

Case Report of Iatrogenic Carotid-cavernous Fistula Secondary to Endovascular Rescue of a Left M1 Occlusion in the Presence of a Cavernous Carotid Aneurysm Utilizing a Stent-Retriever

Andres M. Alvarez-Pinzon MD, PhD, MHA; Ali Reza Malek MD
Palm Beach Neurosciences Institute - Tenet Florida Physicians Services

Background

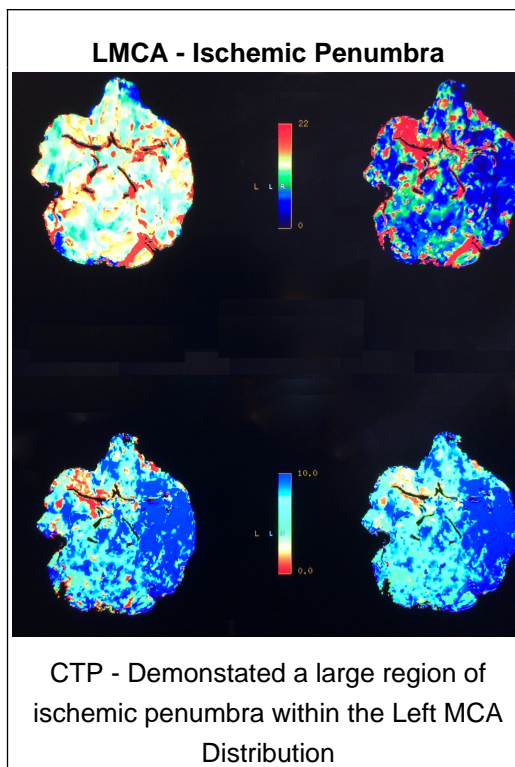
Iatrogenic Direct carotid-cavernous fistulas (CCFs) are uncommon complications of intracranial endovascular rescue. We describe the first reported case of an intraprocedural direct carotid cavernous fistula that developed immediately after flow restoration during treatment of an acute left M1 occlusion utilizing a Stent Retriever

Clinical Presentation

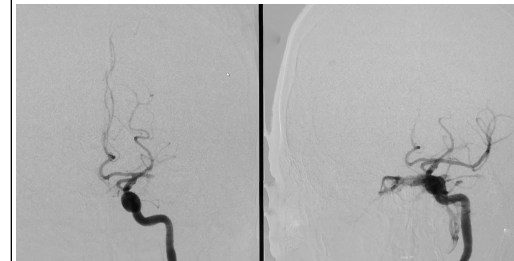
This was an 86 year old right handed Caucasian woman who presented with acute onset of aphasia, right sided weakness, and right facial droop.

- The time of onset was unknown. Neurologic examination was consistent with a left hemisphere syndrome, and NIH Stroke Scale/Score (NIHSS) on arrival to the ED was 16. She was found to have a previous medical history of Paroxysmal Atrial Fibrillation.
- Multimodal imaging with Computed tomography was performed which demonstrated a large region of ischemic penumbra within the left Middle Cerebral Artery(MCA) distribution.

- Occlusion of the left M1 segment with collaterals to a limited number of opercular, insular, and cortical branches was noted.
- Mechanical embolectomy was performed to revascularize the left MCA and after the procedure she was AAO x 4, able to move all extremities, and her facial droop had resolved.
- NIHSS improved to 0.



Final Angiogram



The final angiographic run had revealed the development of a new CC Fistula secondary to rupture of a cavernous segment aneurysm after extraction of the stentriever (Fig 3), as there was no early venous filling seen during or subsequent to deployment of the device.

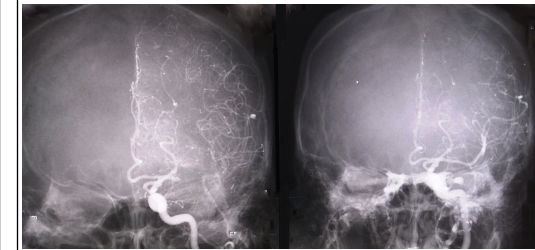
Neurovascular Technique

The patient was placed on the angiographic table in the supine position. Intraarterial infusion of non-thrombolytic nitroglycerin was initiated to ameliorate vasospasm and maintained for the duration of the intervention.

An ACE64 - Penumbra aspiration catheter was connected to continuous heparinized saline flush and advanced into the distal ICA over a Marksman microcatheter which was then advanced through the left MCA occlusion over a Synchro-14 microwire.

After an angiographic run to demonstrate appropriate positioning, a 6mm x 25mm Stent Retriever was deployed and after allowing for several minutes of reperfusion, the device was extracted under Penumbra aspiration removing a solid occlusive mass. Prior to deployment and subsequent to removal of the Stentriever, a final angiographic run confirmed TICI 3 flow.

Iatrogenic CC Fistula



Unsubtracted AP image demonstrating prethrombectomy left M1 occlusion and post thrombectomy M1 revascularization now with the iatrogenic CC Fistula

Conclusions

Careful Endovascular navigation and device deployment of the retriever under full inspection of the roadmap may prevent or reduce the incidence of direct CCFs; however, sometimes it may become necessary to choose the potential complication to save a patient's life as was the case described in this report.

Learning Objectives

Iatrogenic direct CCFs secondary to vessel injury during endovascular rescue may be able to be observed rather than treated emergently unless they are associated with cortical venous reflux or hemodynamic compromise. Careful visualization of the underlying cavernous carotid artery and cautious navigation and device deployment under a high quality fluoroscopic roadmap may reduce the incidence of direct CCFs secondary to devices like stentriever, however, ultimately the risk of proceeding must be weighed against the potential benefit.

References 1.Korkmazer B, Kocak B. Endovascular treatment of carotid cavernous sinus fistula: A systematic review. *WJR* 2013;5(4)143-155.