Inflammatory demyelinating pseudotumor

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ABSTRACT

Inflammatory demyelinating pseudotumor (IDP) is a rare inflammatory lesion of unknown etiology, which presents as a space-occupying lesion but responds dramatically to steroid therapy. The objective of this report is to document 2 cases of IDP seen in Kuwait. Two female patients, aged 35 and 27 years presented with the clinical and radiological features of a space-occupying lesion. Radiological investigations showed partial ring-enhancing lesions with insignificant mass effect, which were multiple in patient one, and single in patient 2. Biopsies in each patient showed features of a demyelinating disorder. Both patients remarkably improved clinically on steroid therapy. The report highlights the need for an early and correct diagnosis of IDP for therapeutic purposes.

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Inflammatory demyelinating pseudotumor (IDP) is an uncommon inflammatory lesion of the central nervous system (CNS) that clinically and radiologically mimics a neoplasm, but dramatically responds to steroids.[1] While its etiology is unknown, its relationship with multiple sclerosis (MS) remains controversial.[1] Both factors are probably contributory to the plethora of names under which it has been reported in the literature.[2,3] Despite its rarity, awareness of this entity is mandatory, as a delayed diagnosis or misdiagnosis may deny the patient the full benefit of a complete recovery or result in unnecessary aggressive management causing deleterious effect.[4] The objective of this report is to document 2 cases of IDP histologically confirmed by the Department of Pathology, Al-Sabah Hospital, Kuwait, between 1994 and 2004. During this period, the department examined virtually all CNS biopsies carried out in Kuwait.

Case Reports. ***Patient 1.*** A 35-year old female with unremarkable previous medical history presented to a neurologist, in Ibn Sina Hospital, with a 2-week history of inability to walk. Neurological examination revealed a left upper motor neuron facial weakness, right lower limb weakness with spasticity, circumventing gait, right foot drop, and brisk reflexes. Sensation was intact. There were no cerebellar signs. Both CT scan and MRI showed 2 incomplete ring enhancing lesions (**Figure 1**). The larger was in the right pre-motor area and compressed the motor strip. The smaller involved the left paracentral area. The mass effect was disproportionate to the lesion size. The differential diagnosis included secondary neoplasm and infection. Chest x-ray, bone scan, and mammography were normal. Abdominal ultrasonography was essentially normal except for a mild hepato-splenomegaly. Mantoux test was reported as positive. The patient was initially placed on anti-tuberculous therapy. Right frontal craniotomy and biopsy were carried out because of non-response to therapy. A pathological diagnosis of IDP was made, and she was started on intra-venous dexamethasone 5mg every 6 hours. This was later changed to

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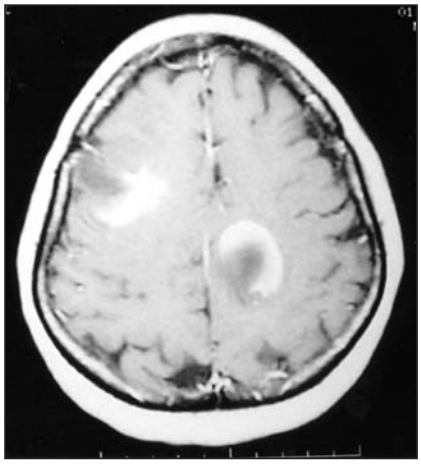

Figure 1 - Magnetic resonance image of patient one, showing irregularly enhancing lesions in the right premotor area, and left paracentral area on post contrast T1-weighted image.

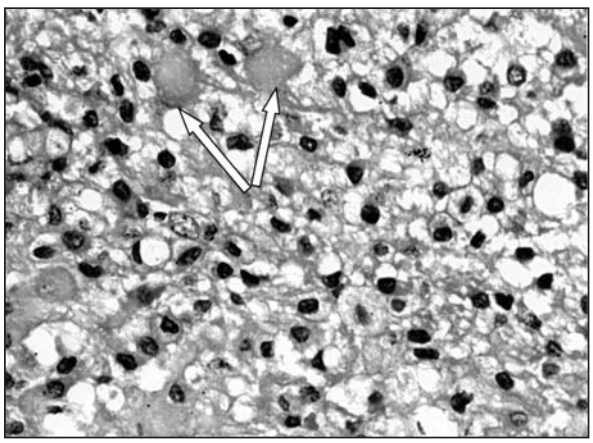

Figure 2 - Macrophages and gemistocytes (arrow).

