

How to best treat an ICA occlusion with distal embolization: Sequence and Timing of Treatment: Technical Tips

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Treating ICA Occlusions with Distal Embolization

- Background
 - Anterograde vs. Retrograde Approach Towards Tandem Lesions
- The Buffalo Protocol
- Case Examples
- Case Video
- Conclusions

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<p>Anterograde</p> <ul style="list-style-type: none"> -Address the primary/causative lesion -Prevents distal emboli -Improve collateral restoration 	<p>Retrograde</p> <ul style="list-style-type: none"> -Shorter angiographic times -Open intracranial circulation first
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Endovascular retrograde approach may be a better option for acute tandem occlusions stroke

Dong Ding¹, Zhonghua Shi¹, Xiaolan Li¹, Zhenze Zhuo¹, Weiwei Zou¹, Huanhuan Wang^{1*}, Yongqiang Hou^{1*}, Fusheng Guo¹, Weidong Liu¹, Sidi Jia¹, Siman Song¹, Yuhua Liu^{1*}, on behalf of the ACTUAL Investigators

* Author information * Article notes * References

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Sixty tandem occlusion stroke patients were enrolled. Thirty-one (51.7%) patients received anterograde therapy, while 29 (48.3%) patients underwent the retrograde approach. Successful recanalisation (modified thrombolysis in cerebral infarction score 2b-3) occurred in 78.3% (47/60) of patients, and 50.0% (30/60) of patients achieved a modified Rankin scale score of 0-2 at 90 days. Patients undergoing the retrograde approach spent less time in distal occlusion recanalisation (125 (86-167) vs. 95 (74-122) minutes; $P = 0.04$) and achieved better functional outcomes at 90 days (69.0% (20/29) vs. 32.3% (10/31); $P = 0.004$) than patients who received anterograde therapy. The retrograde approach was associated with favourable clinical outcomes (odds ratio 0.21; 95% confidence interval 0.07-0.64; $P = 0.006$).

Conclusion

For acute tandem occlusion stroke, favourable outcomes were better in patients undergoing retrograde therapy than in patients who received the anterograde approach. Future randomised trials are warranted to determine the optimal treatment.

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Anterograde vs. Retrograde Stenting

Neurosurg Focus 2017

Management of acute ischemic stroke due to tandem occlusion: should endovascular recanalization of the extracranial or intracranial occlusive lesion be done first?

Leonardo Rangel-Castilla, MD,^{1,4*} Gary B. Rajah, MD,⁴ Hakeem J. Shakir, MD,^{1,5} Hussain Shallwani, MD,^{1,5} Sirin Gandhi, MD,^{4,5} Jason M. Davies, MD, PhD,^{1,2,3} Kenneth V. Snyder, MD, PhD,^{1,4,5,7} Elad I. Levy, MD, MBA,^{1,5,7} and Adnan H. Siddiqui, MD, PhD,^{1,5,8,9,10}

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Anterograde vs. Retrograde Stenting

Ischemic Stroke

REVIEW

Management of tandem occlusions in acute ischemic stroke – intracranial versus extracranial first and extracranial stenting versus angioplasty alone: a systematic review and meta-analysis

Mitchell P Wilson,¹ Mohammad H Murad,² Timo Krings,³ Vitor M Pereira,³ Cian O’Kelly,⁴ Jeremy Rempel,¹ Christopher A Hilditch,² Waleed Brinjikji^{1,5}

findings persist in larger pooled analysis. Our meta-analysis does demonstrate a slight trend toward an improved safety profile with an extracranial first approach including a 90-day mortality rate (8% [95% CI 3% to 15%] vs 15% [95% CI 3% to 32%]) and procedure-related complications (8% [1–20%] vs 20% [9–39%]), though these differences were not significant and

The Buffalo Protocol for Tandem Occlusions (Carotid and Distal Embolization)

Commentary: A multi-center study of the MicroNET-covered stent in consecutive patients with acute carotid-related stroke: SAFEGUARD-STROKE

Jaimis Lim¹, Vinay Jalkumani^{1,2}, Tyler A. Scullen^{1,3}, Adnan H. Siddiqui^{1,2,4,5}

