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Cutting the edge of idiopathic recurrent orbital myositis

Case Report

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Abstract: The spectrum of orbital inflammatory diseases ranges broadly from specific diseases as connective tissue disorders, thyroid ophthalmopathy to non-specific inflammations, which may involve one or multiple structures of the orbit and/ or the surrounding sinus. Idiopathic orbital myositis (IOM) may be a localized process or it can be secondary to systemic diseases. We report 4 patients affected by IOM; in all relapsing diplopia was the main complaint, associated with orbital pain in 3 and with abnormal visual evoked responses in 2. Computed tomography (CT), magnetic resonance imaging (MRI) supported the diagnosis revealing enlargement, altered signal intensity of affected muscles. Repeated MRI scans and extensive laboratory examinations comprising of the search for a remote malignacy, lymproliferative, connective tissue diseases, thyroid ophthalmopathy were necessary to confirm the diagnosis. Oral or/and intravenous steroids were main treatments; relapses often occurred when steroid was tapered down. Intravenous immuneglobulins and azathioprine was used in one refractory case

Keywords: *Idiopathic orbital myositis • Magnetic resonance imaging • Computed tomography*

1. Introduction

The spectrum of orbital inflammations ranges from specific diseases as connective tissue disorders, thyroid ophthalmopathy to non specific disorders involving orbital structures [1-8]. Idiopathic orbital myositis (IOM) may a localized process, involving primarily extraocular muscles without systemic involvement or it can be associated with systemic diseases [1-8]. Mimics of IOM include mass lesions, infections, trauma [1-8]. Typically, inflammation is unilateral and it can relapse [1-3,6]. Recurrences occasionally involve different muscles of the controlateral eye [1-3,6]. Diagnosis is usually made clinically on account of persisting, often recurrent orbital pain and signs of inflammation [1-8]. The purpose of this report is to present a case series of IOM possibly providing a frame work for the diagnosis.

2. Case report

2.1 Case 1

A 47-year-old woman experienced acute onset of left orbital pain and diplopia on lateral gaze. On admission, patient exhibited eye-lid swelling, paralysis of right lateral and both medial recta, normally reactive pupils. Remaining examination was normal. Computed tomography (CT) revealed enlargement of medial, inferior rectus on both side, of right superior rectus and superior oblique (Figure 1A). Visual evoked potentials (VEPs) showed prolonged P100 latency bilaterally (138-143 msec, normal <110). Visual fields and acuity was normal. Single fiber EMG (SFEMG), chest radiography gave negative results. Electromyography (EMG) of orbicularis oculi did not show signs of denervation. Negative laboratory results included erythrocyte sedimentation rate (ESR), creatine kinase (CK), thyrosine-based hormones, an-

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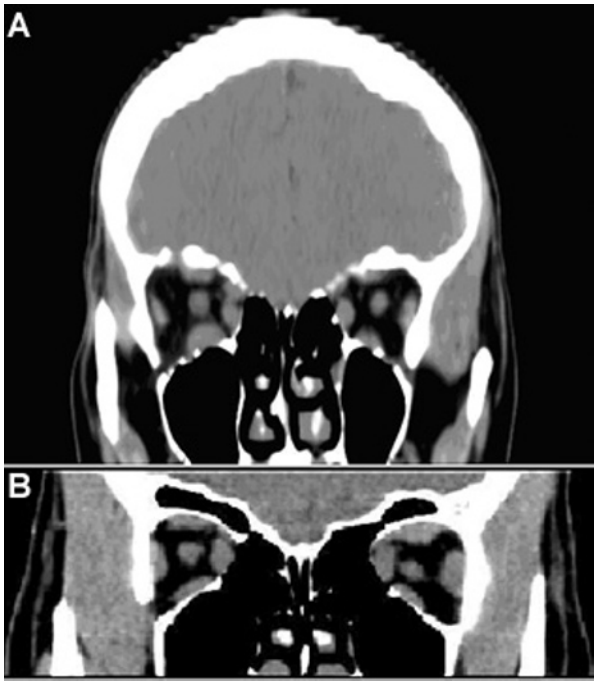

Figure 1. Coronal CT images from case 1 showing (A) enlargement of the belly of both medial and inferior recta, of right superior rectus and superior oblique.
Case 2 CT images (B) showed enlargement of left superior, both medial and lateral recta.

ti-thyroglobulin (TG Ab), thyroperoxidase antibodies (TPO-Ab), angiotensin-converting enzyme, B12 level, HIV1-2, anti-nuclear (ANA), extractable nuclear antibody (ENA), rheumatoid factor (RF), complement C3, C4, spinal fluid examination. Negative search for antibodies to acetylcholine receptors (AchRs), muscle tyrosin kinase (MuSK), voltage gated calcium channels (VGCC) excluded ocular myasthenia or Lambert-Eaton myasthenic syndrome (LEMS). Patient recovered fully with 15 day course of oral prednisone (1 mg/kg/daily) slowly tapered in 6 weeks. After 3 months, diplopia recurred due to weakness of lateral recta; patient showed dramatic response to a 3-day course of intravenous methylprednisolone (1 g/daily). Short lasting episodes of diplopia and ptosis were reported 4 times during 1st year of illness and at 6, 8, 9, 10 years since first onset. Patient since 3 years has benefit from azathioprine and low dose of steroids.

