

Intracranial Cerebral Arterial Stenosis in Stroke

Role of carotid and other cerebral arterial stenosis in stroke ?

Stroke is the third most common cause of death and disability. According to WHO Survey in 1990, out of 9.4 million deaths in India 6,19,000 were due to stroke. Most of the strokes (approximately 75%) are ischaemic in nature and large vessel disease accounts for approximately 40% of ischaemic strokes. It has been estimated that approximately 20-30% of strokes may be caused by stenosis of carotid artery. Although in western world extracranial (mostly the origin of ICA) is the most commonly involved site of narrowing in Asian populations intracranial atherosclerosis is quite common. Trials have showed that symptomatic and severe intracranial narrowing have a high incidence of stroke on medical treatment.

What are the various means to diagnose carotid artery stenosis?

- **Carotid Doppler** is a non-invasive & accurate modality to assess carotid stenosis. However, Doppler cannot assess intracranial vessels or origin of vertebral arteries.
- **MR Angiography (MRA)/CT Angiography (CTA)** offers excellent quality imaging of carotid artery as well as of intracranial major vessels non-invasively.
- **Digital Subtraction Angiography (DSA)** is the “gold standard”, however it is an invasive investigation and is usually reserved to evaluate stenosis detected in non-invasive investigations as well when the non-invasive investigations are non-conclusive.

What are the treatments for cerebral arterial stenosis ?

Medical treatment is done for the risk factors for atherosclerosis such as hypertension, diabetes mellitus & dyslipidemia. Patients are also told to stop smoking. Anti-platelet drugs (aspirin, clopidogrel) are useful to prevent embolic events. Patients with marked stenosis require revascularization which can be achieved by surgical (endarterectomy) or endovascular (angioplasty & stenting) means. Surgical revascularization is not possible in intracranial arteries and angioplasty/stenting are the options available for recanalization.

What are the indications for carotid revascularization (stenting/ endarterectomy)?

Symptomatic carotid stenosis

More than 70% of carotid stenosis is revascularized; with 50%–69% carotid stenosis revascularization is recommended for patients who have had recent transient ischaemic attack or stroke depending upon patient-specific factors such as age, gender, co-morbidities and severity of initial symptoms.

Treatment of asymptomatic carotid stenosis is more controversial. Guidelines indicate that patients benefit from treatment if the operator has a low complication rate

Vertebral artery origin stenosis should be treated when it involves dominant vertebral artery or has recurrence despite medical therapy.

In case of intracranial arteries patients who have significant narrowing and have recurrent symptoms despite medical therapy are the candidates for angioplasty/stenting.

What is a protection device and what is its role in carotid stenting?

Filter protection devices are umbrella-shaped devices that are placed temporarily in the internal carotid artery beyond the site of stenosis during the procedure. These devices have small pores designed to exclude particulate debris embolization to cranial circulation during the procedure.

Can stenosis of other cranial arteries such as vertebral and intracranial arteries be treated?

Many cases of stroke occur due to stenosis in vertebral & intracranial atherosclerotic diseases. Recent studies have shown that these patients with intracranial stenosis have high risk of stroke in spite of medical treatment. Recent advances in technology have made angioplasty and stenting possible in these patients.