Case Report

Intracranial granuloma mimicking a brain tumor in a patient with scleroderma

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Abstract

Background: Intracranial granulomatous masses presenting as space occupying lesions, although rare, have been described in the literature. Causes include infections, systemic granulomatous disorders, and iatrogenic from previous surgery. We present a case demonstrating that spontaneous intracranial granuloma can exist, often mimicking a brain tumor.

Case Description: A 62-year-old female presented with a short history of left sided partial seizures and a left hemiparesis. Magnetic resonance imaging revealed a right sided parafalcine lesion. Histopathology demonstrated chronic inflammation of granulomatous type. She responded to steroid treatment.

Conclusion: She responded to steroid treatment. Our case demonstrated that spontaneous intracranial granuloma exists. Although rare, it should be considered in patients presenting with space occupying lesions. They can successfully be managed with steroid treatment.

Key Words: Granuloma, intracranial, scleroderma

INTRODUCTION

Intracranial granulomas presenting as space occupying lesions and can cause focal neurology and imaging may mimic that of tumor.

CASE REPORT

A 62-year-old female presented with a 3 month history of partial seizures, affecting the left arm and neck, lasting 2-3 minutes at a time. She also complained initially of some left arm clumsiness and weakness, which had progressed to include left leg weakness. Neurological examination revealed a left sided hemiparesis. She had significant past medical history, which included scleroderma, interstitial lung disease, pulmonary hypertension, and renal impairment. She was taking the immunosuppressant mycophenolate for interstitial lung disease. Magnetic resonance imaging [Figure 1a] revealed a solitary 27 × 22 mm enhancing right parafalcine lesion with surrounding edema and mass effect causing compression of the right lateral ventricle. The differential diagnosis included a dural-based metastasis or parafalcine meningioma. Due to her respiratory disease she was not fit enough for craniotomy and resection under general anesthesia and thus underwent an awake stereotactic biopsy of the lesion.

Histopathological examination of the stereotactic biopsies [Figure 1d] showed white matter with diffuse
foamy- or rod-shaped cells forming an occasional cluster, a few scattered bizarre gemistocytic astrocytes, and round cells. There were clusters and loose aggregate of round cells within loose fibrillary tissue. A few larger epithelioid cells and bizarre fibrillary cells were present. Necrosis was present and occasional plasma cells were found. There was no evidence of microorganisms and fungi on special stains (Periodic acid-Schiff Gram, Grocott, and Ziehl Neelsen stain). Immunohistochemistry showed a diffuse population of CD68-positive macrophages and histiocytes forming focal dense clusters and aggregate [Figure 1e]. These were surrounded by a dense population of CD3-positive T-cells [Figure 1f]. An occasional CD79a-positive B-cell was found. The appearances were consistent with a chronic inflammation of granulomatous type.

She completed a 3-week course of dexamethasone, 2 mg twice a day, and the hemiparesis resolved completely. Her initial seizures were managed with levetiracetam 500 mg twice a day. Follow-up imaging at 2 months [Figure 1b] revealed a decrease in the size of the lesion, and by 8 months the lesion had completely resolved [Figure 1c].

**DISCUSSION**

We report a case of spontaneous intracranial granuloma mimicking a tumor, with no precipitant that resolved with dexamethasone, which we believe to be of de novo occurrence. This is the first reported case of a spontaneous intracranial granulomatous lesion.

Parafalcine lesions pose challenges when establishing a diagnosis. Dural-based metastases or meningioma are the main extra-axial tumors to consider. Mumert, et al.\(^8\) described two cases to highlight this issue where the initial diagnosis based on radiological findings was eventually proved wrong. The importance of histological diagnosis before treatment is advocated.\(^8\)

Intracranial granulomatous lesions of iatrogenic cause have been documented in the literature. There is a varied time course to presentation from months to years. Signs and symptoms relate to anatomical location as well as speed of growth. Dural tent sutures,\(^10\) cotton fibers,\(^11\) and muslin\(^5\) have all been implicated. Commonly no specific man-made tissue is found.\(^4,6\) Korosue, et al.\(^7\) and Ono, et al.\(^9\) describe granuloma formation as a complication of in-situ subdural peritoneal shunts in pediatric neurosurgery patients.

Intracranial granuloma space occupying lesions, in the context of systemic granulomatous disease can also manifest as either a first presentation or extension or evolution of preexisting extra-cranial disease. Sarcoid is the most common and lesions demonstrate classical noncaseating histology. Lesions vary in ‘severity’, from simple sarcoid to a necrotizing type, which can be differentiated histologically.\(^13\) Wegener’s granulomatosis may present uncommonly with central nervous system involvement.\(^12\) Azuma, et al.\(^1\) describe a patient with Wegener’s presenting with an occipital lobe lesion that responded to corticosteroid therapy.

Intracranial granuloma can manifests as a response to infection. Tuberculosis is the most common cause and central nervous system involvement includes tuberculous meningitis, abscesses or discrete tuberculomas, either multiple or solitary.\(^2\) Fungal lesions are also a well-documented cause – Aspergillus being the most common organism. A multi-centre retrospective study and literature review by Dubey, et al.\(^1\) highlights that a high index of suspicion should be had by clinicians in the diabetic and immunocompromised patient groups. There is a high mortality in this group and earlier antifungal treatment is advised.

**CONCLUSION**

Parafalcine lesions pose a diagnostic challenge based on imaging alone. In patients taking immunosuppressants, nontumor alternatives should be considered. Spontaneous intracranial granuloma exists and should be considered in
the patient who presents with a space occupying lesion and who does not demonstrate infection, extracranial granulomatous disease, or has undergone a previous neurosurgical procedure.

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