Correspondence

The authors report no conflict of interest and received no financial support or sponsorship.

0008-4182/17/$-see front matter © 2020 Canadian Ophthalmological Society. Published by Elsevier Inc. All rights reserved.
https://doi.org/10.1016/j.jcjo.2020.01.003

Tolosa-Hunt syndrome: case series on the timed use of diagnostic magnetic resonance imaging

Tolosa-Hunt syndrome refers to an idiopathic granulomatous inflammation of the cavernous sinus or superior orbital fissure that manifests as painful ophthalmoplegia.1,2 Clinical features include periorbital pain in conjunction with ipsilateral ocular motor nerve palsies (third, fourth, and/or sixth cranial nerves), as well as possible involvement of the ophthalmic, maxillary, and mandibular divisions of the trigeminal nerve and the facial nerve.3,4 Despite its tendency to resolve spontaneously, the syndrome is noted to relapse and remit, and it is known to be glucocorticoid responsive.5 With an estimated annual incidence of one case per million, the syndrome is rare and occurs equally among men and women.6

According to the diagnostic criteria of the International Headache Society, patients present with the previously noted constellation of symptoms.4 In 2004, the criteria were redefined to include magnetic resonance imaging (MRI) or biopsy to identify granulomatous inflammation of the superior orbital fissure or cavernous sinus, which can be particularly useful in ruling out other neoplastic, infiltrative, and infective etiologies. Contrast-enhanced MRI findings may include abnormal tissue in an enlarged cavernous sinus appearing isointense to gray matter and well enhanced with gadolinium.7 However, in certain cases initial MRI can be normal, calling into question the timing of brain imaging and its necessity in diagnostic confirmation.8 Here we present a case series involving 2 patients with Tolosa-Hunt syndrome who initially presented with normal MRI.

The 2 cases in this series initially presented with a referral between 2015 and 2016. Patients had previously undergone a contrast-enhanced MRI that revealed no abnormal pathology of the cavernous sinus or superior orbital fissure, but on repeat scans they had enhancing lesions within the region. A retrospective chart review was conducted to document relevant presentation, management, and outcome information.

A 47-year-old female with a known history of diabetes and obesity was referred for left abducens palsy associated with left-sided periorbital paresthesia and left-sided headaches of 3 months’ duration. The patient had previously developed left pupil-sparing oculomotor nerve palsy (diplopia and left ptosis) associated with headache 1 year before the referral. She underwent MRI within 2 months, which revealed no noted abnormalities aside from microangiopathic disease (Fig. 1A). The oculomotor nerve palsy and the headache resolved over 3 months, and it was attributed

to the known diabetes. One year later, she developed new abducens nerve palsy on the same side. Contrast-enhanced brain MRI was performed at an outside facility within 1 month of the onset of the left abducens palsy, and findings were normal (Fig. 1B). She was referred to neuro-ophthalmology for ongoing headaches and diplopia. Repeat MRI brain with gadolinium was done 4 months after the onset of the abducens nerve palsy and revealed an interval-
enhancing lesion in the anterior cavernous sinus (Fig. 1C, D). Autoimmune and syphilis screening were negative. The patient declined lumbar puncture. After a trial course of oral prednisone, her symptoms were significantly alleviated, including her headaches and diplopia. Repeat imaging 2 months later showed a reduction in the intervals of the enhancing soft tissue in the anterior cavernous sinus (Fig. 1E, F). Prednisone was tapered and stopped over 6 months. She had remained clinically stable without recurrence of headaches for 3 years.

Fig. 2—Magnetic resonance imaging findings of 72-year-old male with left-sided Tolosa-Hunt syndrome. Initial axial imaging and coronal imaging (A, B) were normal. Follow-up imaging 6 weeks after initial presentation revealed an asymmetric enlargement of the left optic nerve sheath, with abnormal enhancing tissue present in the left anterior cavernous sinus (C, D). After discontinuation of prednisone, an interval increase was noted in the size of the lesion (E). Full resolution of the lesion (F) occurred after a repeat set of steroids.
A 72-year-old male presented with a left abducens nerve palsy that was preceded by headaches on the ipsilateral side for a few days. His medical history included prior Mycobacterium avium complex infection and previous Hodgkin’s lymphoma, which was in remission. He denied symptoms of giant cell arteritis. Autoimmune screening, erythrocyte sedimentation rate, and C-reactive protein were within normal limits. A contrast-enhanced MRI of the brain was normal. A lumbar puncture was performed, and cerebrospinal fluid constituents as well as cultures and cytology were normal. Two weeks later, the patient presented with worsening of the left-sided headache, new-onset left oculomotor nerve palsy, and left facial numbness in the distribution of the ophthalmic division of the trigeminal nerve. The patient was admitted to the hospital, and a repeat contrast-enhanced MRI at this time revealed an interval lesion in the left cavernous sinus accounting for the symptoms (Fig. 2). With a 1 mg/kg course of prednisone, there was a dramatic improvement in the patient’s headache and a partial improvement of the oculomotor nerve palsy. The paresthesia and ptosis had entirely resolved. It is important to note that hematology was consulted and noted the abnormal enhancing tissue within the anterior cavernous sinus to be an unlikely presentation of recurrent Hodgkin’s lymphoma, which also typically improves with steroids, narrowing the most likely diagnosis to Tolosa-Hunt syndrome. Twelve months later (9 months after the discontinuation of prednisone), the patient had a repeat MRI that revealed an increase in the size of the enhancing tissue. Six months later, the patient presented with a recurrence of Tolosa-Hunt; he was experiencing right frontal headaches and paresthesia in the ophthalmic division region of the trigeminal nerve. He was treated with another course of prednisone, which resulted in a full resolution of the lesion on repeat imaging.

