Eyes wide shut: Anisocoria as an atypical presentation of Tolosa-Hunt Syndrome (THS) – A case report

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Background

- Third cranial nerve palsy is characterized by complete or partial ptosis, mydriasis, anisocoria and lack of light reaction.
- Clinical presentation can be a combination of these symptoms
- Common causes of third cranial nerve palsy include infarction, hemorrhage, demyelination of nerve, trauma, meningitis, tumor, inflammation, thrombosis of cavernous sinus, and AV fistula.
- This case report aims to demonstrate our workup of a third cranial nerve palsy that lead to diagnosis of a rare syndrome in order to add more to the body of knowledge for this disorder.

History of Presenting Illness

- A 63-year-old female with no significant past medical or surgical history presented with a 4 day history of headaches. It is located at the left frontal portion of her head and to the medial aspect of her left eye. She endorsed pain associated with diplopia.
- Provoking factors include pressing and closing the left eye while relieving factor was rest only.
- She denied fever, chills, cough, shortness of breath, chest pain, abdominal pain, changes in bowel or bladder habits, numbness or tingling in all extremities, skin rashes, head or eye trauma.
- Patient was originally from Mexico. She works with cattle in Mexico
- She endorsed using eyedrops after getting dust in left eye 2 months ago while working at a farm in Mexico. Otherwise no other ophthalmological history.
- She denies smoking, alcohol and drug abuse.
- Patient was in monogamous relation with her husband throughout her life.

Physical Examination

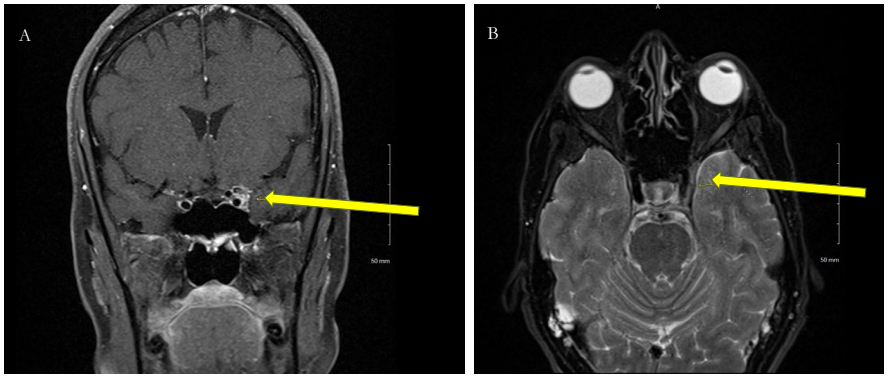
- Patient had partial ptosis, 7-8mm dilated left pupil with internuclear ophthalmoplegia and tenderness on left side of forehead on the day of admission.
- Pupil were reactive to light and consensual bilaterally at first. On second day of admission, left pupil become non-reactive to light and patient developed complete ptosis.
- All other examination was unremarkable.

Laboratory Studies

Complete Blood Count	Blood Chemistry	Inflammatory Markers	Lumbar Puncture	Autoimmune workup	Coagulation Studies	Infections	Miscellaneous
White blood cells (8.1K/ul)	Blood Urea Nitrogen **(<5mg/dl)**	Erythrocyte Sedimentation Rate **(67mm)**	WBC **(11/mm3)** glucose **(83mg/dl)** Protein **(32.5mg/dl)**	Antinuclear Antibody **(Negative)**	Prothrombin Time **(13.5seconds)**	SARS COV-2 **(Negative)**	Hemoglobin A1C **(5.6%)**
Hemoglobin (12.1g/dl)	Creatinine **(0.71mg/dl)**	C- Reactive Protein **(1.10mg/dl)**	CCF culture **(No growth)**	Myeloperoxidase antibodies **(Negative)**	International Normalized Ratio **(1.18)**	RPR **(Non-Reactive)**	Urine drug screen **(Negative)**
Hematocrit (37.9%)	Glucose **(121mg/dl)**		Meningitis Encephalitis panel **(Negative)**			Human immunodeficiency virus **(Negative)**	
Platelets (426K/ul)	Albumin **(3.3g/dl)**		Cocci diodes panel **(Negative)**				
Mean Corpuscular Volume (89.4fl)	EGFR **(90.9 mL/min/1.73m*2)**		Non -Gynecologic cytology **(Negative)**				
Neutrophils (61%)	Calcium **(9.7mg/dl)**		Lactate Dehydrogenase **(21U/L)**				
Lymphocytes (29%)			Fungal Culture **(Negative)**				
			Cryptococcal antigen **(Negative)**				
			VDRL **(Negative)**				

Radiographic Imaging

Computed Tomography (CT) scan of brain without contrast, Computed Tomography Angiography (CTA) of head and neck were negative. Magnetic Resonance Imaging (MRI) of brain and orbit revealed enhancement of the left cavernous sinus with slight tracking of the inflammation into the left optic nerve sheath as shown in figure A and B.



MRI of brain with emphasis to orbits with and without contrast taken ~2 days into admission. A) T1 coronal image. Note the area of enhancement located in the left cavernous sinus as indicated by arrow. B) T2 weighted axial image from same imaging study as figure A showing similar area of enhancement located along nerve sheath in cavernous sinus, note enhancement area is darker in this image.

Diagnosis

- Definition: 1) ipsilateral headache for at least 8 weeks when untreated. 2) Irritation or damage to CN III, IV or VI. 3) Relief of pain within 48 hours of starting steroids. 4) testing to rule out other conditions (e.g. neoplasm, infection, aneurysm,).
- Based on the definition above with laboratory, imaging and physical exam findings patient was believed to have Tolosa-Hunt Syndrome.

Treatment

- Patient was started on high dose prednisone with slow tapering over an 8 week period.
- On day of discharge patient headaches had subsided and ptosis had begun to improve.
- Patient was one month after completing steroids and reported 60% improvement in her symptoms. She does endorse residual diplopia and dizziness. Overall, improvement in eye movement and pupil

Discussion

- Tolosa-Hunt syndrome is a rare syndrome with 1 case per million per year. It was first reported by Tolosa in 1954. Tolosa described this syndrome as the combination of a patient with ipsilateral progressive visual loss, left orbital pain, reduced sensation over the first division of the trigeminal nerve and total left ophthalmoplegia. 7 years later, Hunt and coworkers reported the therapeutic efficacy of systemic corticosteroids with prompt, dramatic improvement of signs and symptoms.
- People from 1 to 8th decade of life are affected by this syndrome with no gender predilection. It can affect either eye with rare involvement of bilateral eyes.
- Contrast enhanced MRI should be used as an initial diagnostic imaging. Abnormal area of soft tissues in the region of the cavernous sinus is reported in several studies.
- Steroids are the only treatment option with no clear duration as of yet.
- It is caused by non-specific, chronic inflammation of the septa and wall of the cavernous sinus with lymphocytes and plasma cells infiltration and proliferation of fibroblast. Inflammation in tight connective tissue exert pressure upon the penetrating nerves.
- The aim of our case presentation is to increase the awareness of this rare syndrome as well as to highlight the approach to evaluate this diagnostic conundrum. Tolosa Hunt syndrome in the differential diagnosis of ptosis with pupillary dilation leads to early diagnosis and proper treatment.

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