

# Primary Spinal Marginal Zone Lymphoma Relapse at a Different Spinal Level after Remission of the Primary Lesion

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## Abstract

**Study Design** Case report.

**Objective** Most spinal lymphomas occur in the context of systematic lymphomas. Marginal zone lymphoma (MZL) is a type of B-cell lymphoma originating from the marginal zone of B-cell follicles. Mucosa-associated lymphoid tissue (MALT) lymphoma is a type of extranodal MZL and rarely occurs in the central nervous system. To date, there has been only one case report of primary spinal MALT lymphoma and there are no case reports of relapsed MALT lymphoma at a different location of the spine.

**Results** A 58-year-old man complained of gait disturbance and urinary dysfunction. Magnetic resonance images showed an abnormal lesion in the epidural space at T11–L1 compressing the conus medullaris. The patient underwent laminectomy and partial resection of the tumor. Histopathologic and immunohistochemical findings were consistent with MALT lymphoma. Following postoperative radiotherapy, the epidural mass disappeared completely. Three years later, epidural MALT lymphoma at a different location in the thoracic spine (T8–T10) occurred and caused myelopathy again. Histologic diagnosis of the relapsed tumor was the same as had been seen 3 years previously.

**Conclusions** This is the first case report of relapsed spinal MALT lymphoma at a different location of the thoracic spine. Though the prognosis of MALT lymphoma is fairly good, careful follow-up is needed to screen any relapse or transformation to a high-grade lymphoma.

## Keywords

- ▶ spinal tumors
- ▶ epidural tumor
- ▶ spinal marginal cell lymphoma
- ▶ MALT lymphoma
- ▶ thoracic spine

## Introduction

Primary spinal epidural lymphoma is relatively rare among all lymphomas, with an incidence ranging from 0.8 to 2.8%.<sup>1–3</sup> Lymphomas were classified by the World Health Organization in 2001 into three major categories: B cell, T cell, and Hodgkin disease. Marginal zone lymphoma (MZL)

is a type of B-cell lymphoma originating from the marginal zone of B-cell follicles. There are three types of MZL: (1) splenic, (2) extranodal (mucosa-associated lymphoid tissue[MALT] lymphoma), (3.) nodal. Extranodal MZLs (MALT lymphoma) involve only organs outside of the lymphatic system, such as the thyroid, gastrointestinal tract, or skin. MALT lymphoma commonly occurs in the

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gastrointestinal tract, and its occurrence in the central nervous system (CNS) is extremely rare. Most reports of MALT lymphoma in the CNS showed that the lesions were localized at the cranial dura mater,<sup>1-5</sup> and there has been only one case report of MALT lymphoma observed in the spine up to the present.<sup>6</sup> The purpose of this report is to present the first patient who had had epidural MALT lymphoma in the thoracic spine that relapsed at a different spinal level several years after complete remission of the primary lesion.

