Case Report

Unusual imaging presentation of spinal glomus tumor: case report

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Abstract: A glomangioma, also known as a glomus tumor, is a benign lesion and had rare occurrence of spine region. In this study, we presented a spinal glomus tumor with an unusual radiological presentation, which is different from osteolytic intraosseous patterns illustrated before. A 26-year-old male with compressive myelopathy caused by epidural intraspinal lesion over T11 level. Radiological presentation revealed reactive sclerotic change over the body and lamina was found on the same level in computed tomography (CT) examination. Surgical resection was applied for *en bloc* tumor resection. The patient had well recovery after surgery. The pathology revealed cavernous haemangioma-like vascular structures, compatible with glomus tumor. Radiological diagnosis of spinal glomus tumor has limitation and difficulty preoperatively. Surgical intervention was suggested for patient with clinical neurological deficit and pathological approval.

Keywords: Glomus tumor; glomangioma; spinal myelopathy; thoracic spine; reactive sclerotic change

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Introduction

The normal glomus body is an arteriovenous anastomosis existed in the dermis layer of skin for thermoregulation (1,2). A glomangioma, also known as a glomus tumor, is a benign lesion and most located in the extremities (3). Reviewing previous publication, all of the primary spinal glomus tumors were demonstrated osteolytic patterns under radiological examination (4-9). In this study, we presented a case with spinal glomus tumor causing myelopathy and a different computed tomography (CT) imaging presentation of reactive sclerotic change.

Case presentation

History

A 26-year-old man presented with progressive paraparesis that had commenced 3 months previously. There were also paresthesia and hyperreflexia in both legs, but no bowel or bladder symptoms. Magnetic resonance images (MRIs) of the thoracic spine demonstrated an enlarged mass, causing spinal cord compression, which had the characteristics of a neuroma or a schwannoma. The tumor had iso-intensity on the T1-weighted MRI (*Figure 1A*), hyper-intensity on the T2-weighted MRI (*Figure 1B*) and a strong enhancement on the T1-weighted MRI (*Figure 1C*). There was reactive sclerotic change which was noticed on the pre-operative CT scans (*Figure 1D*). Due to progressive weakness and impaired sensation, the patient opted to undergo surgery for resection of the lesion.

Operative findings and outcomes

Under general anesthesia, the patient was under prone position with intraoperative C-arm guidance for lesion localization. During the operation, a hypervascular lesion (*Figure 2A*, marked by an asterisk) beneath the inner cortex of lamina over the same level was removed *en bloc*. Post operation, the patient's thoracic myelopathy improved greatly. The pathology report revealed some cavernous haemangioma-like vascular structures surrounded by many small clusters of glomus cells (*Figure 2B*) with

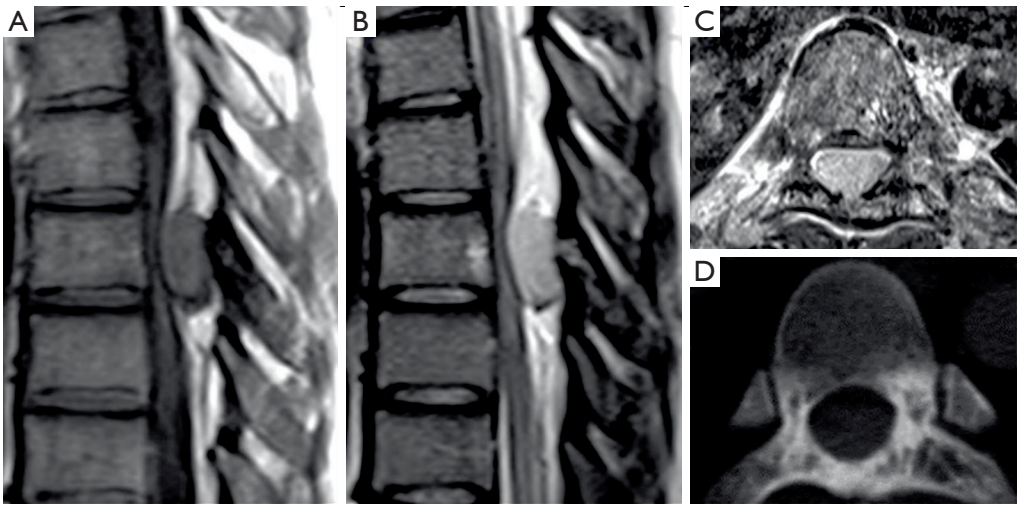

Figure 1 The pre-operative magnetic resonance image (MRI) demonstrated an enlarged mass, causing spinal cord compression, which had isointensity on the T1-weighted image (A), hyperintensity on the T2-weighted image (B) and a strong enhancement on the T1-weighted image (C). Atypical reactive sclerotic change was noticed on the pre-operative computed tomography scans (D).