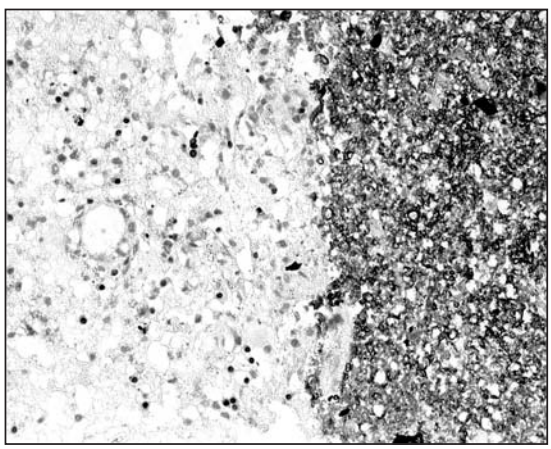

Figure 3 - Luxol fast blue stain showing sharply demarcated pale area of demyelination on the left.

prednisolone. The postoperative course was complicated by septicemia and deep vein thrombosis. The former was managed with vancomycin, while the latter was initially treated with heparin and later aspirin. She was discharged home with normal CT and MRI findings and no neurological deficit. She was lost to long-term follow-up.

Patient 2. A 27-year old female was transferred to the Emergency Ward of Ibn Sina Hospital from Mubarak District General Hospital because of generalized seizures. Before the transfer, she complained of headache for several months. Within the last month, the headache had increased in severity and was associated with vomiting, dizziness, blurred vision, and right-sided weakness. On admission, she was alert, had right hemiparesis, bilateral papilledema, right homonymous hemianopia, and right plantar reflex. Both CT and MRI revealed left parietal incomplete ring enhancing lesion. Left parietal craniotomy was carried out. At surgery, a 5 x 4 cm cystic lesion found in the parietal lobe was biopsied. A pathological diagnosis of IDP was made. She responded well to steroid therapy. At discharge, the right-sided weakness had remarkably improved, and follow-up CT showed a marked decrease in lesion size. She was discharged home in good condition and referred to the Physical Medicine Hospital for further management. She was lost to long-term follow-up.

Pathology. Intra-operative frozen section was carried out in both cases. In patient one, a diagnosis of an inflammatory demyelinating disorder was made. In patient 2, a low-grade glioma was initially reported, but this was changed to IDP on paraffin sections. The permanent sections in both cases showed sharply demarcated hypercellular lesions composed of macrophages with vacuolated or finely granular cytoplasm (**Figure 2**), hypertrophic astrocytes and gemistocytes. Creutzfeldt astrocytes, characterized by the presence of multiple small nuclei surrounded by abundant eosinophilic cytoplasm, granular mitoses, which are astrocytes in mitosis with eosinophilic cytoplasm containing minute punctuate chromatin bodies and perivascular, predominantly T lymphocytic infiltrate were focally present. Luxol Fast Blue (**Figure 3**) and myelin basic protein stains revealed sharply demarcated foci of demyelination containing neurofilament positive axons. The macrophages were diffusely positive for CD 68, while the reactive astrocytes were positive for glial fibrillary acidic protein. Viral inclusions were not identified. A diagnosis of IDP was made in each case.

Discussion. The 2 patients described in this report represent the only cases of IDP seen in Kuwait over a 10-year period. This indicates that IDP is

rare in Kuwait. Furthermore, the report highlights the diagnostic problems associated with IDP and the need for a high index of suspicion. The first patient was initially treated as tuberculosis because of the positive Mantoux report. Secondly, a frozen section diagnosis of low-grade astrocytoma was made in patient 2 because of the marked astrocytic proliferation and apparent absence of macrophages. It is probable that the biopsy was from the margin of the lesion, as the subsequent biopsy for paraffin section had numerous macrophages. In addition to the macrophages, Creutzfeldt astrocytes and granular mitoses are helpful diagnostic histological features, and special stains including immunohistochemistry should be used in suspicious or uncertain cases.[5]

Radiologically, both cases showed an incomplete ring enhancing lesion with mild mass effect. The relative lack of mass effect or vasogenic edema, given the size of the lesions is often a clue to the diagnosis of demyelinating lesions.[6] An open ring (C-shaped) sign of contrast enhancement has been described as a helpful feature in recognizing demyelinating lesions.[7] The MR spectroscopic findings of reduced N acetyl aspartate (NAA) without corresponding elevation of choline peak relative to creatine peak has been considered as a reliable diagnostic feature, which might obviate the need for stereotaxic biopsy.[6,8]

The relationship between IDP and MS remains unclear. Some authors regard IDP as a variant of MS, or an intermediate entity between MS and acute disseminated encephalomyelitis.[2] Tumefactive demyelinating lesions have been documented in patients with MS.[9-12] Similarly, some patients who initially presented with tumefactive lesions have for some unknown reasons later developed MS.[1,2] Predictive factors for such progression have not been elicited. The present report cannot contribute to this discourse as both patients were lost to follow up.

Both patients in this report are young females. A literature review indicates that IDP can occur at any age and has a slight female predilection.[2,13] An IDP may be solitary, as in patient 2, or multiple as in patient 1. Unlike MS, multiple lesions of IDP tend to be apparently of the same age. Consistent with other reports there was a dramatic response to steroids in both cases.

This report highlights the need for greater awareness of IDP among clinicians, radiologists, and pathologists despite its rarity in Kuwait. An early diagnosis will be highly beneficial to the patient because of its good response to steroids.

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