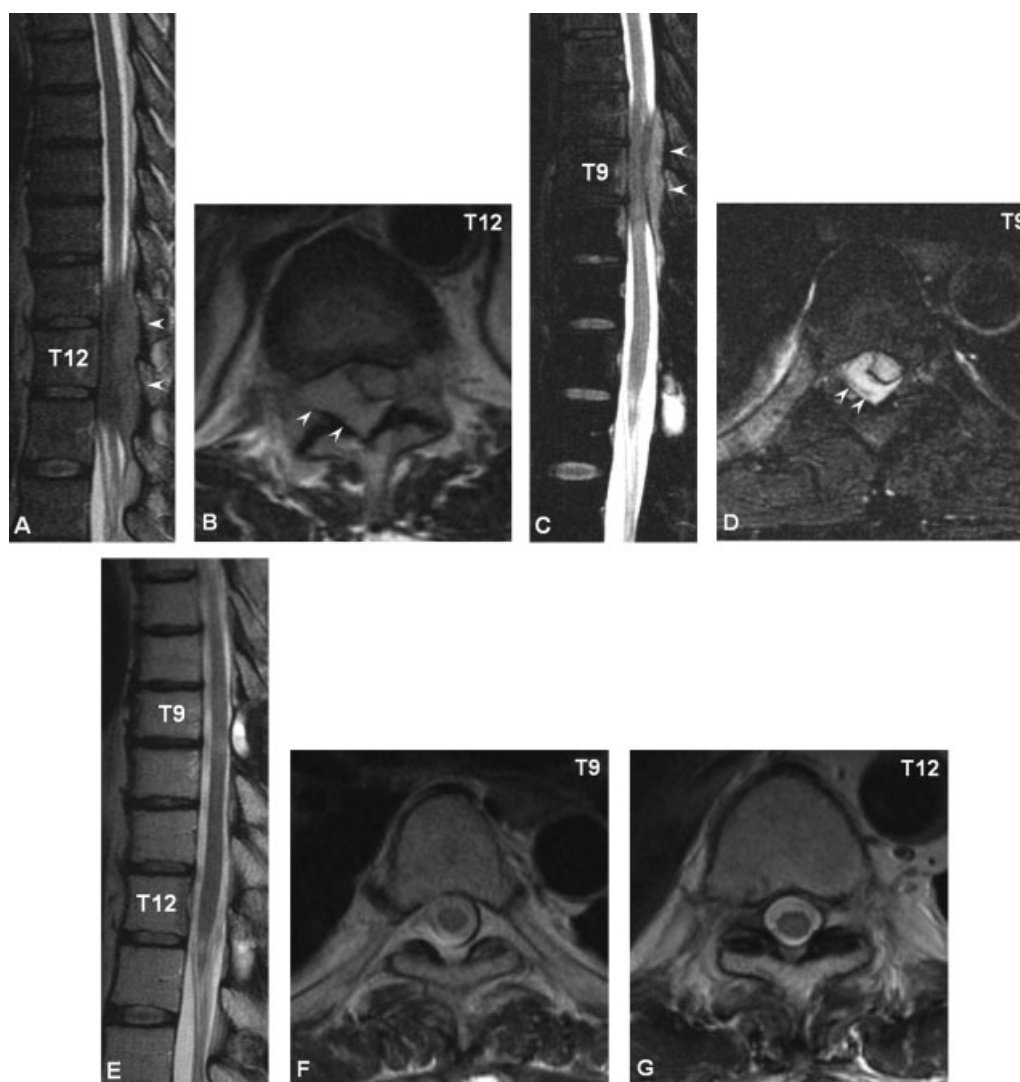
## Case Report

A 58-year-old man started to complain of bilateral anterior thigh pain. Six months later, he visited our hospital for the first time because of worsening bilateral thigh pain and occurrence

of bilateral foot drop and urinary disturbance in combination with sensory disturbance in his lower extremities and perineal area. His physical examinations at the first visit showed spastic gait, accelerated tendon reflexes in his knees and ankles, and positive pathologic reflexes, such as Babinski and Chaddock reflex, in both legs. Motor weakness was observed in both legs below hip joints with grade 4 to 5. Pain sensation in both legs was reduced to 50% of the normal level.

Magnetic resonance (MR) images showed an abnormal mass lesion in the epidural space of the thoracolumbar spine compressing the conus medullaris (**Fig. 1A, B**). On positron emission tomography (PET), mild uptake at the lower thoracic spine was the only finding.

Laboratory investigations including blood examinations and tumor markers did not show any abnormal findings. Bone marrow aspiration showed normal hematopoiesis.



**Fig. 1** T2-weighted magnetic resonance images at the initial visit (A, B), 3 years after the first therapeutic series (C, D), and at the final follow-up (E, F, G). (A) Sagittal plane. (B) Axial plane at T12 showing abnormal lesion located in the epidural space of the thoracolumbar spinal canal (T11–L1) compressing the conus medullaris (arrow). (C) Sagittal plane. (D) Axial plane at T9. The tumor at the thoracolumbar spine, which had been partially resected and irradiated in the previous treatment, showed complete disappearance. However, a relapse of the tumor is evident in the epidural space of the thoracic spinal canal from T8 to T10 (arrow). (E) Sagittal plane. (F) Axial plane at T9. (G) Axial plane at T12. There was no residual or recurrent tumor in the epidural space at the last follow-up, 51 months after the first diagnosis at T11–L1 and 15 months after the diagnosis of the second lesion at T8–10.

To achieve early decompression of the spinal cord and to make a definite pathologic diagnosis by samples from the epidural mass, surgery consisting of hemilaminectomy at T12 and removal of a grayish soft and slightly adhesive mass over the dural sac was performed. It was impossible to perform complete resection of the tumor due to its expansion into the neural foramen and thoracic cage. After surgery, his urinary dysfunction and motor weakness showed remarkable improvement.

Histopathologic analysis showed that the resected mass was composed of lymphocytic infiltrate that was mainly composed of small lymphocytes (►Fig. 2A). By immunohistochemical studies, most tumor cells were positive for CD20 and CD79a (►Fig. 2B) and negative for CD3 (►Fig. 2C), CD5, CD10, and CD138. Light chain expression was restricted to the  $\lambda$  chain. The pathology department reported that these findings were consistent with MALT lymphoma.

