

Hypertropia

The vertical miscoordination between the two eyes is called vertical strabismus and it may be hypertropia, whereby the visual axis of one eye is higher than the fellow fixating eye. Hypotropia is the similar condition, focus being on the eye with the visual axis lower than the fellow fixating eye.

Etiology

Hypertropia may be either congenital or acquired, The superior rectus, inferior rectus, superior oblique, and inferior oblique muscles affect the vertical movement of the eyes. These muscles may be either paretic, restrictive (fibrosis) or overactive effect of the muscles. Congenital cases may have developmental abnormality due to abnormal muscle structure, usually muscle atrophy / hypertrophy or rarely, absence of the muscle and incorrect placement. Specific & common causes include:

- Superior Oblique Palsy / Congenital fourth nerve palsy
- Inferior Oblique overaction
- Brown's Syndrome
- Duane's Retraction Syndrome
- Double elevator palsy
- Fibrosis of rectus muscle in Graves Disease (most commonly inferior rectus is involved)
- Surgical trauma to the vertical muscles (e.g. during scleral buckling surgery or cataract surgery causing iatrogenic trauma to the vertical muscles).

Sudden onset hypertropia in a middle aged or elderly adult may be due to compression of the trochlear nerve and mass effect from a tumor, requiring urgent brain imaging using MRI to localise any space occupying lesion. It could also be due to infarction of blood vessels supplying the nerve, due to diabetes and atherosclerosis.

Associated defects

Refractive errors such as hyperopia and Anisometropia may be associated abnormalities found in patients with vertical strabismus.

Sign and symptoms:

- Strabismic amblyopia, (due to deprivation / suppression of the deviating eye)
- cosmetic defect (most noticed by parents of a young child and in photographs)
- Head tilt to compensate for the eye misalignment.

Face turn, depending on presence of binocular vision in a particular gaze

- diplopia or double vision - more seen in adults (maturity / plasticity of neural pathways) and suppression mechanisms of the brain in sorting out the images from the two eyes.
- Cyclotorsional deviation of the eyes (rotation around the visual axis), particularly when the root cause is an oblique muscle paresis causing the hypertropia.

Treatment

In general, strabismus can be approached and treated with a variety of procedures. Depending on the individual case, treatment options include:

- Correction of refractive errors
- Prism therapy (if tolerated, to manage diplopia).if angle is small under 10 PD for example: hypertropia of 8 (RE=4 base down and LE= 4 base up.
- Patching (mainly to manage amblyopia in children and diplopia in adults)
- Botulinum Toxin (Botox) injection
- Surgical correction

Surgical correction of the hypertropia is desired to achieve binocularity, manage diplopia and/or correct the cosmetic defect. Steps to achieve the same depend on mechanism of the hypertropia and identification of the defective muscles causing the misalignment. Various surgical procedures have been described and should be offered after careful examination of eyes,