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Case Report

Cavernous sinus syndrome with painful ophthalmoplegia: aspects of differential diagnosis to consider

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Abstract

Introduction

Cavernous sinus syndrome with painful ophthalmoplegia is a rare disorder that affects 1-2 individuals per million annually and requires an assertive investigation, considering the multiple alternative diagnostic options that can impact the patient's clinical outcome. When the etiology is idiopathic, it is referred to as Tolosa-Hunt syndrome.

Objectives

The objective of this study is to report the case of a patient diagnosed with Tolosa-Hunt syndrome.

Comment

Tolosa-Hunt syndrome clinically manifests with headache, severe eye pain accompanied by ophthalmoplegia and cranial oculomotor nerve palsy. The diagnosis is made through a combination of clinical assessment, laboratory analysis, imaging studies, and the exclusion of other potential etiologies. This case report discusses the investigation and clinical management of a previously healthy patient presenting with painful ophthalmoplegia, diagnosed as Tolosa-Hunt syndrome and treated with corticosteroids, who presented a favorable response to the treatment.

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Introduction

Cavernous sinus syndrome results from pathological processes that compromise the cavernous sinus, with signs and symptoms varying according to the structures involved. The cavernous sinus is part of the intracranial venous system and contains the internal carotid artery and cranial nerves (oculomotor, trochlear, abducens, and trigeminal—branches V1 and V2) (1). Painful ophthalmoplegia results from a nonspecific inflammatory process involving the cavernous sinus. Ocular motor disorders are associated with dysfunction of the extraocular muscles due to changes in the muscle or its cranial nerves (2).

Tolosa-Hunt syndrome (THS) is an inflammatory granulomatous condition of idiopathic etiology that affects the cavernous sinus, superior orbital fissure, or orbit. It has an estimated incidence of 1-2 cases per million inhabitants per year (3,4). The presence of granulomatous inflammation composed of lymphocytes and plasma cells increases the intrinsic pressure in the cavernous sinus, compressing the adjacent neurovascular structures (5).

Initial manifestations are usually acute and include frontal headache and recurrent unilateral periorbital pain, which may persist for one or more weeks. Subsequently, progressive involvement of the extraocular muscles is observed, resulting in eyelid ptosis and diplopia (6,7).

The diagnosis of THS is established by integrating clinical, laboratory, and imaging findings, and it is essential to rule out other causes of painful ophthalmoplegia (5). Magnetic resonance imaging (MRI) of the skull and orbits is the main imaging method for diagnosis, with abnormal findings in approximately 92% of patients (7,8); however, the absence of abnormalities does not rule out the diagnosis (2,7,9). The classic treatment involves the use of corticosteroids (3,4,6,7).

The objective of this study is to report a case of THS treated at Hospital Santo Antônio – Blumenau/Santa Catarina, and to elucidate the approach to differential diagnoses that include cavernous sinus syndrome with painful ophthalmoplegia.

Case Report

A 59-year-old male patient, previously healthy, sought emergency care due to sudden onset of frontal-temporal headache seven days prior, with progressive intensity, intermittent, no identified triggering factors, partially improved with simple analgesia. In the last three days, he developed dizziness, diplopia, and right eyelid ptosis, with no other complaints. On physical examination, the patient had isophotoreactive pupils and preserved visual fields. Impaired ocular motility was noted in the right eye, with deficit in incycloduction, excycloduction, and adduction affecting the superior rectus, medial rectus, inferior rectus, superior oblique, and inferior oblique muscles, consistent with incomplete paralysis of the third and fourth cranial nerves on the right (Figure 1). Vertical diplopia was also observed. General physical and neurological examination showed no other abnormalities.

