70TH ESCVS CONGRESS
& 7TH IMAD MEETING
20 I 23 JUNE 2022

Is intercostal artery reattachment during open TAAA repair really and definitively justified?

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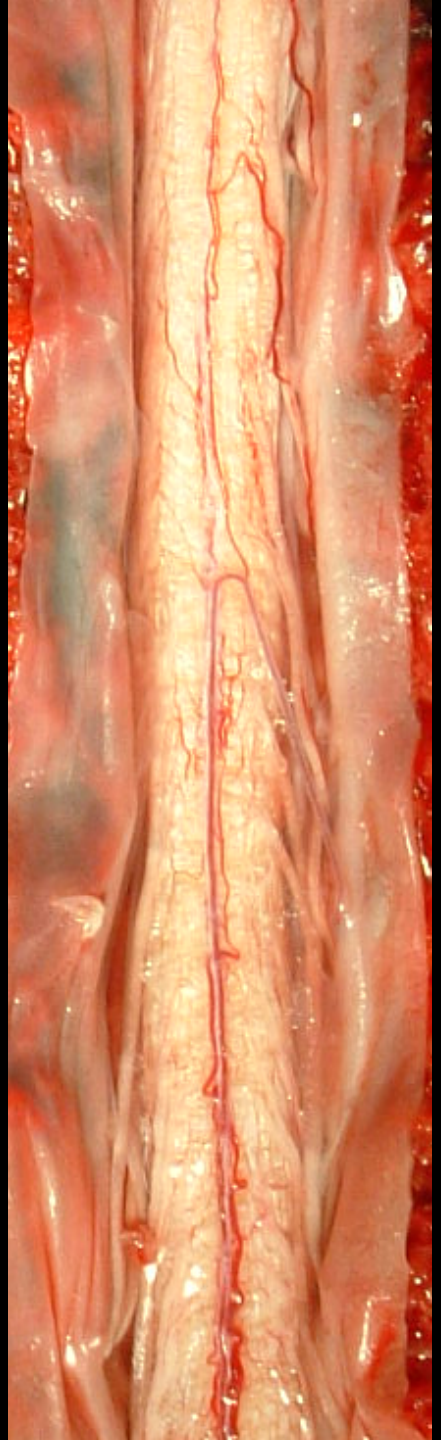
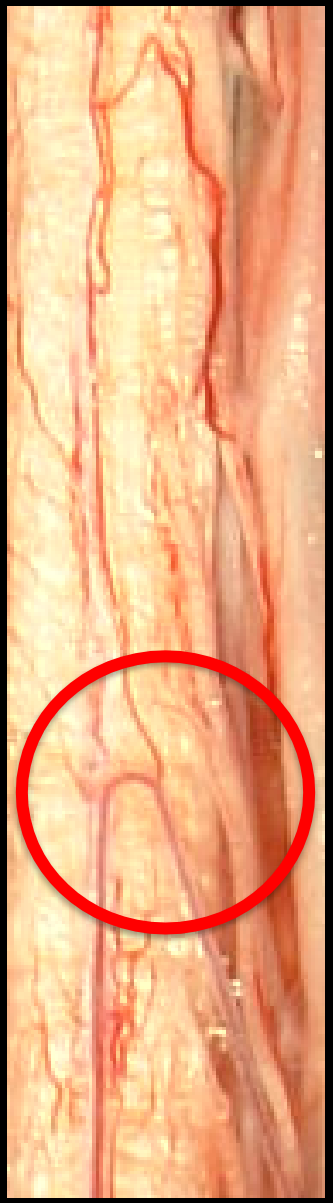
NOTHING TO DISCLOSE

