

Immunoglobulin G4-Related Disease Masquerading an Epidural Spinal Cord Tumor

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Abstract

Keywords

- ▶ immunoglobulin G4
- ▶ paraplegia
- ▶ spinal cord compression

Background Immunoglobulin G4-related disease (IgG4-RD) is a recently identified multisystemic fibroinflammatory condition of unclear etiology. IgG4-RD of the epidural tissue causing spinal cord compression is extremely rare.

Case description Here, we present a 27-year-old male with epidural mass, causing spinal cord compression at the level of D5-D6. The mass proved pathologically to be epidural inflammatory pseudotumor (IPT) related to IgG4. Spinal decompression was done. The patient was started on steroid treatment and reported a complete resolution of his symptoms over a 3 years' follow-up period.

Conclusion To the authors' knowledge, this is the first case of IgG4-related epidural IPT and spinal cord compression in Bahrain and the Middle East. IgG4-RD should always be considered as a part of the differential diagnosis of spinal tumors.

Introduction

Immunoglobulin G4-related disease (IgG4-RD) is a recently identified multisystemic fibroinflammatory condition of unclear etiology.^{1,2} It usually involves the pancreas, hepatobiliary tract, lungs, salivary gland, orbit, and lymph nodes.¹⁻⁴ Spinal epidural tissue involvement is extremely rare.^{1,3-6} This report aims to present a rare case occurrence of IgG4-related epidural inflammatory pseudotumor (IPT), causing compression on the spinal cord in a young male with a relevant literature review.

Case Description

A 27-year-old male with an 8-day history of back pain and progressive numbness and weakness in both lower

limbs was admitted without any previous traumatic spinal injury. The patient denied fever or fecal and urine incontinence. The vital signs were normal, and the patient was fully awake. Neurological evaluation revealed paraparesis (Grade ⅔ Medical Research Council) and bilateral leg hypoaesthesia. Bilaterally, there was an acceleration of knee and ankle reflexes and positive Babinski signs.

All laboratory investigations were within normal limits, as were the findings on chest radiography. Cervicothoracic magnetic resonance imaging (MRI) demonstrated a posterior, expansile, epidural mass from D5 to D6, causing spinal cord compression. The mass displayed isointensity in the T1-weighted sequence (▶**Fig. 1A**), heterogeneous hyperintensity in the T2-weighted sequence (▶**Fig. 1B**), and homogenous enhancement in postcontrast T1-weighted sequence (▶**Fig. 1C**). No bone marrow abnormality in the vertebrae,

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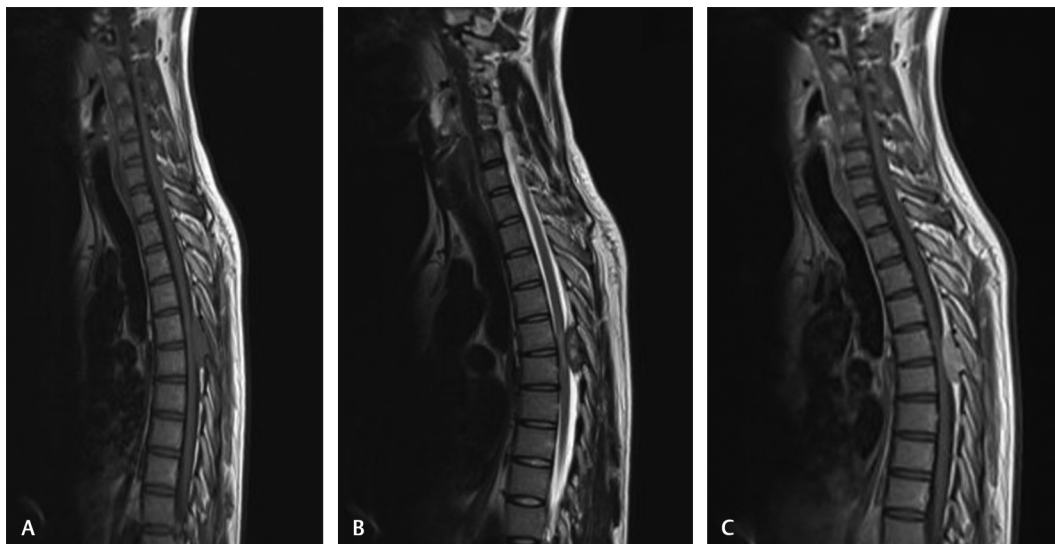