2.2 Case 2

A previously healthy 33-year-old woman presented after 18 month history of recurrent episodes, lasting each 2-3 weeks, with orbital pain, lid weakness, diplopia on either gazing. Examination revealed bilateral ptosis, impaired elevation, abduction, adduction of both eyes, periorbital swelling. Visual field and acuity, pupillary reaction to light, funduscopic examination, VEPs were normal. CT scans showed enlargement of both medial, lateral and left superior recta (Figure 1B). Normal laboratory tests included thyroid function, ANA, ENA, search for antibodies to AchRs and to MuSK. Intravenous methylprednisolone (1 g/daily for 3 days) followed by oral prednisone (50 mg every other day tapered to 25 mg) gave transient benefit; at 3 months painful diplopia recurred, again treated with oral steroids.

2.3 Case 3

A 49 year-old woman was admitted because of painful diplopia. She had for 11 years short-lasting episodes of relapsing diplopia and eye-lid weakness. On admission,general examination was normal; there were bilateral ptosis, restricted extraocular movement in either direction. The remaining cranial nerves, extremity strength, coordination, reflexes were intact. MRI scans revealed in Short T1 inversion recovery sequences (STIR) uniform signal hyperintensity of left superior rectus and elevator palpebrae; the belly and the tendon insertion of right medial, superior recta, elevator palpebrae and of all extraocular muscles in the left side appeared enlarged (Figure 2A,B). Blood cell count, ESR, liver, renal, thyroid functions, SFEMG were negative. Systemic autoimmune, connective tissue disorders were ruled out. Orbicularis oculi EMG showed denervation potentials. Oral prednisone (1 mg/kg/daily) gave benefit within 72 hours. The steroids were withdrawn over next 4 weeks. Patient at 6 months since admission suffered a recurrence, again treated with prednisone.

2.4 Case 4

A 55 year old hypertensive man presented acute onset of visual loss,painless diplopia on right lateral gaze, left–sided eye lid weakness. MRI showed thickening of right superior, medial, lateral recta. Extensive haematologic results were unremarkable, including thyroid function and search for anti TG and TPO antibodies. SFEMG was normal. The P100 component of VEPs on right side had prolonged latency (146 msec). Visual field, acuity, pupillary reaction to light, funduscopic examination were normal. Patient denied treatment. He experienced at least 4 recurrences in 3 years.

3. Discussion

Our patients presented an asymmetric involvement of external eye muscles, associated with abnormal VEPs in two (Table 1). Abnormalities of VEPs were congruent with worsening of diplopia and orbital pain, suggesting that this optic neuropathy could be induced by mechani-