The Buffalo Protocol

We have developed a stepwise anterograde approach towards tandem strokes, which is detailed here: An

Anterograde Approach with UPFRONT stenting

The Buffalo Protocol – DAPT and Setup

- Dual Antiplatelet Regimen
 - Give aspirin 325 mg daily and load ticagrelor 180mg via NG or OG tube
 - If NG or OG tube unable to be placed, give integrillin bolus (weight-based) – not preferred
- Setup
 - Access: 8F femoral
 - Guide catheter: Balloon guide catheter (Walrus, Q’Apel Medical, Fremont, CA)
 - Select catheter: (5F Simmons Select catheter, Penumbra, Alameda, CA, USA)
 - Guide wire: 0.035 Exchange or Advantage GlideWire (Terumo, Interventional, Somerset, NJ, USA)
 - Carotid occlusion crossing carotid wire (Spartanore GuideWire or Abbott High-Torque Command Workhorse; Abbott Vascular, Santa Clara, CA, USA)
 - Angioplasty Balloon (Aviator Plus PTA Dilation Catheter, Cordis, Miami Lakes, FL, USA)
 - Carotid Stent (Long length stent preferred) often 8x36 Wall

Walrus Balloon Guide for Carotid Stenting

CASE SERIES

- Allows flow reversal and protection from distal embolic showering when crossing the carotid lesion.

Carotid Artery Stenting Using the Walrus Balloon Guide Catheter With Flow Reversal for Proximal Embolic Protection: Technical Description and Single-Center Case Series

Authors: Justin M. Coenen, MD^{1,2,3,4}, Arsha Bhavsani, MD^{1,2,3,4}, Maheshwar Prasad, MD^{1,2,3,4}, Anand A. Bag, MD^{1,2,3,4}, Daniel J. Papanicolaou, MD^{1,2,3,4}, Tapan Deshpande, MD^{1,2,3,4}, Nancy S. Khanna, MD^{1,2,3,4}, Ron G. Hershkovitz, MD^{1,2,3,4}, Jason H. Davies, MD, PhD^{1,2,3,4}, Arthur D. Sittig, MD, PhD^{1,2,3,4}, Mark L. Levy, MD, PhD^{1,2,3,4}, Kenneth V. Saper, MD, PhD^{1,2,3,4}

The Buffalo Protocol - Stepwise

- Walrus Balloon-Guide Catheter is navigated to the common carotid artery proximal to the carotid occlusion
- BGC is inflated and catheter stopcock opened to create **flow reversal**
- Carotid wire is navigated past the occlusion into true lumen in distal cervical or intracranial ICA
- Angioplasty balloon is navigated into the proximal CCA
 - Angioplasty conducted and **“waisting” of the balloon will demonstrate location of “peak” stenosis**
 - Provides key area that needs to be stented
- Carotid stent is deployed
- Aggressive Aspiration followed by BGC balloon deflation
- Angiographic run after stent deployed
- After repeat diagnostic run, if carotid artery is still occluded, angioplasty and stenting of more distal carotid can be done until endovascular bypass and carotid/intracranial flow restored.
- Guide is advanced past the stent and parked in distal cervico-petrous ICA.
- Then distal intracranial clot is chased with preferred thrombectomy devices.

The Buffalo Protocol – Carotid Angioplasty

- Waisting of the angioplasty balloon during inflation demonstrates where the carotid artery is most stenotic/occluded.
- Provides central landing zone for carotid stent.
- “Waisting” (left) of balloon shows area of true stenosis

Revascularization of tandem left ICA and M1 occlusion

Adnan Siddiqui, MD PhD
Kunal Raygor, MD
Rosalind Lai, MD

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- Tandem lesions are the most disabling category of LVO AIS.
- Intracranial occlusions with a acute carotid occlusion is the most aggressive extreme of a symptomatic carotid stenosis.
- Balloon guides allow for adequate reversal of flow providing distal embolic protection during crossing, angioplasty and stenting of the carotid lesion to prevent further distal emboli.
- Post stenting the balloon guide can be rapidly advanced beyond the stenosis into distal cervical ICA for intracranial revascularization with stent retriever, aspiration or both.
- At Buffalo, we favor an antegrade approach for tandem occlusions.

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Thank You

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