



SYMPOSIUM: EVAR imaging for a safer
treatment

**Preconditioning bevor EVAR with
multimodality imaging for embolisation
of aortic side branches (ASB)**

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Disclosure

Speaker name:

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest



Why embolisation of aortic side branches?

- Surgical or endovascular thoracoabdominal aneurysm repair leads to irreversible spinal cord injury in up to 20%
 - Embolisation of ASB before aneurysm repair induces collaterals and potentially prevents spinal cord ischaemia ¹
- Up to 33% of patients develop Typ 2 endoleak (T2EL) after EVAR
 - Pre-emptive embolisation of ASB reduces significantly the risk of T2EL ²

¹ Branzan et al. EuroInterv 2018

² Alerci et al. J Endovasc Ther Oct 2013

Challenge of embolisation procedure

- Prevent spinal ischaemia: 1-2 sessions, median 5 (1-19) ASB embolised, mean procedure time 112 min, mean radiation time 36min, mean CM 101ml
 - **No spinal ischaemia in 55 procedures**
- Prevent T2EL: 1-2 sessions, mean 4 LA and always IMA, procedure time 45-150min, CM 120-150ml
 - **3,6 % T2EL vs. 47,8 % T2EL**

¹ Branzan et al. EuroInterv 2018

² Bonvini et al. J Endovasc Ther Oct 2013



Problem: Localization of ASB can be difficult

Leading to long intervention/fluoro time and high cm consumption .

So how to improve the procedure?

- Better reconstruction of pre-op imaging (thin slicing, VR, MIP)
- Image fusion (2D to 3D registration)
- **Intraoperative CT imaging with automatic overlay**

Angio-CT workflow for ASB embolisation

Start with CT run

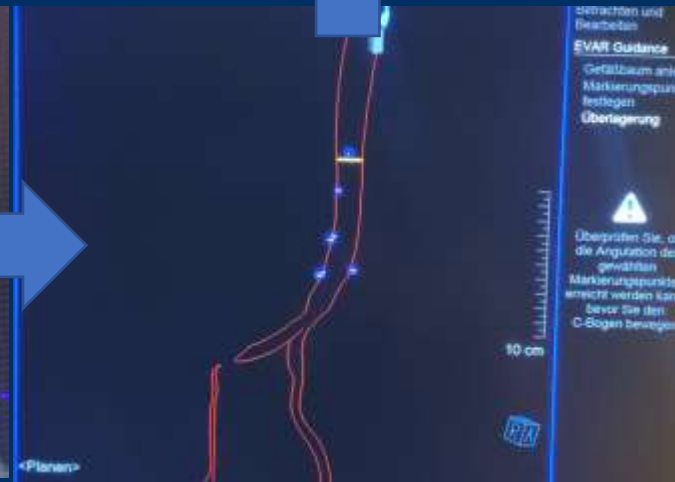
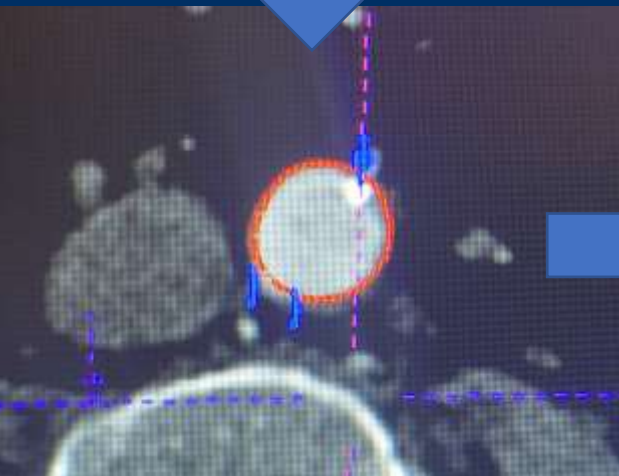
- 100ml intraaortic cm injection
- dilution 1:10 = 20ml and 10ml/s with dual head HP-injector)



Automatic overlay

Angio-CT workflow

Identification of ASB



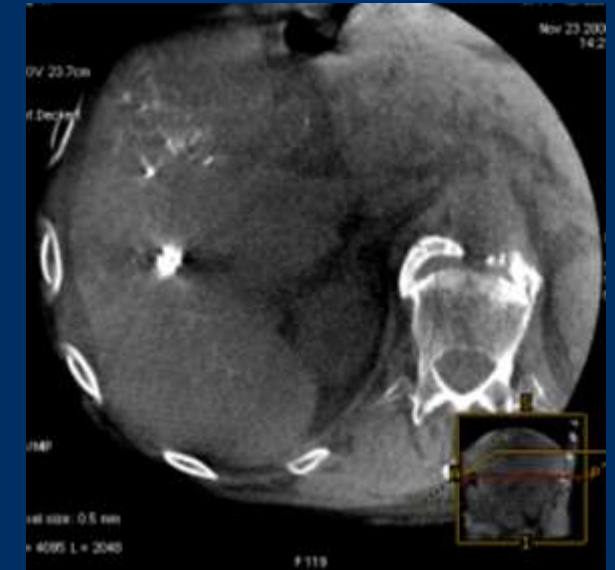
Marking of ASB

3D model based EVAR guidance

advanced catheter guidance

CB-CT vs. Angio-CT

	CB-CT	Angio-CT
Contrast resolution	5-10 HE	1 HE
Contrast dilution	1:1	1:10
Spatial resolution	max. 2000 ²	512 ²
Temporal resolution	low	high
CM Phase	single-double	multiple
Single slice imaging	difficult	easy
Speed incl. prep	90 sec	20 sec
Breath hold	yes	no
Post-processing	more	less
Scan range - coverage	Fixed to ~ 25cm	Flexible up to ~ 120cm
FoV	max. 30cm	~50cm
Isocentering	tricky	easy
Dose	high	ca. 40% of CB-CT ¹



Take home

- Pre-operative embolisation to prevent spinal injury or T2EL can be recommended
- Conventional procedure is time consuming, radiation & cm intense
- 3D image overlay or use of Angio-CT is applicable in clinical routine

Thank you!