Fig. 1 Cervicothoracic magnetic resonance imaging demonstrates an expansile epidural mass from D5 to D6. The mass shows isointensity on the sagittal T1-weighted image sequence (A), heterogeneous hyperintensity on the sagittal T2-weighted sequence (B), and homogenous enhancement in the postcontrast T1-weighted image (C) with spinal cord compression.

adjacent bony destruction, or bony sclerosis was seen on MRI. The whole-body positron emission tomography scan revealed no signs of malignancy or abnormality in the spleen, liver, pancreas, adrenal, or salivary glands. The differential diagnosis entertained was spinal epidural tumors, such as lymphoma, plasmacytoma, or metastases.

The patient underwent a decompressive laminectomy of the D5–D6 vertebrae with excision of the compressive mass lesion. The mass was hard, grayish-white, located inside the epidural space below the ligamentum flavum, and attached to the thecal sac at its midlevel. After removing the mass, we sutured the dural defect using a fascial flap. A diagnosis of epidural IPT related to IgG4 was obtained by histopathology (►Fig. 2). The resected mass revealed abundant lymphoplasmacytic infiltrates and radiating collagen fibrosis with no evidence of neoplastic cells. The results of mycobacterial and fungal staining and cultures were all negative. The lymphoma panel was negative. Several IgG4 positive plasma cells, greater than 50/high power field, IgG4+/IgG+ plasma cell percentage >50%, were found in the IgG4 immunohistochemistry analysis. Elastic staining revealed obliterative phlebitis. The patient's serum IgG4 level (0.70 g/L) was within normal limits. The patient was started on steroid treatment and reported a complete resolution of his symptoms over a 3 years' follow-up period.

Discussion

IgG4-RD is a rare, potentially underdiagnosed cause of pseudotumor-like lesions.¹⁻⁶ The condition is defined by fibrosis induced by IgG4+ plasma cells, which may ultimately contribute to end-organ failure.² IgG4-RD manifests predominantly in the pituitary gland, brain parenchyma, meninges,

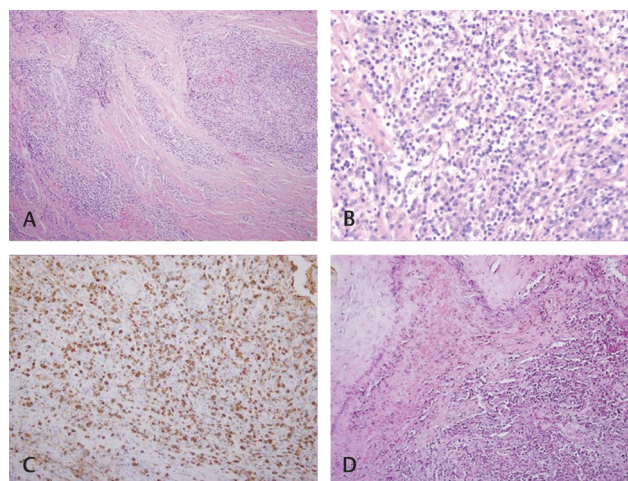


Fig. 2 The epidural mass histopathology. Fibrocollagenous tissue with inflammatory nodules infiltrates rich in plasma cells, lymphocytes, and several histiocytes, hematoxylin and eosin, 10X, and 40x (A, B). Immunohistochemistry of immunoglobulin G4+ (IgG4+) plasma cells with a gross cellularity of more than 50/high-power field and an IgG4/IgG ratio of more than 50% (C). Obliterative phlebitis is seen on elastic stain 20X (D).

peripheral nerves, and rarely less often epidural tissue in the central nervous system.²⁻⁶

IgG4-related epidural IPT may present with varied symptoms depending upon how severe the compression is and on the segment of the spinal cord affected.^{3,5} In the case discussed here, the patient stated back pain that eventually led to paraparesis and bilateral leg hyposthesia.

