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Figure. After application of perspiration detection powder and placement in a hot room. Used with permission of Jason D. Heiner, MD, Department of Emergency Medicine, Madigan Army Medical Center, Tacoma, WA.

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A 29-year-old woman presented to the emergency department, complaining of slightly blurry vision. She also observed that after exercise, her face seemed to sweat unevenly. A white perspiration detection powder was applied to her face, which changes color from white to deep purple in the presence of moisture by an iodinated starch reaction. The staining pattern shown was revealed after she was placed in a hot room for several minutes (Figure).

For the diagnosis and teaching points, see page 726.

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DIAGNOSIS:

Horner's syndrome. The classic triad composing Horner's syndrome is ptosis, miosis, and anhidrosis from a lesion along the ipsilateral oculosympathetic pathway. Carotid artery dissection, Pancoast tumor, pneumothorax, neck trauma, brainstem injury, and iatrogenic causes have all been described.^{1,2} Its significance becomes apparent with an understanding of the oculosympathetic pathway 3-neuron chain.¹ The first-order nerve fibers descend from the hypothalamus without decussation to the thoracic spinal cord before synapsing with the second-order neurons. These neurons exit the spine at the C8, T1, and T2 levels to enter the sympathetic chain and travel over the pleural cap of the lung and loop around the subclavian artery before synapsing near the carotid bifurcation.² Final third-order neurons travel along the internal carotid artery to innervate the eyelids and the eye and also along the external carotid artery to innervate facial sweat glands.

Horner's syndrome is often subtle. The ptosis results from lack of sympathetic innervation to the upper and lower eyelids (sparing the levator palpebrae). The anisocoria caused by paralysis of the muscles that dilate the iris is most easily appreciated in dim light, in which the miotic pupil will be slower to dilate. An ophthalmic cocaine solution will not dilate the miotic pupil. Impaired facial sweating may be better observed after application of a perspiration detection powder, but simple asymmetric facial flushing can often be appreciated.¹ Once the syndrome is identified, a careful history and physical examination will guide subsequent testing to determine the underlying cause of a Horner's syndrome.

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