

# Covered Stents to Manage Difficult Carotid Artery Lesions: Techniques, Indications, and Pitfalls

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The occurrence of carotid arterial injuries is relatively infrequent but may result in serious neurologic deficits. Surgical treatment is associated with a high morbidity and mortality rate. Endovascular treatment using stent grafts to exclude pseudoaneurysms (PAs) and arteriovenous fistulas (AVFs) while preserving flow is an attractive option.

## **Purpose**

The purpose of this study was to report the safety and efficacy of stent graft placement for management of traumatic AVFs and PAs involving the carotid arteries.

## **Material and Methods**

Twenty patients (men, 16; women, 4) with carotid artery AVFs and PAs were treated with percutaneous placement of stent grafts. Vascular injuries were caused by gunshot wound (7 patients), post carotid endarterectomy (4 patients), blunt trauma (2 patients), neck tumor invasion (2 patients), spontaneous carotid dissection (2 patients), stab wound (2 patients), and central venous line access (1 patient). Clinical presentation included neck tumor (6 patients), bruit (5 patients), headaches (4 patients), active bleeding through the oral cavity and tracheotomy (2 patients), transitory hemiparesis (2 patients), seizure (1 patient), and stroke (1 patient). Diagnoses were made by computed tomography (CT) angiogram and angiography. Lesion locations were: common carotid artery (13 patients) and internal carotid artery (7 patients). PAs developed in 15 patients and AVFs in 5 patients. Arterial access was via percutaneous femoral approach (19 patients) and surgical common carotid approach (1 patient). Stent grafts included Wallgraft (6 patients), Corvita endovascular graft (5 patients), Viabahn (4 patients), Jomed stent graft (3 patients), and autologous vein covered Palmaz stents (2 patients). Follow-up ranged from 2 months to 12 years and included clinical examination, CT angiography, Doppler ultrasonography, and angiography.

## **Results**

Resolution of PAs and AVFs was achieved in all patients. In one patient with a petrous giant false aneurysm an acute occlusion of the carotid artery was seen after placement of three balloon expandable stent grafts without neurologic complications owing to a functional circle of Willis. Doppler follow-up and angiography showed an asymptomatic 90% stenosis owing to stent compression after 13 months in a patient with an autologous vein-covered stent placed in the internal carotid artery. Three patients died for causes unrelated to stent graft placement: cancer (2 patients) and brain surgery (1 patient).

## **Conclusions**

Our results support the use of stent graft instead of surgery for patients with carotid injuries.