

**Artery of Adamkiewicz—Noninvasive diagnosis
Cardiatiss/TehMED**

Artery of Adamkiewicz – Noninvasive Diagnosis

Assessment of the artery of Adamkiewicz is considered crucial ahead of the thoracoabdominal aortic repair. New advanced contrast enhanced CT and MR techniques allowed detectability of the artery as well as its collateral circulation.

Identification of the artery of Adamkiewicz is crucial in patients with thoracoabdominal aortic aneurysm disease in order to reduce the risk of post-operative spinal cord ischemia and paraplegia (5-10% of cases). The artery of Adamkiewicz is the most dominant radiculomedullary artery with a diameter of 0.8-1.3mm, with its characteristic hairpin turn configuration.

Selective X-ray angiography results in 43-86% of depiction range of the artery of Adamkiewicz, but results in an unacceptable level of 2% of peri-procedural complications. Hence a none-invasive scanning technique is required.

CTA recommended scanning parameters are: MSCT (64 of 128 channels): 120kVm 400mA, 0.5 mm section thickness, 0.75 sec rotation speed. Scanning level: from 7th Th to 2nd L vertebrae. Injection rate: 2ml/kg body weight Iopamidol with 3.5 ml/sec. The scan delay should be done in accordance with the contrast arrival triggering (either automatically or manually performed).

MRA recommended scanning parameters are: 1.5T MR, 3D fast spoiled gradient-echo sequence with a chemical shift selective fat suppression technique; 1mm partition technique, 0.5mm reconstruction interval, 18msec repetition time, 2.1 msec echo time, 40° flip angle, 32 Hz acquisition bandwidth, 168x240 mm FOV, 384x512 matrix.



74 YO male, CTA revealed TAA. 3D VR image shows artery of Adamkiewicz at the level of 10th thoracic vertebra. CPR shows communication between the aorta and the anterior spinal artery via the artery of Adamkiewicz

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Special points of interest:

- CTA and MRA provide good visualization of the artery of Adamkiewicz, considered crucial in pre-interventional preparation of thoracoabdominal aortic aneurysm repair.
- Aortic arch surgery often results in debris release into the intracranial circulation. A good brain protection strategy has to be developed.

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**We are on the web:
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TehMED— Who Are We?

TehMED is a young and dynamic company based in Ljubljana - Slovenia. TehMED is the certified distributor of the Cardiatis (Isnes, Belgium) products for the Slovenian market. The company is primarily focused at the distribution of the medical products, used in the interventional radiology and minimally invasive surgery. Presentation of the Cardiatis product range can be done upon request to the Commercial and Marketing Department of the TehMED company (see the contact data to the left).

Aortic Arc Surgery - need for Brain Protection

Brain protection is considered very important while carrying out complex aortic arc surgeries. The cerebral problems are primarily caused by the following two problems:

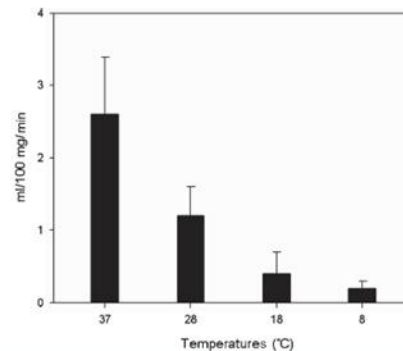
- Global injury due to inadequate brain perfusion during surgeries
- Focal injury caused by debris being released during the surgery and trapped in one of the cerebral vessels

Following treatment strategies are used for cope with the mentioned clinical complications:

- Hypothermia - reduction of cerebral metabolism by lowering patient's temperature. It has to be done controlled and for a limited period of time (in accordance with existing guidance's). Experimental work on Yorkshire pigs showed that cerebral metabolism is reduced down

to 50% when the temperature is lowered to 28° Centigrade and to 19% at 18° Centigrade. However, there is a serious concern that hypothermic circulatory arrest of longer than 30min can lead to serious cerebral injury and cognitive impairment.

- Retrograde cerebral perfusion - infusion of cold blood in the superior vena cava



Cerebral metabolism at various hypothermic temperatures in juvenile Yorkshire pigs (American Thor Surgery 2002)

(decreased in utilization lately)

- Selective cerebral perfusion
- Focal injuries are directly connected to the particularity of the used surgical techniques. The most important concern is to avoid release of atheroma or clot into the cerebral vessels or timely removal of surgical debris if ending up in the intracranial circulation. This is of an utmost importance in patients with atherosclerotic aneurysms. There are some indications that axillary artery perfusion results in less intra-procedural complications than in the case of aortic or femoral cannulation.

Cerebral protection has significantly advanced during the last 10 years and in some major surgical centers the arch resections are performed with mortality and stroke rates of less than 5%.