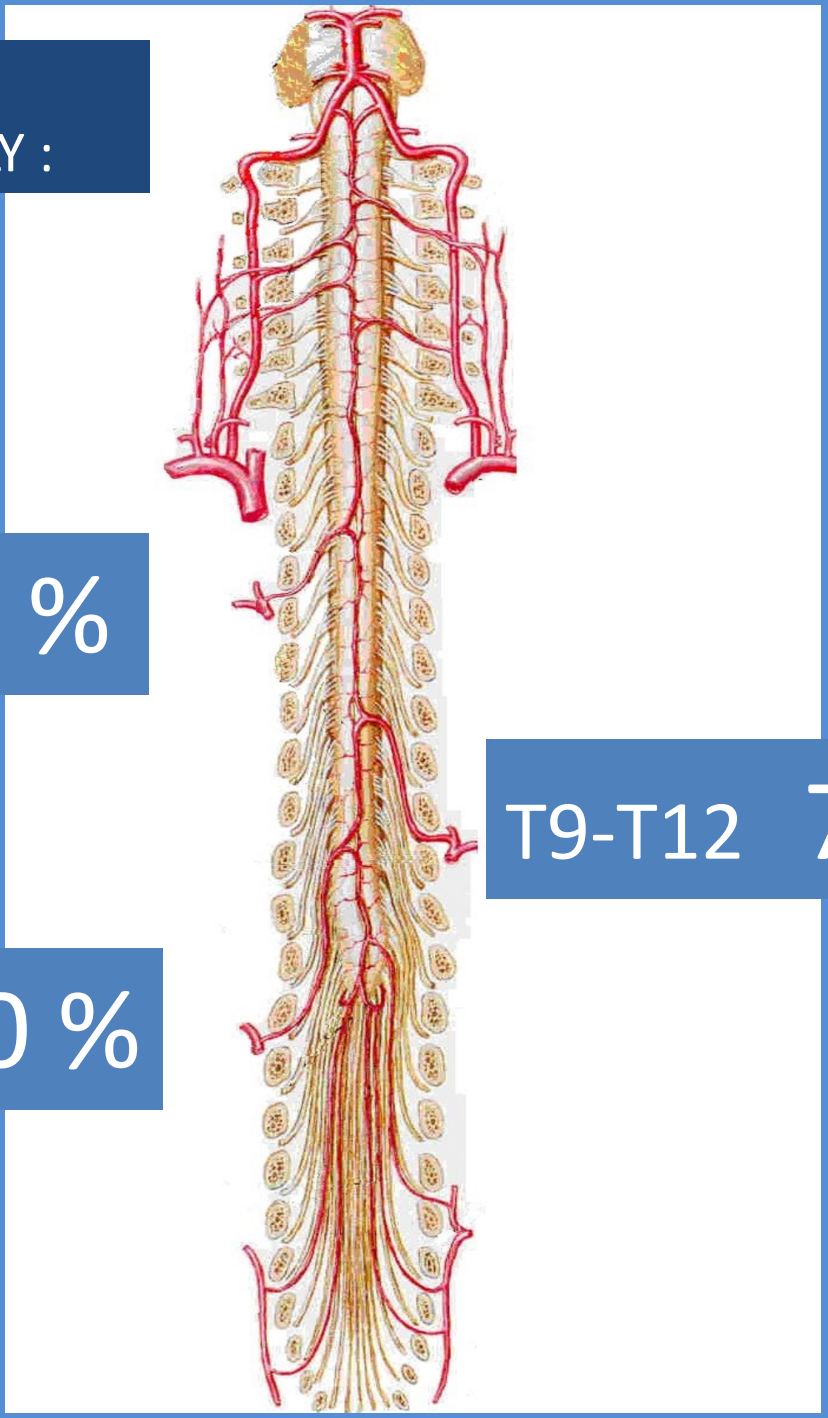




TRADITIONAL CONCEPT OF SPINAL CORD BLOOD SUPPLY :