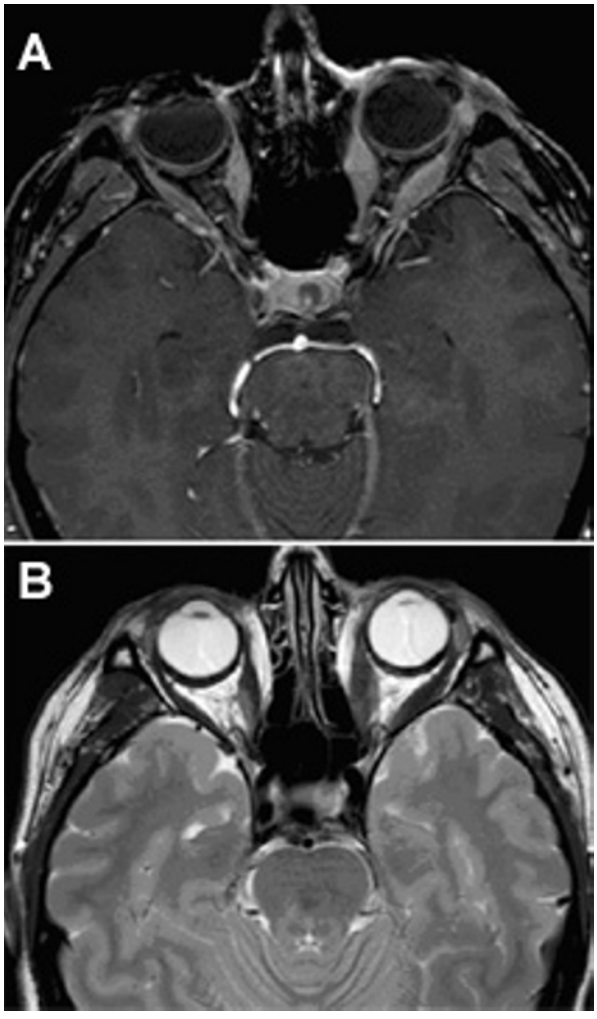

Figure 2. MRI (Philips 1,5T Akieva System) of case 3.
(A) T1 weighted Fast Field Echo (FFE) axial images (TR 25, TE 4,6) showing swelling and enhancement with Gd-DTPA of both medial and left lateral recta.
(B) Axial T2 weighted Turbo Spin Echo (TSE) sequences (TR 3000, TE 80) showing fusiform enlargement of both medial and left lateral recta.

cal compression by enlarged extraocular muscles at orbital apex or by direct inflammatory infiltration from the muscles as proposed by Matsuno et al. for their patient [8]. Negative laboratory screenings included complete cell blood count, inflammatory and tumour markers, ESR, CK, C-reactive protein, ANA, ENA, RF, search for antibodies to AchRs, MuSK, VGCC, thyroid stimulating hormones, T4, anti-thyroid-antibodies. In all patients vasculitis, lymphoproliferative diseases, disorders of the neuromuscular junction, thyroid-related ophthalmopathy were ruled out. CT and MRI scans in our cases showed enlargement, altered signal of suspected muscles, in absence of signs of orbital pseudotumor [2-7]. Multiple muscles were affected in their entirety, from origin to insertion differing from most common causes of orbital inflammation, such as the thyroid ophthalmopathy, which predilects muscle's belly [1,2,4-7]. Normal appearance of cavernous sinus, superior orbital fissure, intact sensation over trigeminal nerve distribution excluded a Tolosa–Hunt syndrome or other invading granulomatous processes [7]. Corticosteroids induced dramatic reversal of symptoms, but recurrences were observed during prednisone tapering down. Within relapses, after resolution of symptoms contrast–enhnced CT, MRI scans in case 1 and 2 showed recover. Idiopathic orbital inflammations refer to the inflammatory diseases that affect some or all structures of the orbit; in some cases, the process is extended beyond the orbit through the orbital apex into the cavernous sinus [1-3,6-7]. Histopathology may reveal non-specific, chronic polymorphic inflammatory infiltrates as in Grave's ophthalmopathy or perivascular granulomas as in Wegener's granulomatosis [2,3]. Siatkowski et al. [1] reported 100 cases of IOM studied retrospectively: the lateral rectus was affected in 33%,the medial in 29%,the superior in 23%,the inferior in 10% of patients. A single muscle was involved

Table 1. Clinical features of the four present cases with idiopathic orbital myositis (IOM).

Patients	Age/gender	Main symptoms at first onset	Weakness distribution at first onset	Associated optic neuropathy	Associated systemic diseases	Treatment	Clinical evolution/ relapses
Case 1	47 y/ F	Diplopia, orbital pain, visual impairment	Asymmetric. Left eye-lid, bilateral medial, right superior, lateral recta	Present	None	Oral, i.v. steroids, IVIg, azathioprine	Chronic, with partial recovery, 11 relapses in 10 y
Case 2	31 y/ F	Diplopia, orbital pain	Asymmetric. Bilateral eye-lids, medial,lateral, left superior recta	Absent	None	Oral, i.v. steroids	Recovery, 8 relapses in 2 y
Case 3	49 y/ F	Diplopia, orbital pain	Asymmetric. Bilateral eye-lids, medial, superior, lateral recta	Absent	None	Oral, i.v. steroids	Recovery, 7 relapses in 11 y
Case 4	63 y/ M	Painless diplopia, visual impairment	Asymmetric. Left eye-lid, right superior medial, lateral recta	Present	Mild hypertension	None	Chronic, with spontaneous recovery, 4 relapses in 3 y

