Carotid Artery Stenting After Reconstruction with PTFE Graft

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Disclosure

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Carotid blow-out, also known as rupture of the carotid artery, is a feared complication during head-and-neck surgery, presenting in 3-4% of head-and-neck cancer patients.

Presenting mainly in patients with head-and-neck cancers, radiation-induced necrosis, recurrent tumors, or pharyngocutaneous fistulas.

Most cases occur proximal to the carotid artery bifurcation and 2% are bilateral.

Reported neurologic morbidity and mortality rates associated with carotid blow-out are 40% and 60%, respectively.
Introduction

- Treatment involves immediate hemostasis by reconstruction of the damaged artery and follow-up to assess complications (carotid occlusion or neck mobility impairment).
- Some of the complications of carotid artery reconstruction are:
  - Stroke
  - Thrombosis
  - Stenosis
  - Brain abscess formation
  - Rebleeding
- If stenosis is present, stent-grafts could be considered.
We present the case of a 54 year-old female patient with a 6-year history of systemic arterial hypertension controlled with medication and a recent diagnosis of thyroid cancer. The patient presented to the hospital for a surgical resection of the tumor. During the procedure, the right common carotid artery (CCA) ruptured and an intraoperative carotid reconstruction was made by the cerebrovascular surgeon.
Treatment

- Intraoperative reconstruction of the right CCA was made using a polytetrafluoroethylene (PTFE) graft.
- The postoperative angiography showed stenosis of approximately 60% at the proximal bifurcation and a 30% non-significant diameter reduction at the distal bifurcation of the graft.
- Previously anti-aggregated with acetylsalicylic acid and clopidogrel, a carotid angioplasty was made using a 7x35 mm double layer micromesh stent to assess stenosis.
- A 2-year follow-up angiography showed no further complications or changes in diameter.
Results

**Image A.** Right carotid post-op AP angiography showing the vascular graft and stenosis (60%) of the right CCA proximal bifurcation.

**Image B.** Right carotid AP angiography showing carotid stenting with carotid angioplasty, late filing of the CCA is observed but considered safe due to the double layer micromesh stent.
Results

Image C. 2 year follow-up MRI (T1)
Discussion

- Surgical resection is the choice of treatment for locally advanced thyroid cancer and the risk of carotid artery rupture is a feared complication. If present, 60% of patients will develop a life-threatening hemorrhage requiring emergent neurosurgical intervention.

- Emergency ligation of the carotid artery causes neurological complications in 30% of patients, according to literature. In this patient, stenosis of the carotid artery was seen in postoperative angiography.

- Although, stent placement has showed a higher risk of recurrent carotid blow-out, this case showed promising findings and no further complications after metal double layer micromesh stent was placed to correct stenosis.
Summary Points

● Surgical reconstruction of the artery was an emergency measure following the sudden rupture of the right CCA.

● The use of a metal double layer micromesh stent to assess stenosis following a PTFE graft reconstruction of the right CCA shows promising findings after a 2-year follow-up.

● This procedure could be an option for selected cases.

● Further investigation is needed to ensure its safety.