THE MAIN RADICULO-MEDULLARY ARTERY (Adamkiewicz) ENTERS THE VERTEBRAL CANAL

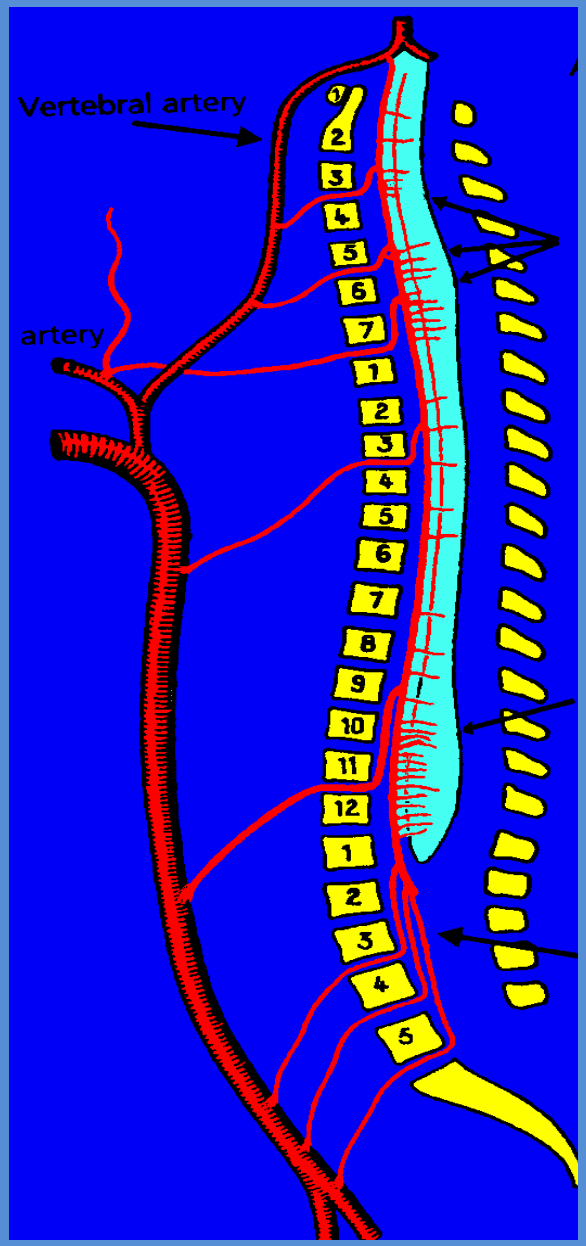
T5-T8 15 %



T9-T12 75%

L1-L3 10 %

Spinal cord vascularization



Critical level

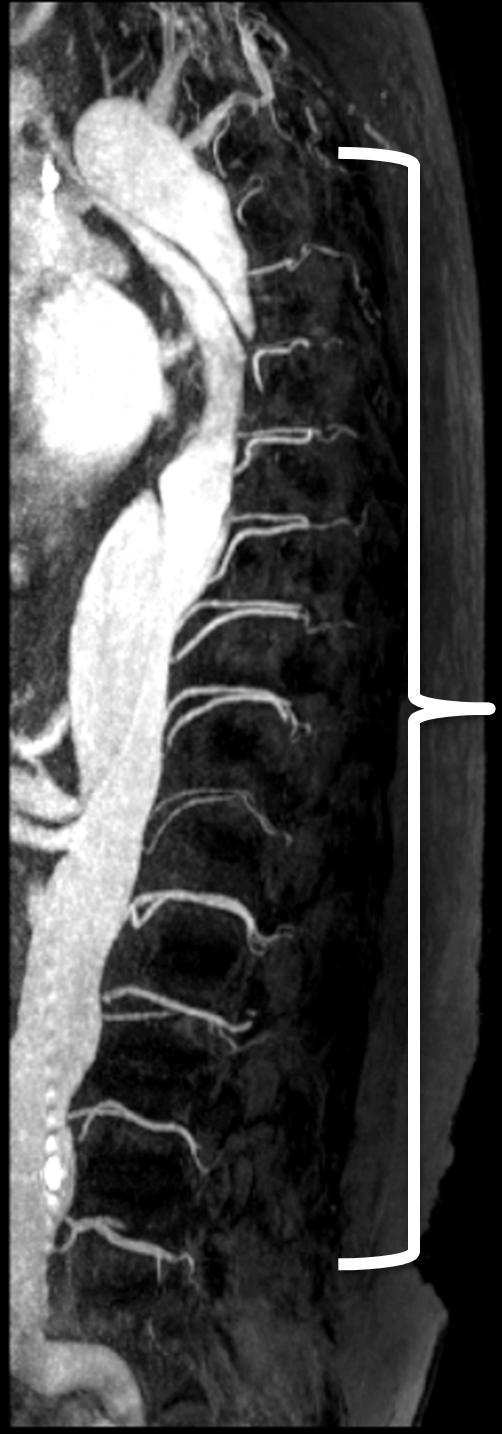
4 %

72 %

16 %

8 %

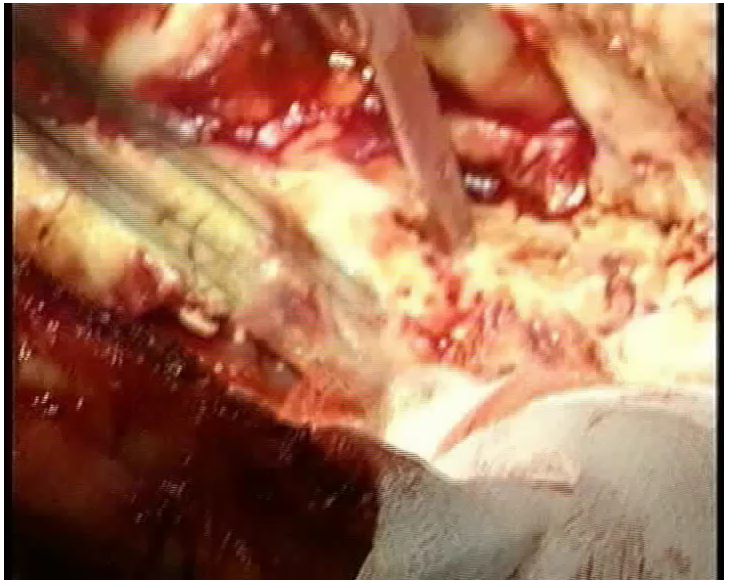
Post dissection vs degenerative TAAA



Patent segmental arteries