In this series, 2 cases of Tolosa-Hunt syndrome presented initially with normal brain MRI scans after the onset of diplopia and headache, with repeat imaging later revealing lesions congruent with a diagnosis of Tolosa-Hunt syndrome. We demonstrate the importance of repeat imaging to establish the diagnosis. According to the 2004 modifications, the International Headache Society redefined the diagnostic criteria for Tolosa-Hunt syndrome to include the identification of a granuloma via either MRI or biopsy. The symptomatology and clinical presentation involved in Tolosa-Hunt syndrome may be common to other neuro-ophthalmic conditions, requiring confirmation with medical imaging or biopsy. MRI works to elucidate the main cause of painful ophthalmoplegia, differentiating trauma, neoplasm, aneurysm, or inflammation and to rule out other causes of painful ophthalmoplegia. Although medical imaging is of great clinical utility, we suggest that it should not be a mandate for the diagnosis of Tolosa-Hunt syndrome, as a subset of patients present with normal or delayed MRI findings. Previous literature has quoted patients presenting with normal neuroimaging to be 18% and 33% of the total patient population. In this population, it is unclear whether repeat MRI did in fact reveal inflammatory changes supporting the diagnosis. Other studies have also demonstrated no clear radiographic evidence in multiple cases of presumptive Tolosa-Hunt syndrome. In the case of a clinical presentation compatible with a diagnosis of Tolosa-Hunt syndrome and normal MRI, we suggest repeat imaging a few days to weeks after initial presentation, especially if there is persisting headache, no improvement in the cranial nerve palsy as expected in other ischemic conditions, or progression to involve other cranial nerves within the cavernous sinus or the superior orbital fissure. Although there is currently no evidence in the literature to support a specific timeline, an associated radiographic lag time may be expected in relation to patient symptomatology.

Furthermore, MRI is also used in patient follow-up, with some patients showing complete lesion resolution after successful steroid therapy. However, it should also be noted that as with symptom onset, the cessation of symptoms does not always correlate with pathology on imaging, with radiographic evidence sometimes lagging behind clinical presentation. Previous literature has shown patients with residual lesions of smaller size, despite successful steroid treatment. Therefore, repeat MRI is also recommended after a diagnosis of Tolosa-Hunt syndrome. With the lack of guidelines regarding the exact timing of the repeat imaging, we suggest that this be decided clinically by the presence and the extent of the neurological symptoms.

In the context of a suspected Tolosa-Hunt syndrome diagnosis, repeat brain MRI is encouraged, as a subset of patients develop delayed presentation on imaging.

Mirriam Mikhail, Alfred Basilious, Pejman Jabehdar Maralani, Arun N.E. Sundaram
University of Toronto, Toronto, Ont.


Corresponding to:
Arun N.E. Sundaram; arun.sundaram@sunnybrook.ca.

References
2 Tolosa E. Periarteritic lesions of the carotid siphon with the clinical features of a carotid infraclinoidal aneurysm. J Neurol Neurosurg Psychiatry 1954;17:300.
Ocular myiasis secondary to *Dermatobia hominis*

A 15-year-old male presented to the emergency department with a 1-week history of left upper eyelid swelling and erythema. His symptoms initially presented while he was on vacation in Costa Rica. His medical history was significant for attention-deficit hyperactivity disorder and Tourette syndrome. The diagnosis of a hordeolum was made, but despite topical erythromycin and subsequent oral cloxacillin, no improvement was noted. The patient was admitted to hospital for monitoring and intravenous cefazolin. A computed tomography scan showed soft tissue swelling consistent with preseptal cellulitis (Fig. 1). Intravenous vancomycin and ceftriaxone were added by the infectious disease service.

On examination, visual acuity was 6/6 in the right eye and 6/7.5 in the left eye. Significant edema and erythema of the left upper lid was appreciated, with a small central pore noted on the eyelid margin medially. The bulbar and palpebral conjunctiva were injected. The rest of the ocular examination was within normal limits in both eyes. When the intravenous antibiotics did not decrease swelling, an incision and drainage of the lesion was planned.

Under general anaesthesia, the central pore on the eyelid was enlarged via an anterior cutaneous incision. When no purulent material was expressed from the anterior approach, a posterior cruciate incision through conjunctiva and tarsus was made. A small larva was discovered in the wound (Fig. 2). The larva was removed, and the incisions were left to heal by secondary intention. Erythromycin ointment was applied to the surgical site and a temporary patch was placed. The larval specimen was sent to the laboratory for identification and was determined to be of the species *Dermatobia hominis* (human botfly, American warble fly).

Postoperatively, the patient showed significant improvement. He was discharged from hospital on oral amoxicillin and topical erythromycin. By the 6-week follow-up visit, the wounds had healed well and his symptoms had completely resolved. Visual acuity measured 6/6 in both eyes and there were no signs of persisting infection.

Palpebral myiasis is a rare cause of preseptal cellulitis. Here we present a pediatric case of palpebral myiasis caused by *D. hominis* in a patient with recent travel to Central America. *D. hominis* is native to Central and South America. Cases of myiasis are relatively rare in Canada, with the majority in patients with recent travel to endemic areas.