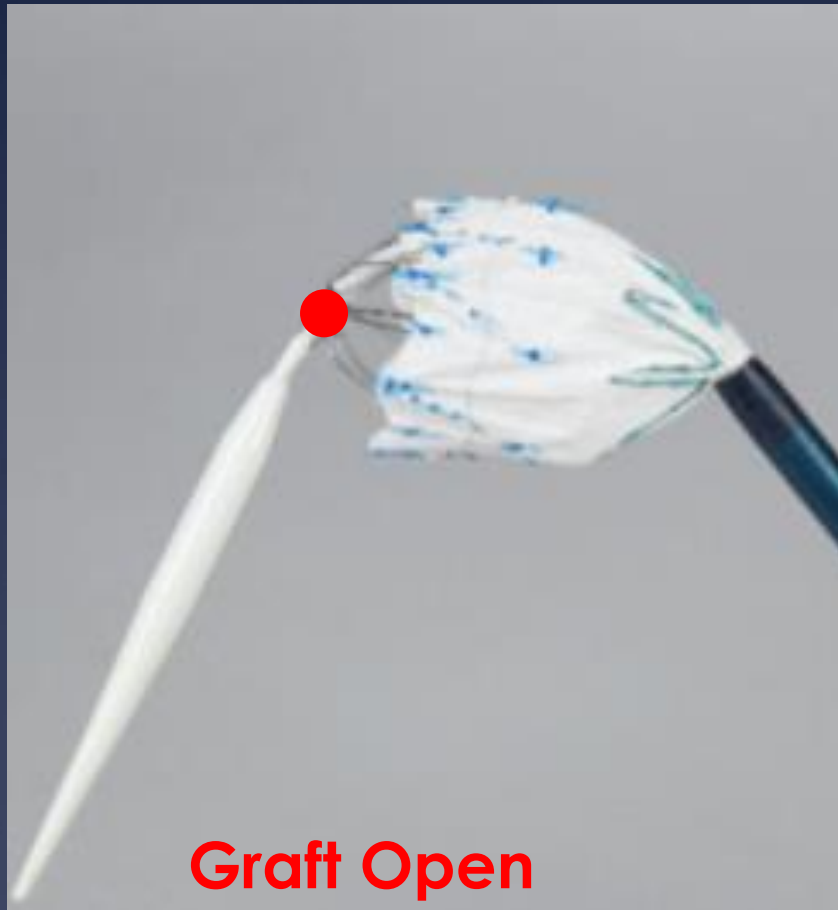


Cook TX2 ProForm



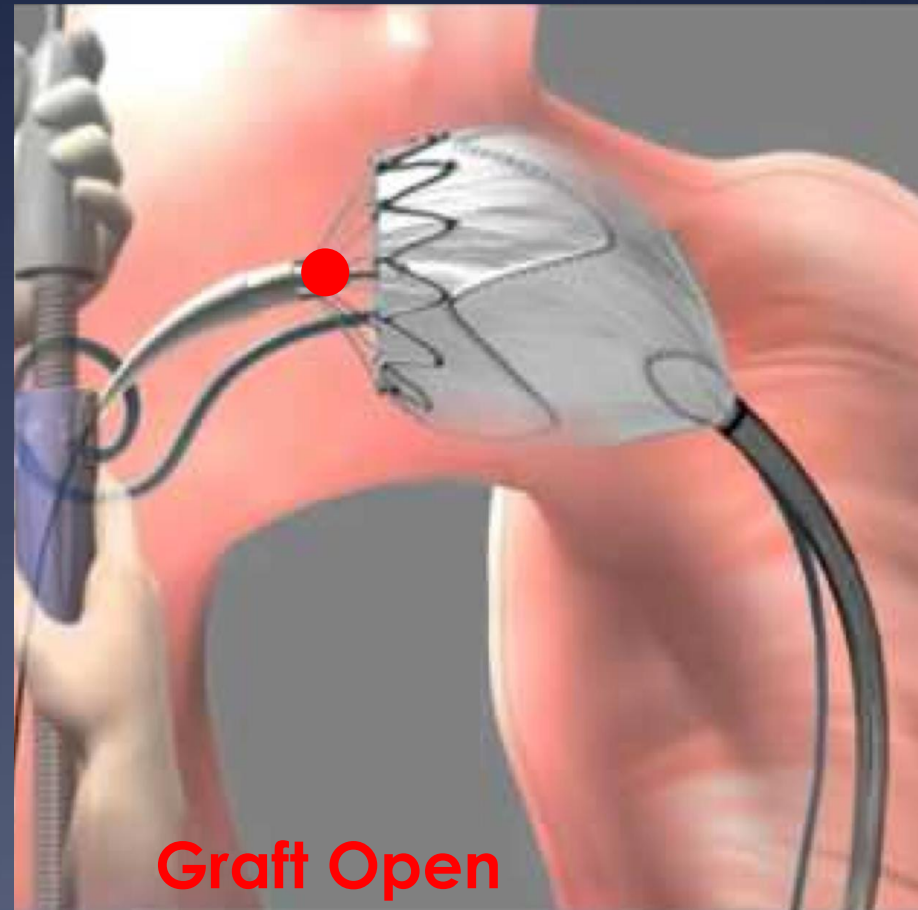
Relay NBS

Proximal Fixation



Graft Open

Cook Zenith Thoracic Alpha



Graft Open

Medtronic Valiant Captivia



How Do We Prevent Windsocketing ?



- * Reduce cardiac output !
- * Cardiac output reduction can be measured by the BP.

But:

- * Reduction of BP is not the aim but the way to measure cardiac output reduction!

Which Technique?



→ Cardiac Output reduction:

* Adenosine

Masui. 2013 Apr;62(4):402-5.

[Three cases of ATP-induced bronchospasm during thoracic endovascular aortic repair].

[Article in Japanese]

Takada Y¹, Kawagishi T, Kii N, Higuchi M, Yamauchi M, Yamakage M.

 **Author information**

Abstract

We report three cases (73-year-old, 69-year-old and 76-year-old men) of bronchospasm induced by adenosine triphosphate (ATP) during thoracic endovascular aortic repair (TEVAR). Severe bronchospasm occurred soon after administration of ATP to obtain transient asystole during TEVAR. All three cases were complicated with asthma or chronic obstructive pulmonary disease (COPD) before TEVAR, and airway hyper-reactivity was suspected. One case (73-year-old) required postoperative intensive care to treat bronchospasm, and the other two cases recovered during the operation. The possible mechanism of adenosine-induced bronchoconstriction is selective interaction with active mast cells with subsequent release of preformed and newly formed mediators. Careful attention should be paid when ATP is injected during TEVAR in patients with asthma or COPD.

PMID: 23697189 [PubMed - indexed for MEDLINE]

Which Technique?



Rapid Ventricular Pacing

- * Easy to do (also for the surgeon?)
- * Quick-start
- * Limited
- * C
- * C

IVC- Balloon Occlusion

- * Easy to do
- * Relative output reduction
- * Cheap

Use, what is easier to establish in your center.

How I Do It:



IVC-Balloon occlusion:

- * 14F 30cm Check-Flo sheath
- * Right femoral vein access
- * 46mm Coda balloon
- * 30-40ml filling volume
- * Stop inotropic drugs 2min before use
- * Talk to the anaesthetist and explain what you are doing.
- * Test once before use under deployment, adjust volume.

