Endovascular Treatment for Acute Carotid Occlusion

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Outline

• Cases
• Etiology
• Evidence
  – Tandem
  – Cervical
• Techniques
• Medications

Disclosures

• None

CASES
ETIOLOGY
ACO: Etiology

- Atherosclerosis
- Atrial fibrillation
- Dissection
  - 3/100K/year
  - 5 - 20% of stroke < 45 years age
  - Younger (< 60 years)
  - Male
- Causes
  - Spontaneous (37%)
  - Trauma (48%)
    - 0.7% MVC
    - Mortality – 14%
    - CAS – 4% (no effect on mortality/LOS)
  - Iatrogenic (16%)


EVIDENCE

ACO: Tandem

- Goyal et al. (Lancet, 2016)
  - Meta analysis – 1287 pts
    - 68 years
    - NIHSS 17
    - 4.4% sICH
    - 15.3% Mortality
    - 21% ICA occlusion (274 pts)

  - 45.9% mRS ≤ 2


ACO: Tandem

- Goyal et al. (Lancet, 2017)
  - Meta analysis – 1287 pts
    - 9.5% Tandem occlusion (122) : MR CLEAN (75), ESCAPE (21), REVASCAT (19), EXTEND IA (7)

  - 27.8% mRS ≤ 2
  - 45.9% mRS ≤ 2

ACO: Cervical

- Paciaroni et al. (J Neurology, 2015)
  - ICARO-3 study – 648 pts (non-randomized)
    - 65 years mean age
      - median NIHSS 16
      - 11 - 14% dissection
    - IVT vs. EVT (16% stent, 66% IA tPA)
      - 27% vs. 32% mRS ≤ 2, p = 0.1
        - 27 vs. 35% mRS ≤ 2, p = 0.05 adjusted for non-dual tx
    - Complications
      - 17% vs. 37% sICH, p = 0.0001
      - 23% vs. 18% mortality, p = 0.07

ACO: Mixed

- Gliem et al. (PLOS ONE, 2017)
  - 78 pts
    - 43 cervical only, 35 Tandem (6 dissection)
    - Overall
      - Cervical (43): median NIHSS 8; 58% mRS ≤ 3
      - Tandem (35): median NIHSS 16; 29% mRS ≤ 3, p < 0.001, p = 0.01.
      - sICH
        - 4.3% vs. 29% (IV vs. EVT)

ACO: Mixed

- Gliem et al. (PLOS ONE, 2017)
  - 27 non-treated
    - Cervical (21): 67% mRS ≤ 3
    - Tandem (6): 0% mRS ≤ 3, p = 0.006
  - 51 treated
    - Cervical (22)
      - IV (10): 40% mRS ≤ 3
        - IV+EVT (12): 58% mRS ≤ 3; p = 0.67
      - Tandem (29)
        - IV (13): 8% mRS ≤ 3
        - IV+EVT (16): 57% mRS ≤ 3; p = 0.008
ACO: Technique

- IA thrombolysis
- Angioplasty
- Stenting
- Approach
  - Proximal-to-distal
  - Distal-to-proximal

ACO: Technique

- Access
  - 10F sheath
- Triaxial system
  - 9F Balloon guide
  - ≥ 5F intermediate/aspiration
  - 0.027 microcatheter
    - 0.14 – 0.16 microwire
- Technique
  - Define true lumen
  - Distal access ≥ 5F intermediate/aspiration


ACO: Technique

- Marnet et al. (AJNR, 2016)
  - 57/258 pts (22% Tandem)
    - 8% dissection
    - 63 years mean age
      - 52 vs. 67 (dissection vs. non-dissection), p < 0.05
    - Median NIHSS 17.5
    - Complications
      - 5% sICH
      - 19% Mortality

- Lockau et al. (Neuroradiology, 2015)
  - 37/245 pts (15% Tandem)
    - 35% dissection
    - 63 years mean age
      - 52 vs. 68 (dissection vs. non-dissection), p < 0.01
    - Median NIHSS 17
    - Outcome
      - 73% TICI 2b/3
      - 46% mRS ≤ 2
    - Complications
      - 11% sICH
      - 19% Mortality

- Marnet et al. (AJNR, 2016)
  - 57/258 pts (22% Tandem)
    - Distal-to-proximal approach
      - 25% dissection cases required stent
      - Dissection vs. Non-dissection
        - 70% vs. 82% TICI 2b/3
        - 70% vs. 50% ≤ mRS 2

- Lockau et al. (Neuroradiology, 2015)
  - 37 pts
    - 32% Proximal-to-distal
    - 68% Distal-to-proximal
      - PTD vs. DTP:
        - 110 min vs. 43 min, p < 0.001
        - 33% vs. 52% mRS ≤ 2, p = 0.319
ACO: Medication

- Antiplatelet
  - Procedure vs. post-procedure
  - Single vs. dual
  - IV
  - PO/NG/PR

Xian et al. (JAMA Neurology, 2016)
- 85,072 pts (IV tPA)
- 45.7% (38,844) antiplatelet +
  - 5% vs. 3.7% sICH
    » AOR 1.19 ASA
    » AOR 1.47 ASA and Clopidogrel
  - 2% antiplatelet > non-antiplatelet, mRS ≤ 1
    » AOR 1.14

Conclusions

- Acute carotid intervention is safe and effective
  - Time to revascularization - Brain
  - Mechanical thrombectomy
    • Avoid IA thrombolysis
- Dissection vs. other
- Stenting
  - Hemorrhage vs. thrombosis
    • Monotherapy first 24hrs
ACO: Tandem

- Sivan-Hoffman et al. (ER, 2017)
  - Meta analysis – 237 pts
    - 193 pts cervical stenting
    - Median NIHSS 17
    - 83% TICI 2b/3
    - 46% mRS ≤ 2
      - 13% mortality
      - 4% siICH

- Delgado et al. (JNIS, 2016)
  - Tandem
    - 87.5% TICI 2b/3
    - Complications (all)
      - 8% siICH
      - 21% emboli
        - 11% associated with ICA recanalization
      - 4% mortality

ACO: Mixed

- Delgado et al. (JNIS, 2016)
  - 24 pts (dissection)
    - 47 years mean age (± 13.5)
      - 79% male
      - median NIHSS 16
    - 11 cervical only, 13 Tandem
      - Cervical (11): 72% mRS ≤ 2
      - Tandem (13): 69% mRS ≤ 2

Thank you

Questions?
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ACO: Mixed

• Kurre et al. (INR, 2016)
  – 73/1603 pts (dissection, 4.6%)
    • 48 years mean age (31- 71)
      – 67% male
    • 29 cervical only, 44 Tandem
      – Cervical (29): median NIHSS 7; 79% mRS ≤ 2
      – Tandem (44): median NIHSS 12; 55% mRS ≤ 2, p = 0.002; 0.047


ACO: Mixed

• Kurre et al. (INR, 2016)
  – Tandem
    • 85% TICI 2b/3
      – 84% Proximal-to-distal
      – 48% complete
    – 16% Distal-to-proximal
  – Complications (all)
    • 5% sICH
    • 21% emboli
      – 11% associated with ICA recanalization
    • 10% mortality