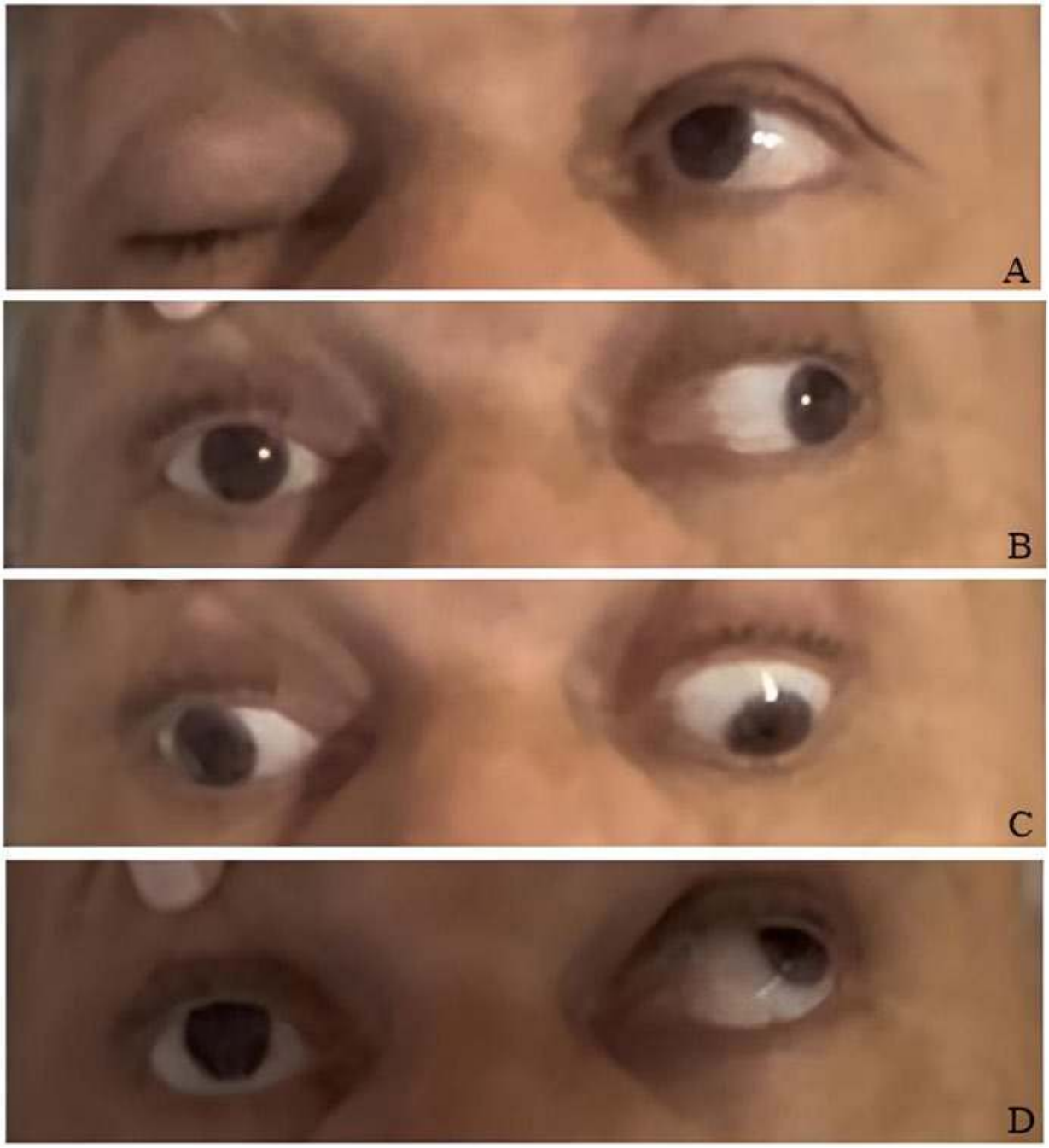

Figure 1. Assessment of extraocular motility. (A) Resting position showing right-sided palpebral ptosis. (B) Limitation of adduction of the right eye. (C) Limitation of incycloduction of the right eye. (D) Limitation of excycloduction of the right eye.

Imaging tests were performed: computed tomography angiography of the skull showed no abnormalities, and MRI of the skull and orbits showed no acute abnormalities. In addition, the following laboratory tests showed normal results: complete blood count, renal function, C-reactive protein, erythrocyte sedimentation rate, anti-HIV, VDRL, FAN, complement C3, complement C4, thyroid function, lipid profile, cerebrospinal fluid evaluation (glucose, proteins, leukocytes, bacterioscopy, culture, and fungal testing).