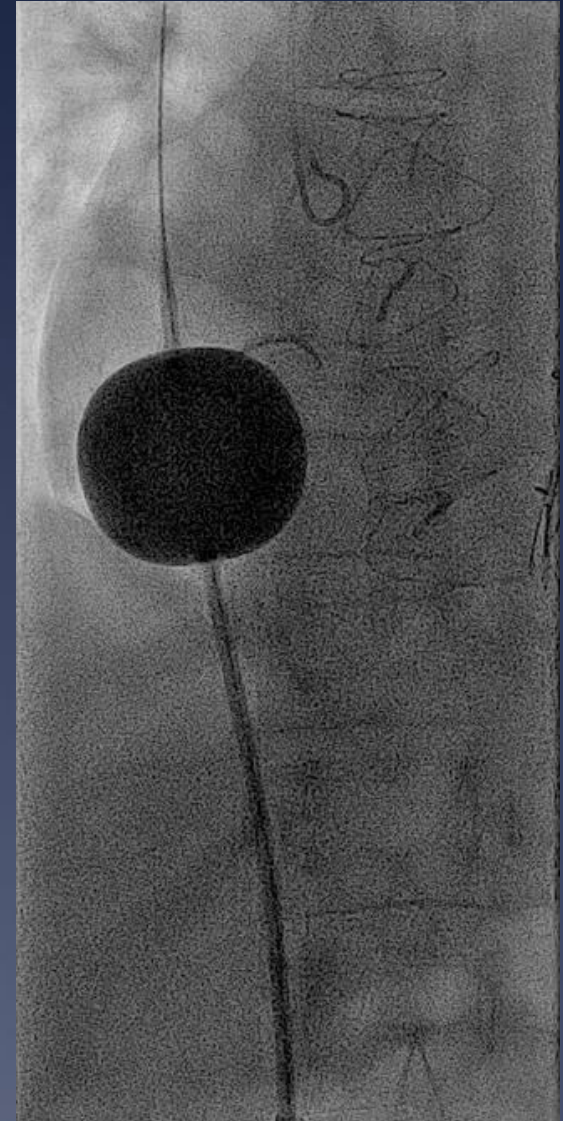


How I Do It:



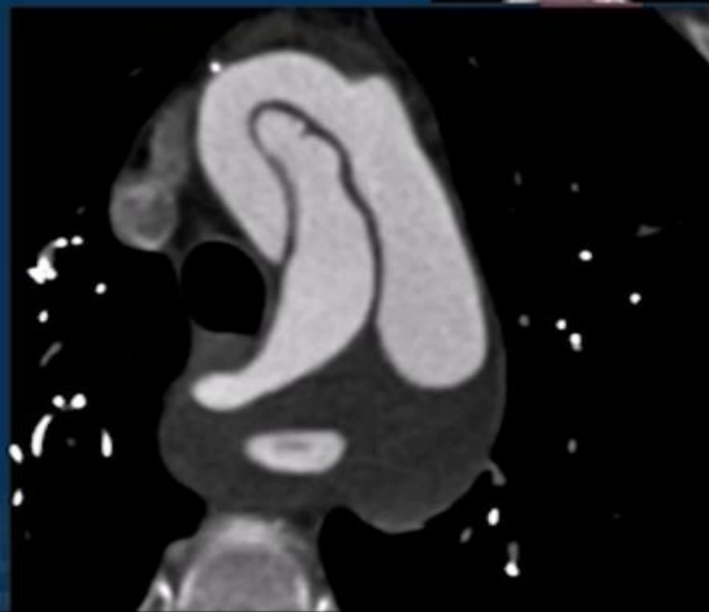
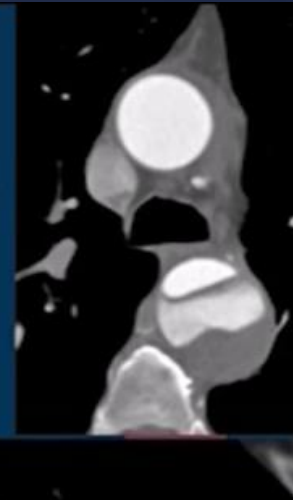
IVC-Balloon occlusion:

- * Inflate within the right atrium!
- * Pull into IVC-ostium
- * Aim at drop-shape
- * Keep the pulling (requires an extra hand: e.g. scrub-nurse)
- * Start a clock: half MAP or maximum pressure drop in 1 min.
- * After deployment release pulling, empty balloon, allow anaesthetist to start inotropic drugs.
- * Allow same time to raise the BP than it took to drop it.





Preoperative
CTA



Take Home:



- * Tip-capture alone is not enough! The graft should be fixated and constrained.
- * Cardiac output reduction prevents windsocketing – Not bloodpressure reduction !!!
- * IVC-occlusion works by reducing the venous return to the heart.
- * IVC-occlusion is well tolerated and easy to understand and use.
- * Use technique, which your anaesthesia is used to.
- * Some miraculous Type 1/5 Endoleaks may be Retroflexion-cases.