M, male; F, female; Y, years; IV, intravenous ; IVIg,intravenous immuneglobulin

in 68%, 22% had two muscles,10% had more muscles affected. Avni-Zauberman et al. [6] reviewed the literature describing 6 new cases of relapsing migratory idiopathic orbital inflammation; painful diplopia and periorbital swelling were common signs. Pollard [4] diagnosed neuroradiologically the IOM of 7 children, showing isolated acute painful lateral rectus muscle palsy similarly to Fischer et al. adult case [5] who mimicked a 6th nerve affection. The differential diagnosis of IOM include focal myasthenia gravis, pathologic processes of the base of the skull, mitochondrial disorders as progressive external ophthalmoplegia, sarcoidosis, ophthalmoplegic migraine, lupus erythematosus, Wegener's disease, multiple post-infectious combinations of cranial nerve involvement [1-10]. The final diagnosis of IOM can be challenging due to difficulty in obtaining affected tissues or in using EMG as diagnostic tool [2,3,5,6]. Lee et al. patient [10] was thought to have cluster headache 6 years before MRI demonstrated thickened superior rectus muscle; Pagès et al. case [3] presented sudden lateral rectus palsy 2 years before CT scan revealed fusiform hypertrophy of affected muscle. Muscle biopsy should be deserved to unresponsive cases, histopathology previously demonstrated non-specific lymphocyte, macrophage, plasma cell infiltrates [2,6,7,9]. The pathophysiologic basis of IOM is still uncertain, therefore the treatment plans and the choice of immunomodulatory treatment remains empiric [6,11,12]. Mycophenolate mofetil (MM) was used successfully in 5 cases. MM has a rational consideration for treatment because it selectively prevents lymphocyte replication, it could be considered for patients with persistent or recurrent disease during treatment with corticosteroids or to avoid corticosteroids when they are contraindicated [12]. By concluding, our report highlights the importance of cautious history, detailed clinical examinations and meticulous neuroradiologic studies in patients with suspected IOM. IOM can be regarded by clinicians as a diagnosis of exclusion, which relies heavily on negative results from the baselined laboratory investigations [1-6,8-12]. The myositis can be detected on MRI or CT scans through thickening of the affected muscles, uptake of contrast medium, and on MRI through signal-intensity hyperintensity in T2 weighted images [5,6,8].

Declaration of interest

The authors have no conflict of interest or sources of funding.

The authors alone are responsible for the content and writing of the paper.

References

[1] Siatkowski RM, Capo H, Bryne SF, Gendron EK, Flynn JT, Muñoz M, Feurer WJ Clinical and echographic findings in idiopathic orbital myositis. Am J Ophthalmol 1994;118: 343-350

[2] Attarian S, Fernandez C, Azulay J-Ph, Serratrice J, Pellissier J-F, Pouget J. Myosites orbitaire: étude clinique,radiologique et profil évolutif. Rev Neurol (Paris) 2003;159:307-312

[3] Pagès M, Malanda G, Mayembo MA. Ophthalmoplegie indolore et rècidivante révélatrice d'une myosite orbitaire. Rev Neurol (Paris) 2005; 161: 224-225

[4] Pollard ZP. Acute rectus muscle palsy in children as a result of orbital myositis. J Pediat 1996;128:230-3

[5] Fischer M, Kempkes U, Haage P, Isenmann S. Recurrent orbital myositis mimicking sixth nerve palsy: diagnosis with MR imaging. AJNR 2010; 31: 275-276

[6] Avni-Zauberman N, Tripathy D, Rosen N, Ben Simon GJ. Relapsing migratory idiopathic orbital inflammation: six new cases and review of the literature. Br J Ophthalmol 2012; 96: 276-280

[7] Wasmeier C, Pfadenhauer K, Rösler A. Idiopathic inflammatory pseudotumor of the orbit and Tolosa-Hunt syndrome- are they the same disease? J Neurol 2002;249:1237-1241

[8] Matsuno K, Osako M, Osako S, Okano T, Kotake F, Usui M. A case of orbital myositis complicated with optic neuropathy-analysis of the pathological mechanism of optic neuropathy from magnetic resonance imaging findings. Nippon Ganka Gakkai Zasshi. 2002; 106: 304-311

[9] Wallace ZS, Khosroshahi A, Jakobiec FA, Deshpande V, Hatton MP, Ritter J, Ferry JA, Stone JH. IgG4-related systemic disease as a cause of "idiopathic"orbital inflammation, including orbital myositis and trigeminal nerve involvement. Surv Ophthalmol 2012; 57: 26-33

[10] Lee MS, Lessell S. Orbital myositis posing as cluster headache. Arch Neurol 2002; 59: 635-636

[11] Shambal S, Lindner A, Zierz S. Successful treatment of orbital myositis with intravenous immunoglobulins. Muscle Nerve 1998; 21: 1359-60

[12] Hatton MP, Rubin PAD, Foster CS. Successful treatment of idiopathic orbital inflammation with mycophenolate mofetil. Am J Ophthalmol 2005; 140: 916-918