Occluded segmental arteries; collaterals

Shaggy thoraco-abdominal aorta: only one single open intercostal artery



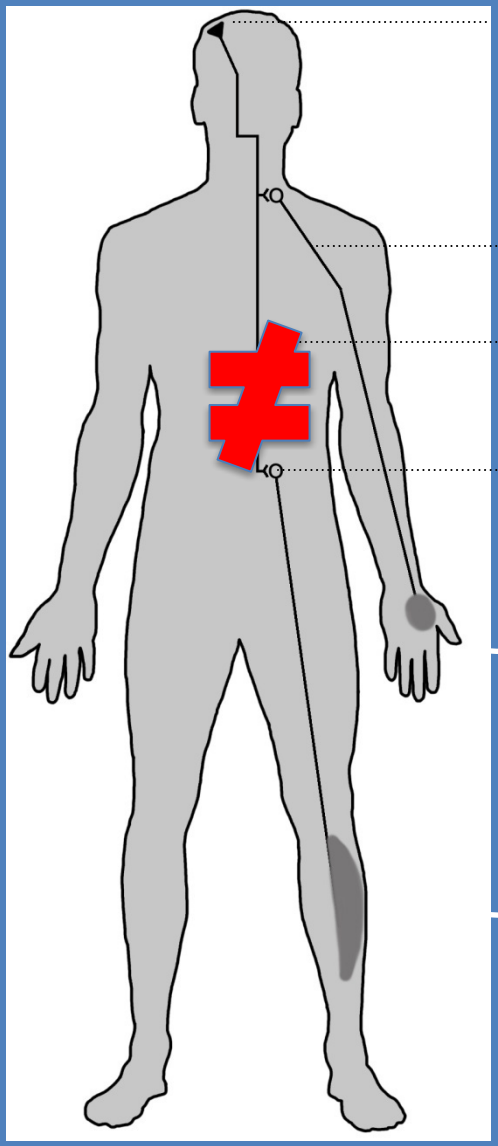
Is this intercostal artery important?

TAAA

- Spinal cord perfusion is totally changed
- Collateral network takes over
- Anatomy of feeding arteries becomes irrelevant
- It is all about function
- Very high variability
- Unpredictable

