

# Fourth Nerve (Superior Oblique) Palsy

## WHAT IS A FOURTH NERVE PALSY?

The fourth cranial nerve innervates the superior oblique muscle, so weakness of the nerve is also known as superior oblique palsy. Weakness of the superior oblique muscle causes misalignment of the eyes. Misalignment is most often vertical, but can also be horizontal and torsional. Palsy refers to a complete weakness of a muscle while a paresis is a partial weakness. This condition is usually unilateral (one eye) but can be bilateral (both eyes). In bilateral cases, it may asymmetrically affect one eye more than the other.

## WHAT ARE THE SYMPTOMS OF FOURTH NERVE OR SUPERIOR OBLIQUE PALSY?

Congenital superior oblique palsy, although present at birth, may have subtle symptoms that increase with age. Congenital superior oblique palsy may not be diagnosed until later in childhood or early adulthood depending on the severity. Congenital cases usually do not cause double vision in childhood, and a head tilt may be the only symptom.

A person may adapt an abnormal head position, usually tilting of the head to one side, which allows better alignment of the eyes and helps prevent double vision. The head tilt may get progressively worse with age. Examination of old photographs may reveal a chronic head tilt that one was not previously aware of. Facial asymmetry may result from a chronic head tilt.

Superior oblique palsy may cause double vision as a result of misalignment of the eyes (the brain perceives an image from two different directions). The double vision may be vertical (one image on top of the other), diagonal (vertically and horizontally separated) or torsional (rotated or twisted). The torsional phenomenon occurs more frequently with acquired cases of superior oblique palsy.

One eye may appear vertically off-centered compared to the other eye. This vertical misalignment may increase with time.

## WHAT CAUSES SUPERIOR OBLIQUE PALSY?



Superior oblique palsy can be congenital or acquired. Other congenital anomalies may be associated with superior oblique palsy (e.g. a misshaped skull – craniosynostosis). Isolated congenital superior oblique palsy does not typically require brain imaging. A common cause of acquired superior oblique palsy is head trauma, including relatively minor trauma. A concussion or whiplash injury from a motor vehicle accident may be sufficient enough to cause the problem. Rare causes of superior oblique palsy are stroke, tumor and aneurysm.

### HOW IS SUPERIOR OBLIQUE PALSY TREATED?

Congenital superior oblique palsy can progressively worsen over time and requires frequent eye exams. Ophthalmologists will monitor for amblyopia (lazy eye), loss of stereo (3D vision), and abnormal head posture. Some children will not need any treatment. If a child loses stereovision, has worsening head posture, or develops double vision, then strabismus surgery should be considered.

In cases of acquired superior oblique palsy it is important to identify and treat the underlying cause first. Once the cause of an acquired superior oblique palsy has been treated, the ophthalmologist will usually wait 6 months for possible spontaneous resolution of the palsy. During that period, double vision may be managed with prism glasses. Prisms merge two images into one but do not strengthen the eye muscles. If prisms are not effective, patching or covering one eye can alleviate the double vision. If the palsy does not recover over this 6-month period and if prisms are not able to adequately control the double vision, surgery may be indicated.

The treatment of choice for congenital superior oblique palsy and for an unresolved (after 6 months) acquired palsy is typically eye muscle surgery. Surgery usually minimizes double vision, reduces the upward drift of an eye, and corrects a compensatory head tilt. Surgery is performed on one or both eyes depending on the extent of the eye misalignment, the change of the misalignment in different directions of gaze, the amount of head tilt, and the amount of torsion.

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