

## Horner's Syndrome Following Internal Carotid Artery Stent Placement

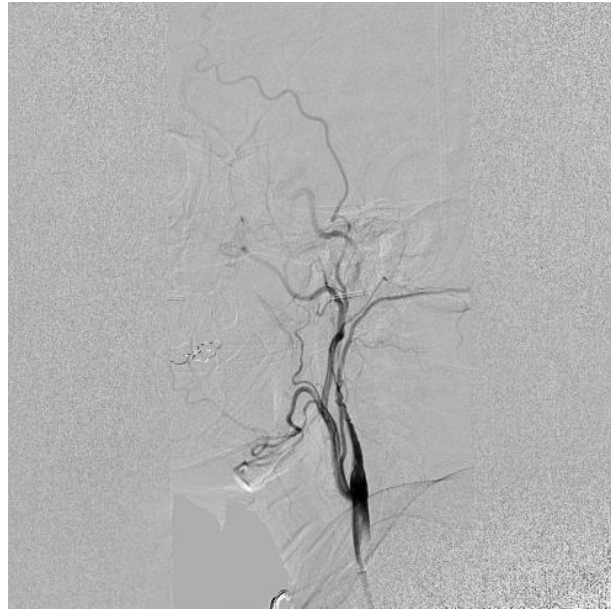
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We describe the occurrence of Horner's syndrome in a patient who underwent stent placement in internal carotid artery and the lesion location of interruption of sympathetic fibers secondary to arterial dilation.<sup>1</sup>

### Case description

A 38-year-old woman presented with acute right hemiplegia and aphasia and initial National Institutes of Health Stroke Scale Score of 18. The patient had past history of Arnold Chiari type I malformation, Attention Deficit Hyperactivity Disorder, fibromyalgia, migraines, and scoliosis. Due to clinical diffusion mismatch on MRI patient underwent an emergent cerebral angiogram which demonstrated left internal carotid artery occlusion secondary to dissection involving the high cervical region and origin of petrous segment. The diagnosis of dissection was made according to the ZQSRC criteria<sup>2</sup>. The dissection was treated using an 8 x 40 mm Express (Boston Scientific, Natick, MA) and an 8x20 mm Express self-expanding stents. Post procedure there was successful restoration of the lumen of the left internal carotid artery without evidence of residual stenosis or dissection. The patients demonstrated improvement in aphasia and right hemiplegia in the immediate post procedure period. After 3.5 hours, the patient developed miosis and ptosis of left eye which worsened within the next 2 hours. To differentiate between pre- and post-ganglionic sympathetic lesion, we determined the response to 2 drops of topical phenylephrine 1% in the conjunctival sacs of both eyes of the patient. We photographed the pupils in affected and non-affected side with a metric scale at baseline, 2 and 5 minutes post instillation. These images were exported into Analyze Direct 9.0 software (AnalyzeDirect, Inc., Overland Park, KS) and the pupillary diameter was measured. These measurements were then calibrated with the metric ruler within the picture to provide absolute measurements. The affected eye demonstrated an increase of 0.1mm at 5 min. The normal eye demonstrated an increase of



0.2mm at 5 min in pupillary diameter. Given the minimal increase in diameter of affected pupil to phenylephrine drops, the lesion was identified as pre-ganglion in origin.

### Discussion

Horner syndrome is associated with carotid artery dissection, and has also been reported in after carotid artery stent placement.<sup>1</sup> Our results suggest that the preganglionic neurons of the cervical sympathetic plexus can be interrupted with stent associated arterial distension. These fibers originate from the intermediolateral cell column of the C8 to T2 levels of the spinal cord and travel cephalad to synapse in the superior cervical ganglion near the angle of the mandible. The postganglionic neurons ascend to the cranium as part of the internal carotid plexus and supply the dilator muscles of the iris. The pre-ganglionic location is the most common site of

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Horner syndrome secondary to surgical procedures including coronary artery bypass surgery, lung or mediastinal surgery, carotid endarterectomy, insertion of a pacemaker, epidural anesthesia, interpleural placement of chest tubes, and internal jugular catheterization.<sup>3</sup>

Recently, phenylephrine eye drops have become a first-line pharmacological agent for identification of location of lesion in Horner's syndrome due increased availability compared with cocaine, hydroxyamphetamine, and adrenaline drops.<sup>4</sup> Although initially used 10% phenylephrine solution, more recent studies<sup>5</sup> have used 1% solution of phenylephrine for testing denervation supersensitivity of the iris dilator muscle. A lesion interrupting the postganglionic fibers should dilate the pupil when phenylephrine is placed in the conjunctiva. The pupil of a patient with central Horner's syndrome should not

dilate, while pupil may dilate only minimally with pre-ganglionic lesion like in our patient.<sup>6</sup> A normal pupil may dilate only minimally.

Our study provides additional information regarding the location of cervical sympathetic fiber interruption in patients with post carotid stent Horner's syndrome.

## Figure Legend

Figure 1 describes Pre-stent (solid arrows) and post-stent (dashed arrows) appearance of Left internal carotid artery dissection on lateral angiographic view

## Acknowledgement

None

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