Given the clinical suspicion of THS, therapeutic testing was initiated with prednisone 1 mg/kg/day orally, with progressive clinical improvement observed 48 hours after the start of treatment, resulting in hospital discharge. Reevaluated on an outpatient basis 12 days after discharge, with complete remission of signs and symptoms, gradual withdrawal of corticosteroids had already begun. The patient remains asymptomatic one year after the event.

Comments

The identification of clinical signs of cranial nerve impairment in patients with headache should be considered an important indicator for evaluating differential diagnoses, given the possibility of more serious underlying causes. Therefore, clinical practitioners should seek a detailed evaluation in order to identify the origin of the signs and direct the investigation (9).

A 2021 study by Kim and Oh (3) showed that the cranial nerve most affected in THS was the abducens nerve, present in 72.73% of cases, followed by the oculomotor nerve and trochlear nerve, both involved in 45.45% of patients. The diagnostic criteria for THS, defined in 2018 by the International Headache Society, are as follows: Criterion A - unilateral orbital or periorbital headache related to Criterion C; Criterion B - granulomatous inflammation in the cavernous sinus, superior orbital fissure, or orbit on magnetic resonance imaging or biopsy, associated with paresis of one or more ipsilateral oculomotor cranial nerves (III, IV, and/or VI); Criterion C - headache must be ipsilateral to granulomatous inflammation and precede cranial nerve paresis by more than two weeks, or develop simultaneously with it; Criterion D - clinical picture not better explained by another diagnosis (10).

This case presented as painful ophthalmoplegia with incomplete paralysis of the third and fourth cranial nerves on the right side. Investigation began with imaging and laboratory tests to rule out other etiologies. Criteria A, C, and D were positive, therefore, diagnosed with THS.

The first step in the diagnostic approach to cavernous sinus syndrome is to rule out more prevalent and potentially serious causes. To this end, imaging tests such as MRI of the skull and orbits, supplemented by cranial angiotomography, are recommended (11). At this point, the aim is to rule out causes such as neoplasms, intracranial aneurysms, carotid-cavernous fistulas, carotid artery dissection, and primary cavernous sinus thrombosis (1,11,12). Laboratory tests such as complete blood count, inflammatory markers, initial rheumatological investigation, serology, and thyroid function should also be performed. Systemic inflammatory diseases such as vasculitis, systemic lupus erythematosus, and sarcoidosis can present with painful ophthalmoplegia, and thyroid function abnormalities and glycemic control should be considered in the investigation. Infectious processes should also be ruled out (12–14).

Furthermore, it is necessary to rule out headache attributed to ischemic paralysis of the oculomotor nerve, whose diagnosis requires signs of ischemic paralysis of the nerve in complementary examinations, in addition to vascular risk factors (2,10). Another diagnosis to consider is recurrent painful ophthalmoplegic neuropathy, which requires at least two episodes of migraine associated with ophthalmoplegia, ptosis, or mydriasis (2,15–17). Orbital pseudotumor, unlike THS, often involves the optic nerve, with decreased visual acuity and involvement of the extraocular muscles (1). In the absence of specific findings for differential diagnoses, the cause is considered idiopathic. THS remains a diagnosis of exclusion whose confirmation is indirect, substantiated by the therapeutic response to corticosteroids. In the clinical picture presented, THS was diagnosed and prednisone was started, with an excellent response.

THS is classically managed with corticosteroids, although there are no standardized guidelines regarding the choice of drug, formulation, route of administration, nor optimal dosage. Rapid response to corticosteroid therapy occurs within one to three days (3,4,6,7), as in the present case.

THS is an uncommon disease, whose diagnosis follows the criteria of the International Headache Society (10). Although the prognosis is favorable, the recurrence rate of THS varies between 21% and 50% (3,11). It is essential to maintain rigorous clinical follow-up, with periodic MRI scans to monitor the continued effectiveness of treatment and rule out the emergence of alternative etiologies (16). Thus, this report and the practical approach to the differential diagnoses of THS are relevant to the syndromic management in question.

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