N75YR
N75YR
CHRONOMETER
SELECT
CONTROL
DAYTRON
MB800

electrical stimulation
500 V; ~1.2 A, 5 serial stimuli



pyramidal cell
in motor cortex

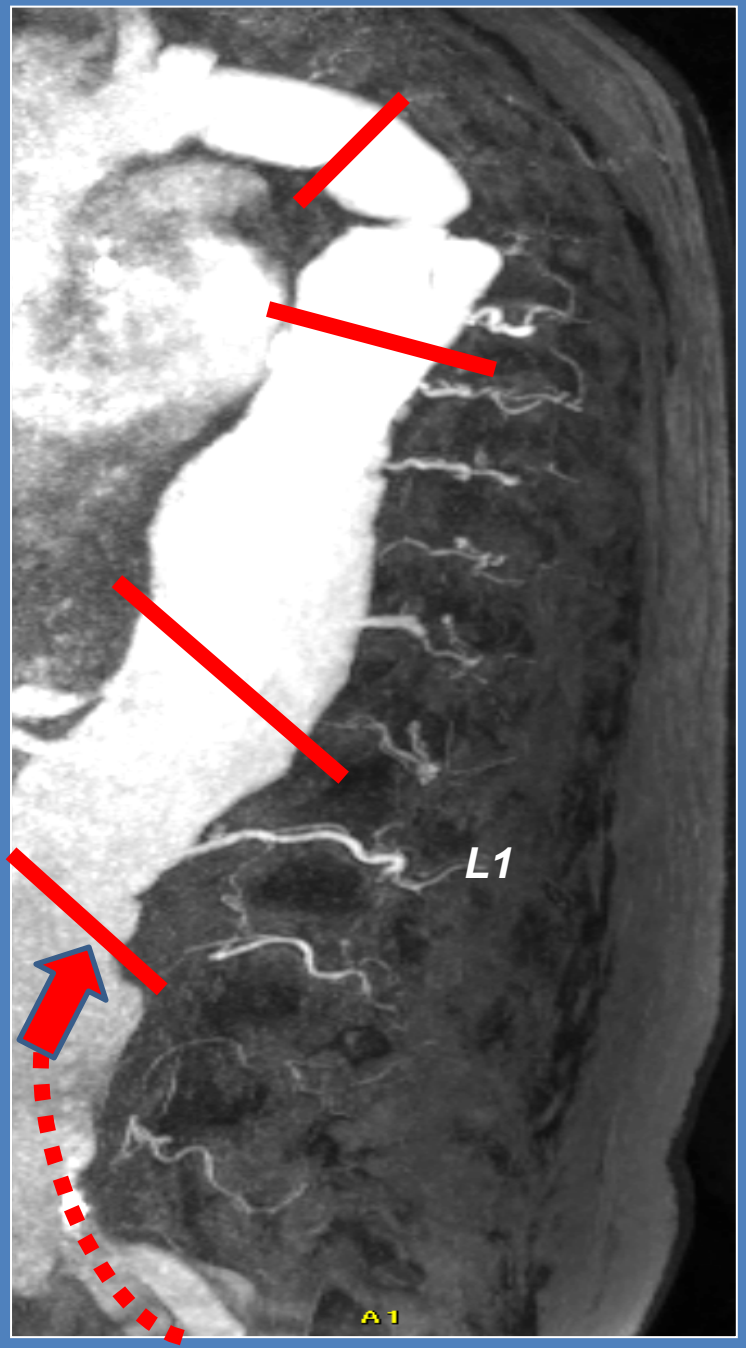
peripheral nerve

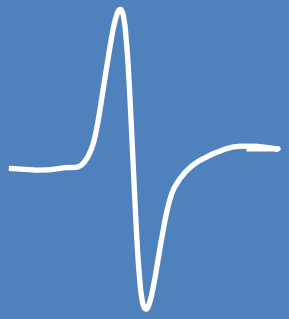
pyramidal tract

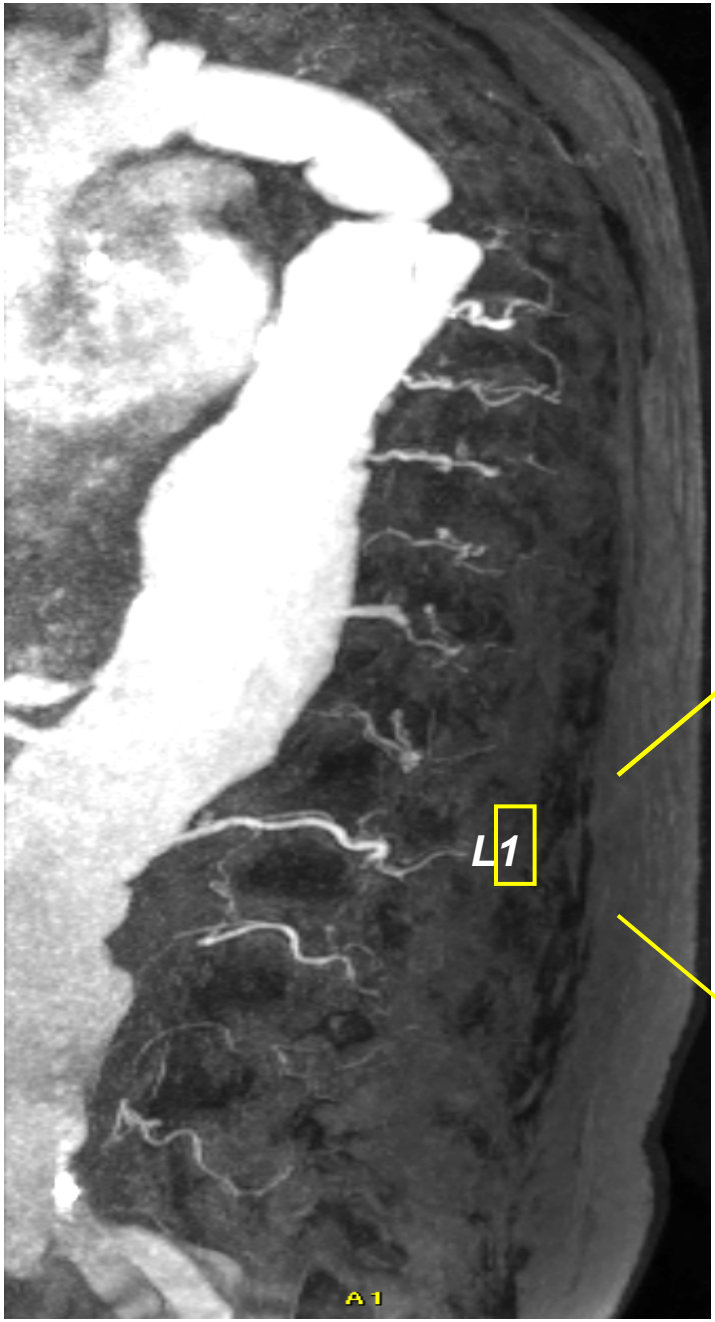
alpha motor neuron in
anterior horn of spinal cord