IgG4-related epidural IPT is often challenging to diagnose because clinical data and imaging are usually

Table 1 Characteristics of cases of IgG4-related epidural IPT causing spinal cord compression reported in the literature

Source	Age(y)/sex	Location	Bony destruction	Contrast-enhancement	Serum IgG4 (g/dL)	Management	Outcome
Ferreira et al 2016 ⁵	57/F	D10–D12	No	Well	0.662	Surgery, steroids	Improvement
Williams et al 2017 ⁴	46/F	C4–T1	No	Well	0.38	Biopsy, steroids, azathioprine	Marked improvement
Rumalla et al 2017 ¹	50/M	T5–T6	Yes	Well	Normal	Surgery, steroids	Complete resolution
Winkel et al 2018 ⁶	48/F	L2–L3	No	Well	Normal	Surgery, steroids	Complete resolution
Merza et al 2019 ³	60/F	T4–T5	No	Well	2.07	LP, surgery, steroids	Complete resolution
Our case 2020	27/M	D5–D6	No	Well	0.70	Surgery, steroids	Complete resolution

Abbreviations: IgG4, immunoglobulin G4; LP, IPT, inflammatory pseudotumor; lumbar puncture.

nonspecific. It often appears as a well-enhanced extradural mass on computed tomography or MRI that does not point to a specific diagnosis.^{1,3-6} Therefore, the diagnosis of IgG4-RD is based primarily on the pathological evaluation of the surgical specimen.¹⁻⁶ The key pathological features recognized in IgG4 lesions are lymphoplasmacytic infiltrate, storiform fibrosis, and obliterative phlebitis.¹⁻⁶ Other possible findings are an increased serum IgG4 levels, an IgG4/IgG proportion greater than 40%, and IgG4+ plasma cells infiltration of organs.¹⁻⁶ However, the sensitivity and specificity of serum IgG4 in the diagnosis of IgG4-RD are uncertain.¹

Steroid administration is the mainstay treatment for IgG4-RD and leads to a dramatic clinical response in most cases.¹⁻⁶ For patients with motor function deficits or progressive neurological symptoms, spinal decompression is usually recommended.⁶ Steroid-sparing agents have also been used in patients with recurrent or refractory disease.^{1,2}

We utilized the PubMed database to identify five cases (2000–2020) of IgG4-related epidural IPT causing spinal cord compression (► **Table 1**). Counting our case, patients averaged 48 years of age with a female predilection. Thoracic spine involvement was most common, followed by the cervicothoracic junction and lumbar spine (ratio 4:1:1). Serum IgG4 was normal in five of six cases (83.3%). All lesions showed vivid contrast enhancement on MRI. Only one lesion caused bony destruction (16.6%). Lesion biopsy, lumbar puncture for cerebrospinal fluid cytology analysis, and MRI were included as diagnostic modalities. Spinal decompression, steroid administration, and immunosuppressive therapy are among the management choices. All cases reported recorded symptomatic relief, with four cases at the final follow-up reporting complete symptoms resolution.

Conclusion

Given the rare incidence of IgG4-related epidural IPT, it is necessary to bear in mind the clinical suspicion of the disease so that the treatment can begin at the optimal timing. While steroid is the mainstay of treatment, spinal decompression may be needed to alleviate spinal cord compression.

Authors' Contributions

All authors greatly contributed to the conception, analysis, and interpretation of data. The article was critically revised by all authors for relevant intellectual content and the manuscript version to be published was finally accepted.

Conflict of Interest

None declared.

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