What I Learned from a Complex Case of Endovascular Stroke Treatment

Italo Linfante MD, FAHA
Director Endovascular Neurosurgery
Interventional Neuroradiology
Miami Cardiac and Vascular Institute
Clinical Professor
Patient

- 74 year-old man
- Sudden onset of left arm and leg weakness with head and eyes deviation to the right and neglect
- Arrives to the ED 3 hours after symptom onset
- NIHSS 21
- In the angio room at 4 hours after symptom onset
CTA:
extracranial Right ICA occlusion
PLUS
Right MCA occlusion
(Tandem Lesion)
Prognosis in ICA Occlusions

- NIHSS > 21 relative risk of D&D of 92% (NINDS tPA investigators NE J Med 1998)
- Acute stroke secondary to extracranial ICA occlusion with MCA occlusion (Tandem) is a strong predictor of mortality
- ICA “T” occlusion 73% mortality only 3% have good outcomes (i.e. mRS <2) (Smith W et al, Stroke 2007; Nogueira et al AJNR 2009)
Predictors of Mortality

- Strongest predictors of mortality:
  - Failure to revascularize (OR, 0.28; 95% CI, 0.16 to 0.50; P<0.0001),
  - Internal carotid artery occlusion (OR, 2.17; 95% CI, 1.22 to 3.86; P=0.0084)

ICA Occlusions: Low Recanalization with IV tPA

- Clinical and Vascular Outcome of ICA vs MCA After IV tPA. Linfante et al Stroke, 2002;33:2066-7
- Tandem internal carotid artery/middle cerebral artery occlusion are independent predictor of poor outcome after IV tPA. (Rubiera M, Ribo M et al Stroke 2006;37:2301–5)
Acute ICA Angioplasty and Stenting with a Tandem ICA plus MCA occlusion
Acute ICA Stenting:

- 8F sheath, 8 F Balloon Guide catheter
- Angioplasty (4 x 20mm balloon) proximal protection with balloon guide catheter and aspiration
- Stenting (Precise 8x40;7x30 mm )
Acute ICA Stenting

- Microcatheter in the MCA
- Thrombectomy with Stent-Triever
Patient

- The day after:
  - Extubated
  - NIHSS of 3
  - mRS of 0 at 30 days
Patient

- 65 y/o man presenting with left hemiplegia, profound neglect (NIHSS 18) 2:30 min after symptoms onset
- Decreased level of consciousness
- Intubated for airway protection
- 0.9 mg/kg of IV tPA
- Cerebral Angiogram started 4-hours after symptom onset
Acute ICA Stenting:

- 8F sheath, 8 F Balloon Guide catheter
- Angioplasty (4 x 20mm balloon) proximal protection with balloon guide catheter and aspiration
- Stenting (Precise 8x40; 7x30 mm)
Acute ICA Stenting

- Microcatheter in the MCA
- Thrombectomy with Stent-Triever
Patient

- Day after:
  - NIHSS of 4
  - mRS = 0 at 30 days
Patient

- 64 year-old man
- Found in bed by his wife unresponsive at 6:30 AM
- NIHSS 23
ICA Dissections
Patient

- 40 year old woman found by her husband with aphasia and right hemiparesis
- Normal CT, IV tPA given within 1:15 min after symptom onset
- Initial improvement and then worsened, repeat CT unchanged
- Referred for angiography
- Angiogram started, approximately 2 hours after SO
CT 3 days later
Endovascular treatment of tandem vascular occlusions in acute ischemic stroke


Acute ICA Occlusion

- 28 consecutive patients
- Mean NIHSS 18
- Extracranial carotid occlusions with a concomitant middle cerebral artery occlusion were seen in 89.3% of patients (n=25)
- An antegrade approach (ie, treatment of the extracranial lesion first) was used in 24 patients (85.7%)
Tandem Lesions

- Proximal occlusion recanalization was achieved usually with angioplasty and stenting (n=27; 96.4%)
- ≥TICI 2A 96.4%
- mRS score of ≤2 at 90 days was achieved in 56.5% of patients
Acute ICA Occlusions

- High recanalization rates with angioplasty and stenting
- At times, proximal recanalization of the ICA results in recanalization of the MCA
- Tandem Occlusions: higher recanalization rates in MCA occlusions with new generation thrombectomy devices (i.e. Stent-trievers and/or Aspiration devices)
Conclusions

- Acute extracranial ICA occlusion is a strong predictor of mortality
- Plaque that ruptured or ICA Dissection
- Angioplasty and Stenting of acute ICA occlusions is technically possible and safe
- Most often tandem (ICA+MCA): high recanalization with stentriever or aspiration or stenting of the MCA
Patient

- 55 year-old man
- Sudden onset of slurred speech, disorientation, left arm > leg > face weakness
- Arrives to the ED 4.5 hours after symptom onset.
- On exam, head and eyes deviation to the right, profound neglect, left arm and leg plegia (NIHSS 19)
- In the angio room at 5.5 hours after symptom onset
- Decreased level of consciousness during the procedure requiring intubation
Failure to Recanalize the MCA

- Despite several passages we failed to recanalize the M1

- We then proceeded with stenting with Wingspan
Patient

- Day after:
- NIHSS of 5
- mRS of 1 at 30 days, NIHSS 2
Stenting in Acute Stroke Patients Who Failed Thrombectomy Devices

Linfante I, Samaniego E, Geisbüsch P, Dabus G

Long-term Results

- 42% mRS < 2
- 5 patients (26%) died; 3 patients from hemorrhagic transformation of the stroke
- Two died from large ischemic infarctions
ICA Occlusions

- Angioplasty +/- Stenting
- High recanalization rates in MCA occlusions with new generation thrombectomy devices (i.e. Stent-trievers and Aspiration devices)
- If new generation thrombectomy device fail to recanalize the MCA, stenting of the MCA is an effective option
Endovascular stent therapy for extracranial and intracranial carotid artery dissection: single-center experience

ICA Dissections

- 32 patients, 24 extracranial ICA dissections with common CA involvement (4), and extracranial ICA-intracranial ICA (16).
- Carotid artery occlusion was 100% in 15 cases (34.1%), 99% in 6 cases (13.6%), 70%-98% in 13 cases (29.5%), and < 70% in 10 cases (22.7%).
- Stent deployment was successful in 97.7%.
- Recanalization (TIMI 2 or 3) 95.5%.
- Procedure-related complications occurred in 7 patients
- At discharge, 36 patients (83.7%) had modified Rankin Scale scores of 0-2