INNOMINATE STEAL SYNDROME
A HYBRID APPROACH

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Disclosure

Speaker name: Nelson Camacho

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
Flow inversion of a segment or the entire carotid axis, on duplex scan, caused by a stenosis or occlusion of the innominate artery

Rare

2.5-4% of atherosclerotic lesions of extracranial and intracranial cerebral arteries

20 cases in 30000 patients studied

Literature case reports
Innominate steal syndrome – a hybrid approach

Hemodynamic findings on duplex scan
- reversed or bidirectional flow in the right vertebral artery
- midsystolic deceleration or total reversed flow in any of the branches of the right carotid axis
- elevated left CCA/right CCA ratio

Usually symptomatic
- posterior fossa
- hemispheric cortex
Innominate steal syndrome – a hybrid approach

- 64-years-old male
- Admitted with **dizziness, nausea, paresthesia and claudication on right arm**, in the last 48 hours
- History of smoking habits
- Physical examination revealed **absence of right carotid and right upper limb pulses**, systolic pressure was 105 mmHg on left arm and 65 mmHg on right arm.
- Cranioencephalic computerized tomography excluded acute ischemic lesions or others relevant changes
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- Dupplex scan:
  - severe stenosis of the innominate artery (PS 384 cm/s)
  - occlusion of right vertebral artery
  - total flow inversion of the right ICA
  - partial endosystolic flow inversion of right CCA
  - low amplitude anterograde flow of right ECA
  - no significant lesions were found on the left carotid axis.
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- Computerized tomography angiography:
  - pre-occlusive stenosis of the innominate artery by a calcic lesion
  - excluded significant carotid lesions
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- ultrasound-guided puncture of right brachial artery and surgical exposure of right CCA
- carotid and axillary retrograde endovascular access was obtained
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  - 6x57mm covered balloon-expandable stent on the right CCA
  - 7x57mm uncovered balloon-expandable stent on the right subclavian artery
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- direct removal of embolic material was performed prior to declamping
- good permeability of the revascularized arteries was verified
Innominate steal syndrome – a hybrid approach
The postoperative period was uneventful and patient was discharged 3 days later.

Control CDS (1 week after surgery): revealed good permeability of the revascularized axis, with normal anterograde flow through right ICA and CCA.
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- Control CTA (1 month after the surgery):
  - good permeability without stents displacement
Innominate steal syndrome – a hybrid approach

Importance of CDS for diagnosis of important proximal lesions on supra-aortic vessels

Hybrid approach (percutaneous endovascular and surgical exposure) with stent placement in high-grade stenosis of the IA is a viable alternative to open bypass surgery, with good clinical results and high patency rates

- Complete cerebral protection
- Minimal morbidity
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