MEP response
abd. poll. brevis muscle

MEP response
tibialis anterior muscle


L1
A1





Magnetic resonance angiography and neuromonitoring to assess spinal cord blood supply in thoracic and thoracoabdominal aortic aneurysm surgery

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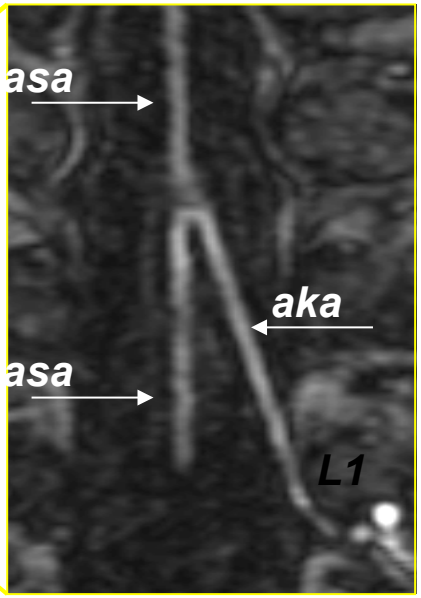
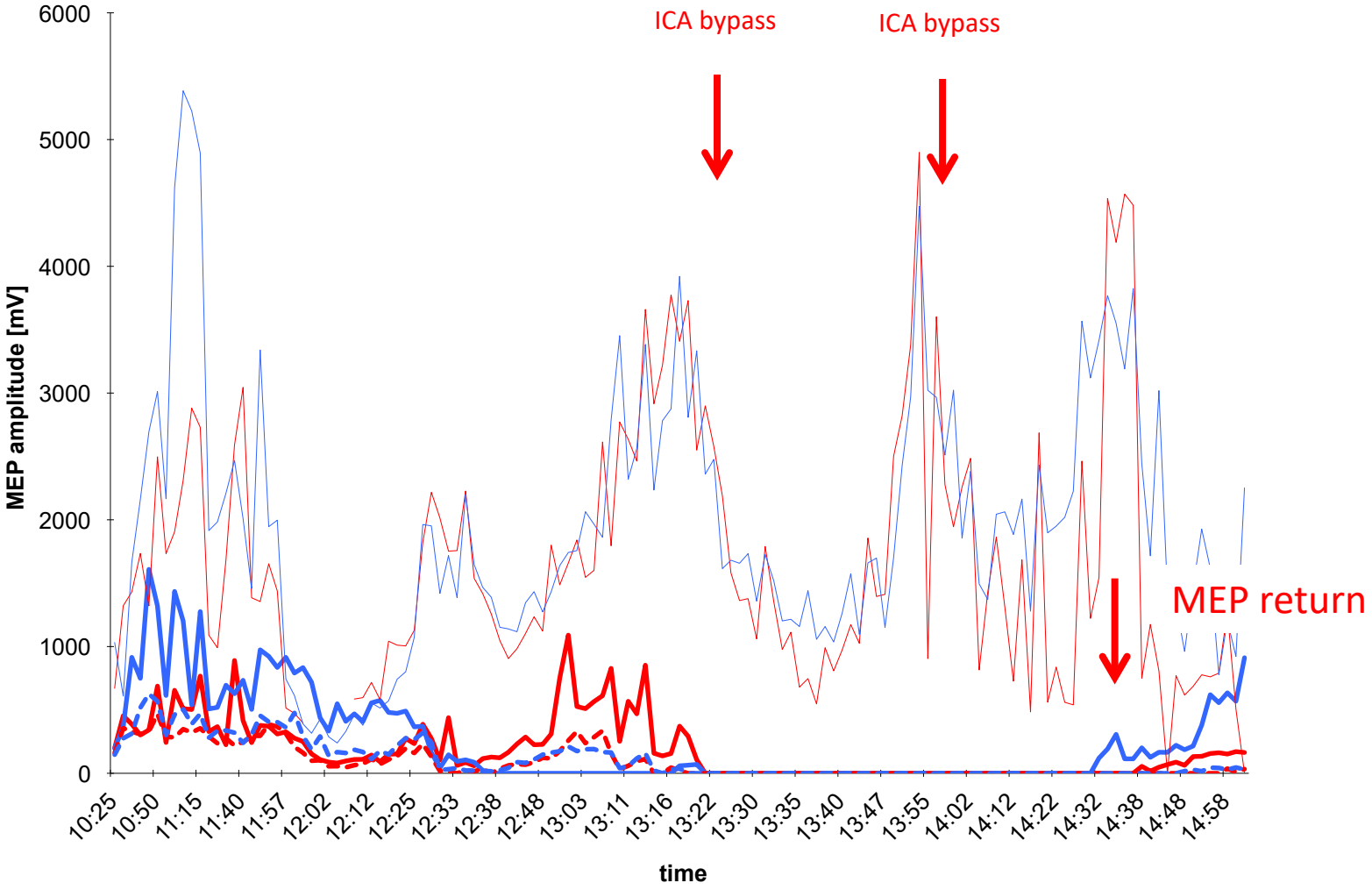
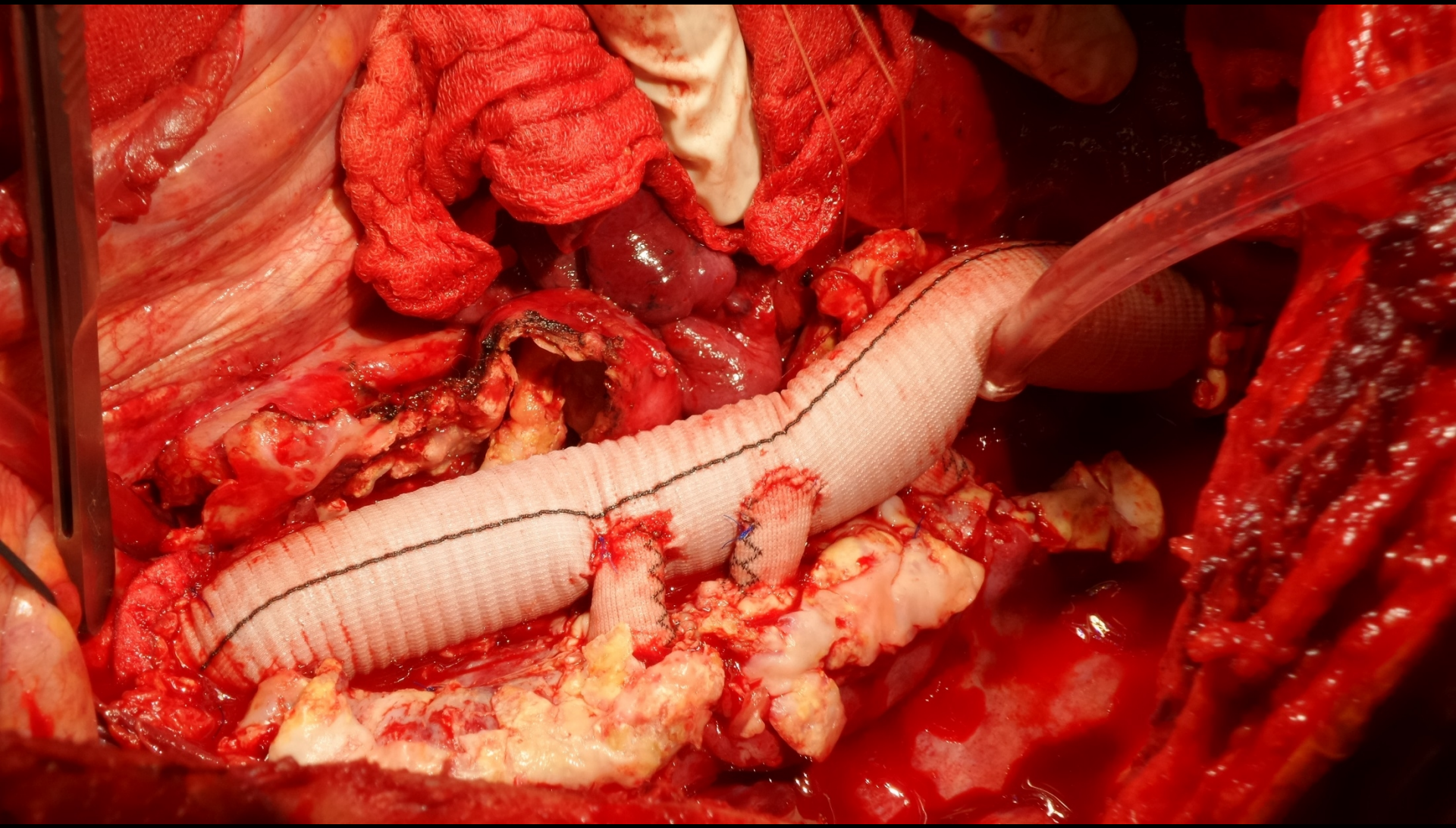
