Automated documentation, using Volk Eye Check, of acquired Horner's syndrome following surgical anterior cervical decompression

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Introduction

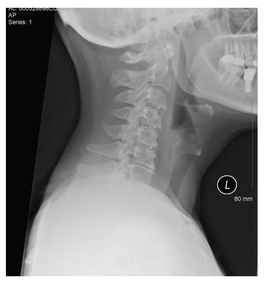
Horner's syndrome is caused by a total or partial interruption of the sympathetic chain anywhere along its course from the hypothalamus to the eye. The clinical signs of Horner syndrome include ptosis and miosis. Although a possible cause of acquired Horner's syndrome is surgery, sympathetic injury is not a common sequence of cervical operations (Saylam et al, 2009). Allen & Meyer (2009) reviewed a series of 6 cases of oculosympathethetic paresis that resulted from interventional procedures in the neck.

The Volk Eye Check is a hand-held medical camera device that captures analyses and displays, in real time, eye measurement data including pupil size and margin reflex distance (MRD).

Figure 1: MRIs and x-ray showing pre-op and post op appearance of spinal cord compression

(a) Pre-op MRI

(b) Post-op MRI



(c) Post-op X-ray

Conclusions

Surgery to the cervical region of the spine is a potential cause of Horner's syndrome (Allen & Meyer, 2009). Measurement of MRD and pupil sizes before and after surgery using automated photo-documentation should be considered. The Volk Eye Check detects subtle differences in MRD and pupil sizes between the eyes and shows the potential to be a powerful diagnostic assistant tool for the eye care practitioner.

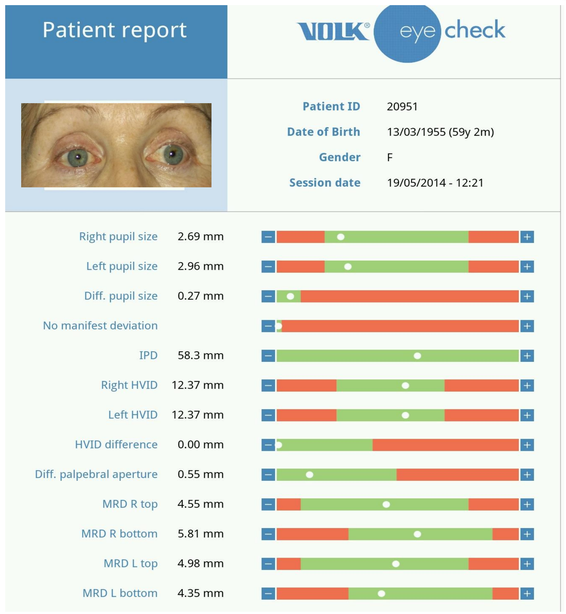


Figure 2: Anisocoria photographed in light index 85 (increased ambient lighting) Volk Eye Check Report.

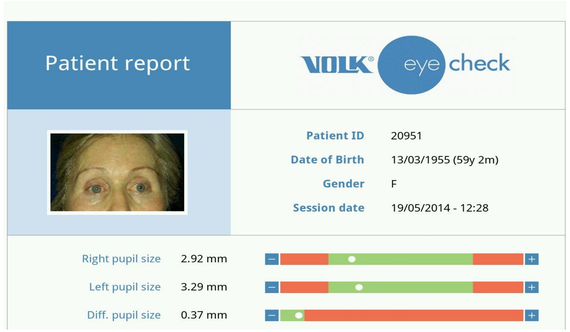


Figure 3: Anisocoria photographed in light index 61 (lower ambient lighting) Volk Eye Check Report.

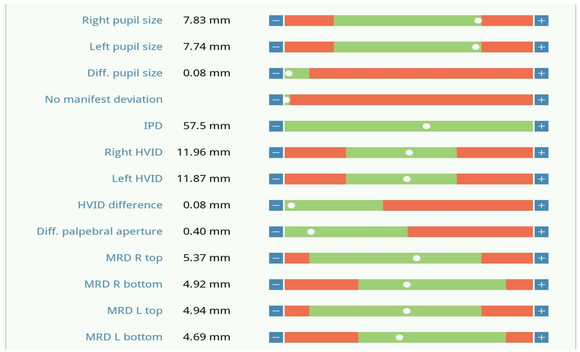


Figure 4: Volk Eye Check Report following dilation with phenylephrine 2.5%

Case History

The patient was a 61-year-old female under the care of her Consultant Spinal Neurosurgeon[3] with a long history of neck pain. An MRI scan in 2007 showed a significant C4/5 disc bulge and a more modest bulges C5/6 and C3/4 . Her symptoms gradually worsened over the next few years. In 2014 the MRI was repeated which showed progression of the degenerative changes and worsening of her spinal cord compression. The indication for surgery was protection of the spinal cord. She underwent C3/4, C4/5 and C5/6 anterior cervical discectomies and fusion using Brantigan carbon fibre cages without a plate in May 2014. The surgery was uneventful. Post operatively there were no surgical issues apart from the right sided Horner's syndrome. Figure 1. shows pre- and post operative scans.

Two weeks after surgery she presented to her optometrist[1] concerned about the appearance of her right eye. A ptosis of the right superior eye lid was noted together with anisocoria. The external eye features were documented with the Volk Eye Check in two differing ambient light levels with the size of the anisocoria increasing from 0.27mm (Figure 2) to 0.37mm in lower ambient light (Figure 3). The difference in palpebral aperture (MRD 1 & 2) is also shown in Figure 2.

Volk Eye Check measurements were repeated nine days later when the patient returned reporting symptoms that mandated a mydriatic retinal exam. Pre-dilation measurements showed no change in ptosis or anisocoria. Measurements of pupil size under mydriasis with phenylephrine 2.5% and tropicamide 0.5% are shown in Figure 4. Note no significant anisocoria and the increased MRD1 right eye due to secondary sympathetic hypersensitivity.

References

1. Saylam CY, Ogiray E, Orhan M, Cagli S, Zileli M (2009) Neuroanatomy of cervical sympathetic trunk: a cadaveric study. Clin Anat. 22(3): 324-330

2 Allen AY & Meyer DR (2009) Neck procedures resulting in Horner syndrome, Ophthal Plast Reconstruct Surg. Jan-Feb;25(1):16-18

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