Delayed occlusion following carotid artery stent placement

Case illustration

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This 59-year-old nonsmoking man with hypertension and hyperlipidemia presented with a history of recurrent left-sided hemiparesis. Carotid artery (CA) angiography performed on admission revealed 99% stenosis of the right internal carotid artery (ICA); Fig. 1 upper left). Because the patient preferred CA stent placement for the treatment of the stenosis, that procedure was performed. Dilation before stent delivery was achieved with a low-profile 3.5 × 20-mm balloon catheter inflated to 6 atm, followed by placement of a 15-mm PALMAZ stent (Cordis, Johnson & Johnson Co., Warren, NJ) remounted with a 7 × 20-mm balloon catheter. After inserting the stent, complete dilation of the right ICA was evident (Fig. 1 upper right). The procedure was performed uneventfully and was well tolerated by the patient. Antiplatelet therapy with aspirin (100 mg/day) was continued after the procedure. Follow-up angiography was performed 6 months postprocedure and annually thereafter, with no significant restenosis occurring at 6, 12, and 24 months after surgery (Fig. 1 lower left). Right CA angiography performed 36 months following stent placement, however, revealed complete occlusion of the right ICA at its origin just proximal to the stent, without deformation of the device (Fig. 1 lower right). No new ischemic lesion was demonstrated on intracranial magnetic resonance imaging. Furthermore, this occlusion occurred in the absence of ischemic episodes following stent placement, while medical control of hypertension and hyperlipidemia was good.

Carotid artery stent placement is considered to be a less invasive procedure than carotid endarterectomy (CEA) for the treatment of stenosis and may provide an alternative to CEA, especially in patients deemed to be at higher risk for endarterectomy.1 Stent placement has an equivalent effect on stroke prevention compared with CEA; however, it is associated with a higher possibility of restenosis than CEA. Restenosis typically occurs within 12 months after placement of a stent2–5 and is reported to be due to myointimal hyperplasia. In studies of coronary artery stent placement, a decrease in luminal diameter caused by myointimal hyperplasia has been observed within 6 months after stent placement (so-called “negative remodeling”), and late improvement in luminal diameter appears to occur between 6 months and 3 years (termed “positive remodeling”).2 For the reasons stated earlier, the reported case is extremely rare given that the lesion, which had been stable for 2 years after stent placement, became asymptptomatically occluded at 3 years postprocedure. We propose the following mechanisms for delayed occlusion following CA stent placement: 1) in-stent restenosis progressing between the 2nd and 3rd years; and 2) atherosclerotic changes at other areas of the right ICA progressing to complete occlusion. The precise mechanisms remain unclear, however. This case demonstrates that long-term follow up with angiography or other diagnostic modalities is indispensable following CA stent placement.

References


Fig. 1. A series of right common CA angiograms. Upper Left: Angiogram obtained prior to stent placement, demonstrating 99% stenosis (arrow) of the ICA. Upper Right: Angiogram obtained immediately after stent placement, demonstrating complete dilation of the right ICA. Lower Left: Follow-up angiogram obtained 24 months after stent placement, demonstrating no significant restenosis. Lower Right: Follow-up angiogram obtained 36 months after stent placement, demonstrating complete occlusion (arrow) of the right ICA at its origin just proximal to the stent, without deformation of the device.