

# Tolosa Hunt Syndrome

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The condition of painful ophthalmoplegia with hemicranial or periorbital pain, ocular motor nerve palsy of the same side and sensory loss in ophthalmic and/or maxillary region of trigeminal nerve constitutes Tolosa-Hunt syndrome [1]. The yearly incidence of the ophthalmoplegia syndrome is only one per million [2, 3]. The recurrent ophthalmoplegia shows granulomatous inflammation with epithelioid cells and giant cells in the cavernous sinus [4]. The nonspecific inflammation of the cavernous sinus or superior orbital fissure causes constant pain and damages the cranial nerves of III (oculomotor), IV (trochlear), and VI (abducens), triggering ophthalmoparesis [5]. The exact cause of ophthalmoplegia syndrome is unknown, but similar symptoms may be attributable or triggered by trauma, inflammation and infection such as periostitis, abscess, herpes zoster, actinomycosis and sarcoidosis, vascular causes such as carotid-cavernous fistula, primary cavernous sinus thrombosis, aneurysm and carotid dissection, or neoplasms such as lymphoma, pituitary adenoma and nasopharyngeal tumor. More than one-fifth of cases is due to recurrent ophthalmoplegia, while almost a third is due to tumors. There is no gender nor geographical preponderance of the syndrome, which was founded in 1954. Vaccination with mRNA-based COVID-19 vaccine may trigger the syndrome [6] where the patient presented with left eye pain and left-sided headache with decreased vision and binocular diplopia. The ophthalmoplegia resulted in ptosis and afferent pupillary defect on the same side while left cavernous sinus was hyperattenuated on CT scan and enhancement in left orbital apex into cavernous sinus was established through magnetic resonance modalities. However, the prospect of thrombosis and coagulation abnormalities associated with SARS-CoV-2 is well pronounced [7]. Hence, patients who present with Tolosa Hunt Syndrome should be evaluated for SARS-CoV-2. The rare syndrome usually occurs in middle age, around 40 years of age though this condition may occur between 10 and 80 years old [1, 2]. The recurrent ophthalmoplegia is usually unilateral but occasionally may occur bilaterally. Tolosa-Hunt syndrome is not a lethal condition, but sight may be threatened if left untreated, and inflammation encompasses beyond the cavernous sinus affecting the optic nerve. Characteristically, the prognosis for Tolosa-Hunt syndrome is considered good, and patients usually respond to corticosteroids. Relapses can occur in as many as 40% of patients successfully treated for Tolosa-Hunt syndrome [4]. These characteristic symptoms occur on the same side but may be observed on the opposite side, or even both eyes may be affected. Spontaneous remission may occur after two to three months without medication but with the possibility of persistence of cranial nerve deficits, but the risk of re-emergence was found higher on those treated with steroids alone compared to those consumed steroids followed by steroid-sparing agents,  $p < 0.034$  [4]. The diagnostic criteria is classified in the International Classification of Headache Disorders as one of the painful cranial neuropathies [6]. The graduality of onset or number of remissions of symptoms does not forecast the nature of the primary process. Painful ophthalmoparesis or ophthalmoplegia is the distinctive feature of this syndrome and most often occurs unilateral, although bilateral cases have been described. Pain is usually stabbing or shooting occurring in the periorbital region or retro-orbital area. Pain may precede ophthalmoplegia, where periods of remission and relapsing can occur. Ophthalmoplegia of the three ocular motor nerves are involved where oculomotor and abducens nerves involved more than half of cases [2]. Approximately a third of cases affect the ophthalmic branch of the trigeminal nerve and trochlear nerve; the former involvement results in paresthesia of the forehead. The sympathetic nerves may be involved in producing Horner syndrome with miosis. The involvement of parasympathetic nerves surrounding the oculomotor may also cause pupillary dysfunction. Unusual extension of the syndrome involves maxillary and mandibular components of the trigeminal nerve and facial nerve, and rarely to the optic nerve causing permanent loss of visual acuity. The syndrome described by Dr. Eduardo Tolosa seldom demonstrated residual neurological deficits [1]. The diagnosis of Tolosa-Hunt syndrome is

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usually one of exclusion where the diagnostic criteria include unilateral headache, presence of a granulomatous lesion of orbit or superior orbital fissure or cavernous sinus detected through MRI or biopsy (which is technically difficult), paresis of oculomotor, trochlear and/or abducens cranial nerves and an indication of headache preceded two weeks before paresis of oculomotor and where the headache is localized over the ipsilateral eye and brow [4]. The MRI shows the cavernous sinus thickening due to the existence of abnormal soft tissue and convexity of the lateral wall of the cavernous sinus [3]. The intracavernous carotid artery was found to be constricted or showing structures of segmental narrowing. Other blood investigations such as blood glucose, thyroid function tests, fluorescent treponemal antibody, antinuclear antibody, lupus erythematosus preparation, antineutrophil cytoplasmic antibody, serum protein electrophoresis, and HIV titer are helpful in eliminating other possible conditions. CSF studies, including cell count and differential, protein, glucose, fungal and bacterial cultures, Gram stain, cytology and CSF angiotensin-converting enzyme, are also conducted to disregard other possible conditions such as systemic lupus erythematosus, neurosarcoidosis and vasculitides [1, 8]. Largely, investigation results of CSF are unremarkable. A trial of corticosteroids would reduce pain within three days and improve cranial nerve dysfunction with a reduction of volume of abnormal tissue [1, 9]. It takes weeks to months for the resolution of ophthalmoparesis. The response from steroids may also occur from those having cancers or vasculitis mimicking Tolosa Hunt Syndrome, and hence, a proper assessment is required to diagnose the syndrome of exclusion. Other medications that may be used are methotrexate [10] and azathioprine [11].

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