Ocular Motility Changes in Orbital Disorders

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DEFINITION OF EXTRAOCULAR MOTILITY DISORDERS: Disorders that feature impairment of eye movements as a primary manifestation of disease. These conditions may be divided into infranuclear, nuclear, and supranuclear disorders. Diseases of the eye muscles or oculomotor cranial nerves (III, IV, and VI) are considered infranuclear. Most of these infranuclear disorders are located in the orbits.

Ocular motility changes and subsequently diplopia are the second most common presentation for orbital disorders. (second to proptosis)

Ocular motility changes may be due to a trivial cause as orbital myositis or orbital hematoma and also may be due to a life threatening disease as mucormycosis or orbital metastasis. Accordingly their early detection is mandatory general ophthalmologists as well as neuro-ophthalmology, strabismus and orbit specialists.

In orbital disorders ocular motility changes may be due to one or more of 3 main etiological groups; myogenic, neurogenic and mechanical. Diseases of the extraocular muscles can produce motility disturbances in two ways: (1) the disease process can affect the muscle's ability to contract and thus cause weakness and, (2) the muscle may be stiffened by disease, causing a restriction of muscle movement by tethering.

Diseases of the ocular motor nerves in orbital disorders most commonly present as ophthalmoplegia due to affection of multiple cranial nerves. Isolated single cranial nerve affections are uncommon in the orbit due to its peculiar anatomic features.

Mechanical interferance with ocular motility may occur with some orbital disorders as tethering of the EOM or fascia in blow-out fractures or splinting of the globe or optic nerve by a large orbital tumor.

Unlike supra nuclear and nuclear (intracranial), infra nuclear (orbital) disorders are not presented with fixed patterns simply because in most cases the final extraocular motility changes are due to interplay of the myogenic, neurogenic and mechanical factors.

The aim of this presentation is to increase the awareness of the general ophthalmologist with the orbital disorders as an important item in ocular motility disorders. Same time, to refine the ability of strabismus, neuro-ophthalmology and orbit specialists to evaluate the changes in extraocular motility changes associated with orbital disorders.