

Vertical diplopia

Both central (eg, brain stem, cerebellum) and peripheral (eg, vestibular, fourth cranial nerve palsy) etiologies can cause a vertical misalignment between the eyes with a resultant vertical diplopia. A vertical binocular misalignment may be due to a skew deviation, which is a nonparalytic vertical ocular misalignment due to roll plane imbalance in the graviceptive pathways. A skew deviation may be 1 component of the ocular tilt reaction.

The presence of a skew deviation usually indicates a brain stem or cerebellar localization. Vertical ocular misalignment is easily missed when observing the resting eye position alone.

Physical therapists treating patients with vestibular pathology from central or peripheral causes should screen for vertical binocular disorders ¹⁾.

[Trochlear nerve](#) palsy is the most common cause for vertical extraocular muscle weakness and vertical diplopia. However, other causes of an apparent superior oblique palsy such as [myasthenia gravis](#) and thyroid eye disease should be excluded before it can be attributed to a trochlear nerve lesion.

The diagnosis of an acquired vertical [strabismus](#) is not always straightforward. There is no one specific test that will diagnose a vertical deviation. The clinical presentation, signs, and symptoms are the driving forces that will help lead to the correct diagnosis. Patients with binocular vertical [diplopia](#) may have symptoms of recent onset or that have been long-standing. Others may not even be completely aware that their ocular symptoms are attributable to a doubled vertical image. The differential diagnosis for vertical diplopia includes [oculomotor nerve palsy](#), [superior oblique palsy](#), restrictive ophthalmopathies, [myasthenia gravis](#), and skew deviation. This differential diagnosis is best used to sort out signs and symptoms in a patient with a vertical misalignment and diplopia. Because most clinicians feel more comfortable addressing the patient with complaints of horizontal diplopia, the paper of Acierno will discuss the causes of vertical diplopia so that recognition will be easier, thus leading to more accurate diagnoses ²⁾.

After pterional craniotomy, ptosis, diplopia, and vertical gaze limitation can result from tethering of the superior rectus-levator palpebrae superioris complex to the surgical defect in the orbital roof. Lateral rectus function sometimes is compromised by muscle attachment to the lateral orbital osteotomy. This syndrome occurs in approximately 1% of patients after removal of the orbital roof and can be treated, if necessary, by prism glasses or surgery ³⁾.

¹⁾

Gold DR, Schubert MC. Ocular Misalignment in Dizzy Patients-Something's A-Skew. J Neurol Phys Ther. 2019 Apr;43 Suppl 2 Supplement, Special Supplement: International Conference on Vestibular Rehabilitation:S27-S30. doi: 10.1097/NPT.0000000000000271. PubMed PMID: 30883490.

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Acierno MD. Vertical diplopia. Semin Neurol. 2000;20(1):21-30. Review. PubMed PMID: 10874774.

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Desai SJ, Lawton MT, McDermott MW, Horton JC. Vertical diplopia and ptosis from removal of the orbital roof in pterional craniotomy. *Ophthalmology*. 2015 Mar;122(3):631-8. doi: 10.1016/j.optha.2014.09.011. PubMed PMID: 25439610; PubMed Central PMCID: PMC4339521.

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