

Stenting and Angioplasty of the Protected Carotid Artery

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Short Communication

Carotid artery stenting (CAS) is an endovascular surgery that involves placing a stent into the carotid artery lumen to cure stenosis and reduce the risk of stroke. When carotid endarterectomy is deemed too dangerous, CAS is used to address stenosis of the carotid artery in high-risk patients.

Uses

Carotid stenting is a procedure that reduces the risk of stroke caused by stenosis of the carotid artery. Carotid stenosis can cause symptoms such as transient ischemic episodes (TIAs) or strokes, or it can cause no symptoms at all.

While endarterectomy has traditionally been the treatment for carotid stenosis, stenting offers an alternative for people who are not surgical candidates. Medical comorbidities (severe heart disease, heart failure, severe lung disease) and anatomic features (contralateral carotid occlusion, radiation therapy to the neck, prior ipsilateral carotid artery surgery, intra-thoracic or intracranial carotid disease) are high risk factors for endarterectomy, which would favour stenting instead [1].

Reasons to stay away

While both surgery and stenting have low rates of stroke and mortality, stenting may have a greater rate of stroke and death than endarterectomy, especially in individuals over the age of 70 [2].

Procedure

The implantation of a stent across the stenosis in the carotid artery is known as carotid stenting. It can be done with either general anaesthetic or local anaesthetic.


The stent can be inserted into the femoral artery or the common carotid artery in the neck. Vascular access, bridging the stenosis with a wire, installing a stent across the lesion, and removing the vascular access are all important processes in both techniques. Other procedures, such as the use of a cerebral protective device, pre- or post-stent balloon angioplasty, and cerebral angiography, may or may not be undertaken.

Stenting of the carotid arteries in the femur

The trans-femoral technique to carotid stenting is the most common. The common femoral artery is punctured to provide

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access to the arterial system in this method. The wire and sheath are pushed via the aorta to the common carotid artery on the treated side. It is possible to apply flow reversal or filter cerebral protection. The treatment is usually done through the skin.

Revascularization of the trans carotid artery (TCAR)

A surgical incision is made at the base of the neck over the common carotid artery for trans-carotid artery stenting. At that point, wire access is gained and used to deliver the stent to the internal carotid artery. During the most dangerous parts of the procedure, flow reversal is used to protect the brain: the common carotid artery is pinched, and arterial blood from the internal carotid is routed through a filter and returned to a femoral vein.

Angioplasty

Angioplasty, also known as balloon angioplasty or percutaneous transluminal angioplasty (PTA), is a minimally invasive endovascular technique for widening restricted or obstructed arteries or veins, which is primarily used to treat arterial atherosclerosis [1]. A deflated balloon attached to a catheter (a balloon catheter) is inserted into the constricted conduit over a guidewire and then inflated to a predetermined size [3]. The balloon causes the blood vessel and surrounding muscle wall to expand, allowing for better blood flow. A stent may be put during ballooning to keep the vessel open, after which the balloon is deflated and removed [4]. Angioplasty has come to refer to a wide range of vascular procedures that are usually done through the skin.

Indications and uses

Coronary angioplasty

A coronary angioplasty is a treatment for stenotic (narrowed) coronary arteries in the heart, which are present in people with coronary heart disease. The accumulation of cholesterol-laden plaques in a condition known as atherosclerosis causes these stenotic portions of the coronary arteries to form [5]. PCI, also known as coronary angioplasty with stenting, is a non-surgical technique that improves blood flow to the heart.

Coronary angioplasty is used to treat conditions like unstable angina, NSTEMI, STEMI, and spontaneous coronary artery perforation [1]. PCI has been demonstrated to considerably reduce symptoms such as angina, or chest discomfort, consequently improving functional limitations and quality of life in patients with stable coronary disease [6].

Peripheral angioplasty

The use of a balloon to open a blood artery outside of the coronary

arteries is known as peripheral angioplasty. It is most typically used to treat peripheral artery disease-related atherosclerotic narrowings of the belly, leg, and renal arteries. A guide wire, peripheral stenting, and an atherectomy are frequently utilised in combination with peripheral angioplasty [7].

Chronic limb-threatening ischemia

Advanced peripheral artery disease can be treated by angioplasty to relieve the claudication, or leg pain, that is commonly associated with the condition [8].

In the bypass versus angioplasty in severe ischemia of the leg (BASIL) trial, patients with severe lower limb ischemia who were suitable for either technique had infrainguinal bypass surgery first compared to angioplasty first. The BASIL trial discovered that angioplasty was associated with less short-term morbidity than bypass surgery, but that bypass surgery has better long-term results [9].

References

- 1 Gurm HS, Yadav JS, Fayad P, Katzen BT, Mishkel GJ, et al. (2008). "Long-term results of carotid stenting versus endarterectomy in high-risk patients". *N Engl J Med*. 358:1572–1579.
- 2 Bonati LH, Lyrer P, Ederle J, Featherstone R, Brown MM (2012). "Percutaneous transluminal balloon angioplasty and stenting for carotid artery stenosis". *The Cochrane Database of Systematic Reviews*.
- 3 Chhabra L, Zain MA, Siddiqui WJ (2018). *Coronary Stents*.
- 4 Marmagkiolis K, Iliescu C, Edupuganti MM, Saad M, Boudoulas KD, et al. (2019). Primary patency with stenting versus balloon angioplasty for arteriovenous graft failure: A systematic review and meta-analysis. *J Invasive Cardiol*. 31:E356-3561.
- 5 "Atherosclerosis". *NHLBI*.
- 6 Arnold, Suzanne V. (2018). "Current Indications for Stenting: Symptoms or Survival CME". *Methodist DeBakey. Cardiovasc J*. 14: 7–13.
- 7 Abdullah O, Omran J, Enezate T, Mahmud E, Shammash N, et al. (2018). Percutaneous angioplasty versus atherectomy for treatment of symptomatic infra-popliteal arterial disease. *Cardiovasc Revasc Med*. 19:423-428.
- 8 Topfer LA, Spry C. (2018). New technologies for the treatment of peripheral artery disease. *CADTH Issues in Emerging Health Technologies*.
- 9 Adam DJ, Beard JD, Cleveland TA, Bell J, Bradbury AW, et al. (2005). Bypass versus angioplasty in severe ischaemia of the leg (BASIL): multicentre, randomised controlled trial. *Lancet (London, England)*. 366:1925-1934.