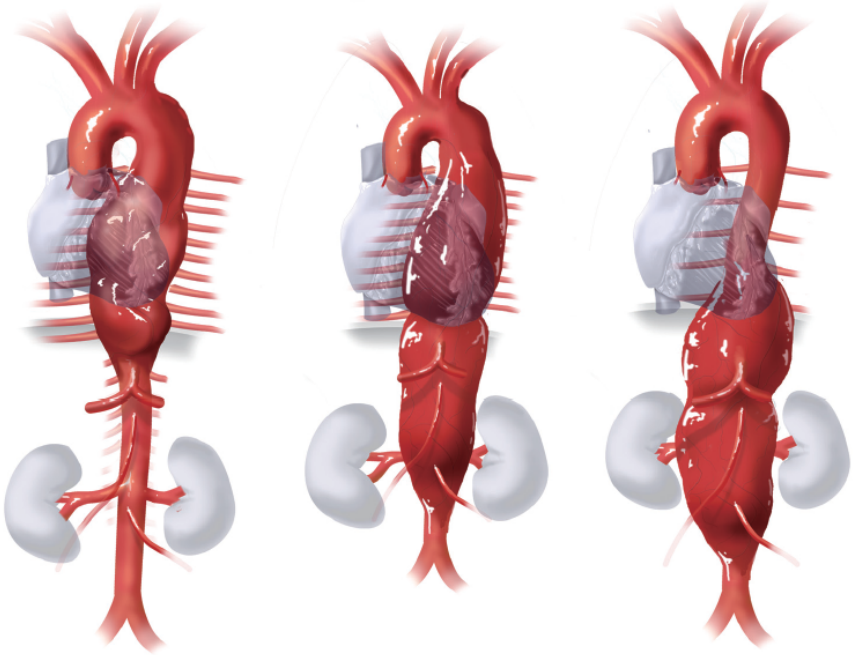
J Vasc Surg 2007;45:71-8




ICA bypass
ICA bypass
MEP return
MEP amplitude [mV]
6000
5000
4000
3000
2000
1000
0
time
10:25
10:50
11:15
11:40
11:57
12:02
12:12
12:25
12:33
12:38
12:48
13:03
13:11
13:16
13:22
13:30
13:35
13:40
13:47
13:55
14:02
14:12
14:22
14:32
14:38
14:48
14:58
tib.ant.R
tib.ant.L
abd.poll.br.R
abd.poll.br.L
rect.fem.R
rect.fem.L



MEP monitoring during open TAAA (>800 procedures)



- ✓ 0 false positive
- ✓ 0 false negative
- ✓ 100% correlation with outcome
- ✓ < 4% paraplegia

Summary

- Monitoring motor evoked potentials (MEPs) provides 100% reliable information on spinal cord function
- MEPs identify spinal cord ischemia and guides surgical interventions to restore function
- Management of segmental artery revascularization based on MEPs reduces spinal cord ischemic events