How To Prevent Particulate Embolic Strokes During TEVAR: How Do The Protection Devices Work And When Should They Be Used

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Disclosures

- Educational & Research funding from Gore Medical
TCD HITS

- Pre-operative
- Wire/catheter exchange
- Stent graft deployment

TCD HITS Relate To Aortic Atheroma Severity

- Atheroma grade 4-5 > grade 1-3
- p=0.042

TCD HITS Relate To Landing Zone

- Zones 0/1 > Zones 3/4
- p=0.001

TCD HITS Relate To Cerebral Outcomes

- MRI outcomes

TCD HITS Relate To Procedural Phases Of TEVAR

Can we reduce particulate embolisation during TEVAR?

Cerebral Embolic Protection During TAVR: A Clinical Event Meta-Analysis
JACC 69 (4) 463-70
Cerebral embolic protection in thoracic endovascular aortic repair

Abstract

Background: There have been a number of reports in the literature concerning cerebral embolism during thoracic endovascular aortic repair (TEVAR). This study aimed to evaluate the incidence and severity of cerebral embolism during TEVAR.

Methods: The study comprised a retrospective analysis of patients undergoing TEVAR with cerebral protection devices. The incidence and severity of cerebral embolism were recorded and analyzed.

Results: A total of 40 patients were included in the study. The incidence of cerebral embolism was 25%. The severity of embolism was assessed using a modified Rankin Scale (mRS). The mRS scores were as follows: mRS 0: 6 patients, mRS 1: 12 patients, mRS 2: 8 patients, mRS 3: 7 patients, mRS 4: 5 patients, and mRS 5: 4 patients.

Conclusions: Cerebral embolism during TEVAR is a significant complication. The use of cerebral protection devices can reduce the incidence and severity of cerebral embolism.

What Was Retrieved From The Filters?

- 10 Proximal, 9 distal filters: 99% contained debris
- Median no particles: 937 (146-1687)
- Median SA=2.66mm²

Acute thrombus (95%), arterial wall (85%), foreign material (32%).

DW MRI Post-TEVAR Infarction

- Protected: 7/9 (78%) 23 new lesions
- Total SA=379mm²
- Median SA=6mm² (1-16)

- Unprotected: 9/12 (75%) 55 new lesions
- Total SA=1534mm²
- Median SA=16mm² (3-103)

Procedural Embolization: Gas vs Solid

- Maximum NUMBER of TOTAL HITS – CEPD 95% gas 5% solid
- Maximum proportion of SOLID HITS – Wire&pigtail 23% solid, Stent deployment 18%

Conclusions

- TEVAR causes significant solid and gaseous cerebral embolisation
- Cerebral embolisation causes cerebral infarction — overt and covert
- Sentinel protection system reduces particulate embolisation
- To achieve total cerebral protection need to deal with:
  - L SCA
  - Gaseous embolisation