

# Direct Carotid Cavernous Fistula Following Mechanical Thrombectomy- Rare But Potential

## Complication : A Case Report

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### Introduction

Direct carotid cavernous fistula (DCCF) occurs mostly due to trauma or aneurysmal rupture. Iatrogenic DCCF formation after endovascular thrombectomy is very rare.

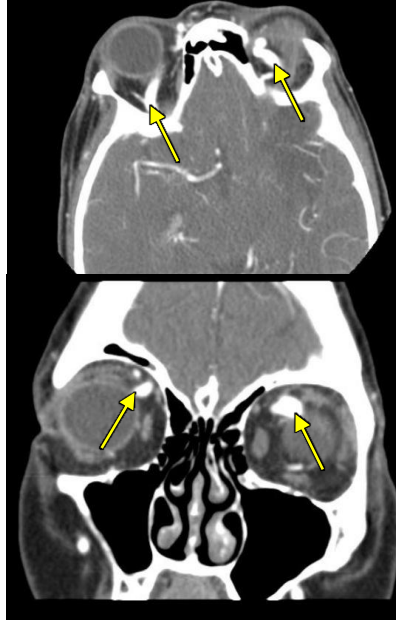
### Case presentation

A 61 year old right handed Caucasian lady with history of recent embolic stroke (one and a half months ago) status post left middle cerebral artery and terminal internal carotid artery mechanical thrombectomy, paroxysmal atrial fibrillation presented with redness, swelling and watering of both eyes for ten days, without improvement with topical antibiotics. This was accompanied by visual blurriness, pressure like sensation, and swelling of both eyes. There was no history of itching, pain, fever, upper respiratory tract infection symptoms.

Eye examination showed bilateral conjunctival erythema, chemosis and proptosis of left eye. Light reflex, accommodation reflex, extra-ocular movements, visual fields were preserved bilaterally. Visual acuity was 20/30 in left and 20/50 in right eye. Fundoscopy showed dilated retinal veins. Intra-ocular pressure was high normal (20 mm Hg). Neurological examination showed right sided hemiparesis with right facial nerve palsy. Deep tendon reflexes were 2/4 on the left side and brisk on the right side.

Preliminary investigations showed normal complete blood count and basic metabolic panel, TSH - 0.197 and fT4 - 1.04. CT scan of the orbits showed dilated superior ophthalmic veins (left greater than right) with prominent vascularity at the level of cavernous sinuses. This raised a suspicion of carotid cavernous fistula (CCF).

★ CT orbits with contrast showing dilated superior ophthalmic veins, Left>Right (yellow arrows)



An intraoperative cerebral angiogram was done which showed a DCCF extending from the posterior aspect of the left cavernous internal carotid artery into a dilated left cavernous sinus. Varix formation was noted between the cortical venous system and cavernous sinuses.

The fistula was then completely embolized and the left anterior and middle cerebral artery filling through the anterior communicating artery was confirmed. There were no post-procedural complications. A ten week follow up MR angiogram confirmed occlusion of the fistula.

### Discussion

Development of CCF after mechanical thrombectomy for large vessel stroke is rare and its exact incidence has not been reported yet to the best of our knowledge. One study showed an incidence of 0.8% of direct carotid cavernous fistulas after common neurosurgical interventions. There has been few case reports of intra-procedural and early post-procedural fistulas (after 2-3 weeks). However, presentation after one and a half month of the procedure has not been reported yet. Stent retrievers deployed during mechanical thrombectomy and its subsequent withdrawal can cause vessel injury like stretching of arteries and accompanying veins, avulsion of branched vessels. These have been the proposed mechanisms for development of DCCF.

### Conclusion

Recognition and awareness of the clinical presentation of a high flow CCF is important as prompt intervention is required to prevent permanent visual loss and decrease mortality due to intracerebral hemorrhages and infarcts.