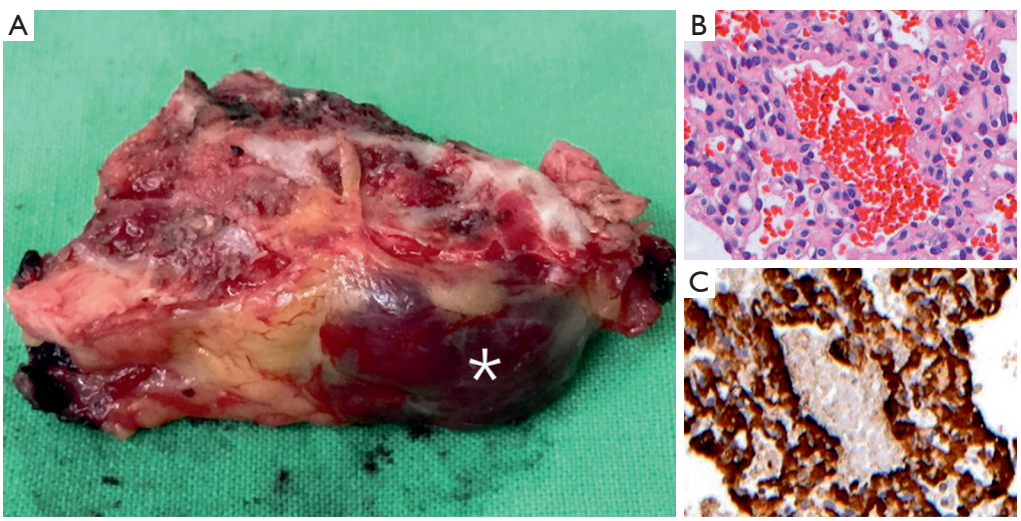

Figure 2 Surgical pathology included gross and microscopic examination of surgical specimens. Gross specimen (A) showed a hypervascular lesion (marked by an asterisk) beneath the inner cortex of lamina under microscopic examination, a proliferation of glomus cells with round monotonous nuclei, surrounded cavernous-like vessels (B) (hematoxylin and eosin stain, 200×) were also immunoreactive for smooth muscle actin (immunohistochemical staining, 100×) (C).

immunoreactive for smooth muscle actin (*Figure 2C*), and was diagnosed as glomangioma.

Discussion

Glomus tumors were most found in hands, especially fingertips (10). For glomus tumors in hands, the successful rate of surgical excision could be greater than 95% with local recurrence rate of less than 5% for 2-year follow-up (11,12). Extradigital intraosseous glomus tumors are extremely rare. There were few published literatures including the primary or metastatic spinal glomus tumor (4-9,13). In the presenting case, we demonstrated a patient with compressive myelopathy caused by an intraspinal epidural glomus tumor. Unusual reactive sclerotic change was found over body, lamina and pedicle regions. After

Table 1 Summarized cases of primary spinal glomus tumor

Cases	Lesion location	CT	MRI			Treatment
			T1	T2	Contrast	
Bessho *et al.* (4)	T2 body	Osteolytic	Np	Np	Np	T2–3 costotransversectomy
Robinson *et al.* (5)	L1 right pedicle	Osteolytic	↓	↑	Enhanced	Laminectomy with tumor resection
Payer *et al.* (6)	T4 body	Osteolytic	↑	↑	Np	T4 corpectomy
Bambakidis *et al.* (7)	L3 body; L3/4 epidural space and neural foramen; abdominal cavity	Np[†]	Np	Np	Enhanced	Posterior decompression; angiographic embolization; transthoracic resection; circumferential fixation
Becce *et al.* (8)	T11 right pedicle	Osteolytic	↓	↑	Enhanced	Percutaneous CT-guided radiofrequency ablation
Liu *et al.* (9)	T2–T4 vertebral body with epidural space and neural foramen; chest cavity	Osteolytic	↑	Iso	Np	Angiographic embolization; posterior lateral decompression with circumferential fixation
Current case	T7 epidural space	Reactive change	Iso	↑	Enhanced	T7 total laminectomy

[†], no image provided, but bony erosion found during surgery was mentioned in the article; ↓, hypointensity; ↑, hyperintensity. Iso, isointensity; Np, not provided; CT, computed tomography; MRI, magnetic resonance image.

surgical *en bloc* resection, the patient had well recovery under uneventful follow-up.

For imaging presentation, Lee *et al.* (2) reviewed the 11 cases with extradigital glomus tumors over extremity, buttock and scapula regions. Under MRI examination, these lesions were ovoid and well defined, and were illustrated hypointensity or isointensity on T1- and hyperintensity on T2-weighted MRI images. Compared with the intraosseous glomus tumors, there were seven cases (including our presenting case) with the primary spinal lesions. Except some cases without providing MRI information, most of cases were illustrated hyperintensity or isointensity on T2-weighted images, but the presentation of T1-weighted image was not consistent (*Table1*).

Under the CT examination, six cases with the primary glomus tumor were published before. Five of them revealed osteolytic pattern on figures illustrated. The rest of one case was also mentioned osteolytic finding during surgery. In our presenting case, there was no osteolytic lesion, but reactive sclerotic change over the body and lamina was found over the same level of the tumor located (*Table 1*). There is no evidence to explain this finding. However, Kim *et al.* reviewed 19 consecutive patients with solitary spinal bone lesions found on MRI and CT examination. Compared the final surgical pathological results with different presentations of MRI and CT examinations, the percentage of reactive sclerotic change in the benign lesions was significantly higher than that in the malignant lesion (14).

The glomus tumor was a rare spinal lesion. The previous literature was illustrated different presentation of myelopathy with or without radiculopathy (4-8). In our case, abnormal bone reaction was found on the pre-operative CT scan, unlike the osteolytic pattern of the previous cases published before (5,6,8). The radiological diagnosis was difficult pre-operatively. Surgical resection for definite pathology was suggested.

Conclusions

Preoperatively radiological diagnosis of spinal glomus tumor has limitation. For patient with spinal compressive myelopathy with neurological deficit, surgical intervention was suggested not only for relieving symptoms but confirming pathological diagnosis.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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