CASE REPORT

Bilateral inflammatory pseudotumour of the trigeminal nerve: a diagnostic challenge

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Inflammatory pseudotumour (IPT) is an uncommon disease with undefined pathogenesis. It is often characterized by local aggressiveness with compressive and displacing effects on surrounding structures. It may appear in different regions of the body, rarely involving perineural structures unilaterally. We present a case of a bilateral IPT around trigeminal branches in a patient with a long-term history of periorbital swelling and proptosis.

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Case report

A 42-year-old man presented with a long-term history of bilateral painless periorbital swelling and proptosis, mainly in the left side. The values of thyroid hormones were in the normal range and thyroid antibodies were negative.

CT and MRI revealed bilateral, space-occupying masses in both orbits encasing optic nerves (Figure 1), especially on the left side. There was extension along the infraorbital nerves to the pterygopalatine fossa bilaterally (Figure 1d,e) and to the right cavernous sinus and Meckel's cave. Evidence of bilateral bone remodelling was present in the pterygopalatine fossa and infraorbital canal, mainly on the left side (Figures 1f, 2a–d).

The mass was hypointense on T_2 weighted images (Figure 1a,b) and showed a mild contrast enhancement (Figure 1c,d).

The patient underwent left Caldwell–Luc intervention with removal of part of the pathological tissue in the left supraorbital region. Histopathological evaluation showed inflammation sustained by polyclonal B and T (75% cluster of differentiation 4) lymphocytes and eosinophils with signs of bilateral perineuritis and chronic sinusitis (Figure 1e,f).

The patient refused surgery or radiotherapy.

Discussion

Inflammatory pseudotumour (IPT) is a rare idiopathic condition which can occur in nearly every site of the body, although it most commonly involves the lung, the liver and the orbit and is the third most common primary orbital tumour.^{1–3}

IPTs may represent a diagnostic challenge because of their tumour-emulating radiological and clinical behaviour.³ To our knowledge, only a few cases of IPT originating from cranial nerves have been reported, but none with bilateral involvement have been described until now.^{4,5}

Even if the aetiology remains obscure, IPT may arise after trigger events such as traumas, infections or drug abuse that lead to a common response pathologically dominated by inflammatory cells (like lymphocytes and plasma cells), histiocytes and spindle cells, and a mixture of fibroblasts and myofibroblasts.⁶

The detection of Epstein–Barr virus (EBV) antigens on immunohistochemical staining validates the hypothesis of an autoimmune post-infective reaction also sustained by corticosteroids responsiveness, even if laboratory test results for autoimmune disorders appear normal.⁵

IPT is not a static condition but dynamically changes over time, assuming two main aspects that are associated with different prognoses. The acute form consists of a polymorphonuclear leucocyte infiltration that progressively leads to lymphocytes and fibrotic cell

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Figure 1 Bilateral pseudotumour: MRI with T_2 fat-saturation (a,b) showing bilateral space-occupying masses in both orbits encasing optic nerves (a, arrows) and involving pterygopalatine fossa bilaterally especially on the left side (b, arrows). T_1 fat-saturated MRI images after gadolinium demonstrate mild contrast enhancement of the same masses (c,d, arrows). There is extension along infraorbital nerves to pterygopalatine fossa bilaterally (d,e). Bone remodelling in the infraorbital canal is shown on both MR and CT images bilaterally (e,f, arrows). Immunohistochemical evaluation shows inflammation sustained by polyclonal T (g) and B lymphocytes (h)

infiltration in the chronic stage. In this last phase IPT is usually steroid resistant and the patient has to undergo radiation or surgical treatment.

Differential diagnosis from other pathologies can be an issue because of the absence of distinctive radiological and clinical features of IPTs and because of their heterogeneous clinical behaviour.⁷

A space-occupying IPT's behaviour may lead to the diagnosis of malignant tumours such as carcinomas or

lymphomas, especially if bone erosion and infiltration signs or symptoms are present. In this case, T_2 isohypointensity and mild contrast enhancement on MR images suggest the correct diagnosis confirmed by histological evaluation.

A series of inflammatory and autoimmune clinical conditions such as sarcoidosis, Wegener granulomatosis and Sjögren's syndrome have to be considered in the differential diagnosis, especially in bilateral IPTs. The

Figure 2 Bone remodelling: sagittal CT scans show effects of bone remodelling in the pterygopalatine fossa (a, arrow) and infraorbital canal (c, arrow) of the left side. The same structures are shown on the axial plane (b, arrows). Three-dimensional CT reconstruction shows enlargement of the infraorbital foramen of the left side (d, arrow)

absence of systemic or specific symptoms, especially for sarcoidosis and Sjögren's syndrome, and of autoantibodies or respiratory and renal tract lesions typical of Wegener granulomatosis, may help physicians to avoid a wrong diagnosis.^{8–11}

Recently, several studies have reported a relationship between IPTs and the IgG4-related sclerosing disease (IgG4-RSD), a systemic condition characterized by IgG4-positive plasma cells and T lymphocyte infiltration.^{12,13} Katsura *et al*¹⁴ reported a case of an IgG4-related trigeminal IPT without any other localizations, confirming the association of the two pathological conditions.¹⁵ The preponderance of T-helper 2 lymphocytes and regulatory cytokines in tissues affected by IgG4-RSD suggests a possible allergic mechanism in the pathogenesis of the disorder, thus providing an additional possible immunological response in the pathogenesis of IPTs.¹⁶

Even if both IPT and IgG4-RSD are benign conditions that respond to corticosteroids, relapses may occur and in some cases a malignant transformation has been observed.^{15–19}

IPTs originating from both cranial and peripheral nerves have been described in the literature but, to the best of our knowledge, only unilateral trigeminal IPTs have been reported.^{4,5,20–22} To our knowledge, this is the first case of bilateral perineural IPT of the first and second branches of the trigeminal nerve. Chronic sinusitis, which was observed in our patient, might act as a trigger for perineural involvement and the generation of IPT.

In conclusion, all these evidences support the hypothesis that IPTs, IgG4-RSD and inflammatory myofibroblastic tumours may be part of a spectrum of disorders which can differ from each other in their localization and severity, but are all characterized by a deregulation of the immune response.

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