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Neuroimaging Highlight

Primary Carotid Stenting

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A 66-year-old male presented with right hemispheric transient ischemic attacks. Computed tomography angiography (CTA) demonstrated a very severe atherosclerotic stenosis of the proximal right internal carotid artery, > 95% by NASCET criteria. Carotid stenting was performed using a self-expanding stent (SES) alone, without balloon angioplasty or embolic protection. An immediate anteroposterior (AP) x-ray of the neck (Figure 1) shows the stent in place. A carotid Doppler done the same day demonstrated a peak systolic velocity (PSV) of 142 cm/sec and an internal carotid to common carotid artery (ICA/CCA) velocity ratio of 1.8, corresponding to a stenosis of approximately 50%. Six weeks later, the stent had gently expanded by itself (Figure 2). The Doppler showed a PSV of 91 cm/sec and an ICA/CCA ratio of 0.87, indicating no residual stenosis. The patient remains asymptomatic.

In the major randomized controlled trials (RCTs) comparing carotid endarterectomy to carotid angioplasty and stenting (CAS), the endovascular procedure is performed using pre-and

Figure 1: *AP neck X-ray immediately post-stenting.*

Figure 2: *AP neck X-ray 6 weeks post- stenting.*

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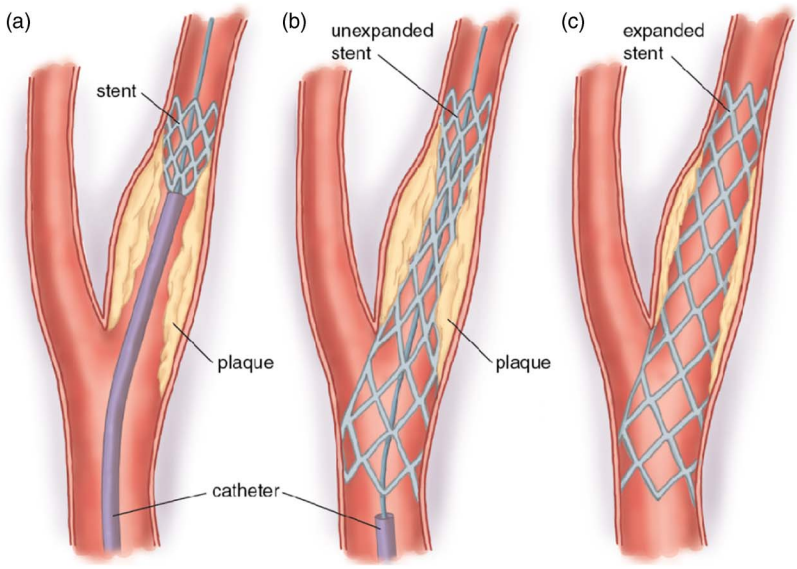

Figure 3: *Primary Carotid Stenting. A self-expanding stent alone is used to gently open the internal carotid artery, usually over 4-6 weeks No balloon angioplasty or embolic protection device is used.*

post-stenting balloon angioplasty and embolic protection devices (EPDs).[1,2] Balloon angioplasty is one of the most embologenic stages of CAS, and may result in significant hemodynamic instability.[3,4] Embolic protection devices are expensive, do not catch all emboli and are themselves associated with unique complications.[5] In selected patients, particularly those with little calcification of carotid plaque on CTA source images,[6] use of balloon angioplasty and EPDs can be avoided. A SES may be all that is required for a successful outcome.[7,8] This less invasive approach, termed primary carotid stenting (Figure 3) has not yet undergone RCT validation but it is faster, cheaper and potentially safer than standard techniques.[9,10]

As Occam's Razor tells us: "It is vain to do with more what can be done with less."

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