Radiotherapy consisting of 40 Gy/16 fractions at T10–L3 was conducted after surgery. At a month after the radiation therapy, his neurologic functions returned to normal and MR images showed complete disappearance of the mass in the spinal canal. Because the patient was free from any symptoms after the initial treatment, he did not visit our hospital for follow-up examinations.

Three years later, however, the patient revisited our hospital with gait disturbance and numbness of the bilateral legs and the perineal area.

MR images showed an abnormal lesion in the epidural space from T8 to T10, compressing the spinal cord (►Fig. 1C, D). The previous tumor at T11–L1 completely disappeared. On PET, uptake in the spinal canal at T9 was detected without any uptake at the primary lesion of T12 (►Fig. 3A, B).

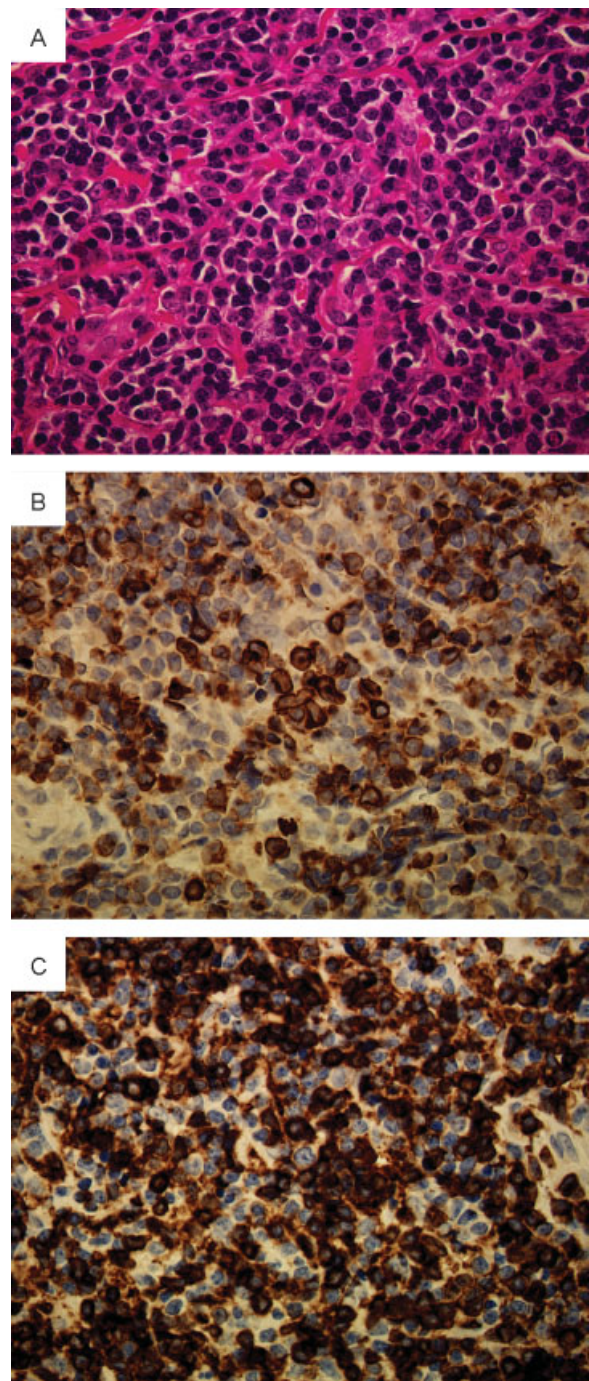
To examine histologic transformation to any higher-grade lymphoma, surgery consisting of a laminectomy at T9 and resection of the epidural tumor over the dural sac was conducted. Histopathologic analysis identified that the tumor lesion at T9 was the same as seen at T12 3 years before.

Radiotherapy consisting of 40 Gy/20 fractions started at 10 days after surgery. The patient's neurologic functions returned to normal. On MR images, there was no evidence of residual lesion or tumor recurrence in the epidural space for postoperative 2 years (►Fig. 1E, F, G). His neurologic findings were normal at the final follow-up.

## Discussion

Most cases of dural lymphoma consist of secondary dural involvement in the context of systematic or other organs' primary lymphomas. Extranodal MZL (MALT lymphoma) rarely occurs in the CNS. Thirty-seven patients with MALT lymphomas in the CNS have been reported.<sup>7</sup> In most reported patients, the lesions were localized at the cranial dura mater in the head and MALT lymphomas originating from the spine are extremely rare. To date, there is only one case report of primary spinal MALT lymphoma in the thoracic spine.<sup>6</sup>

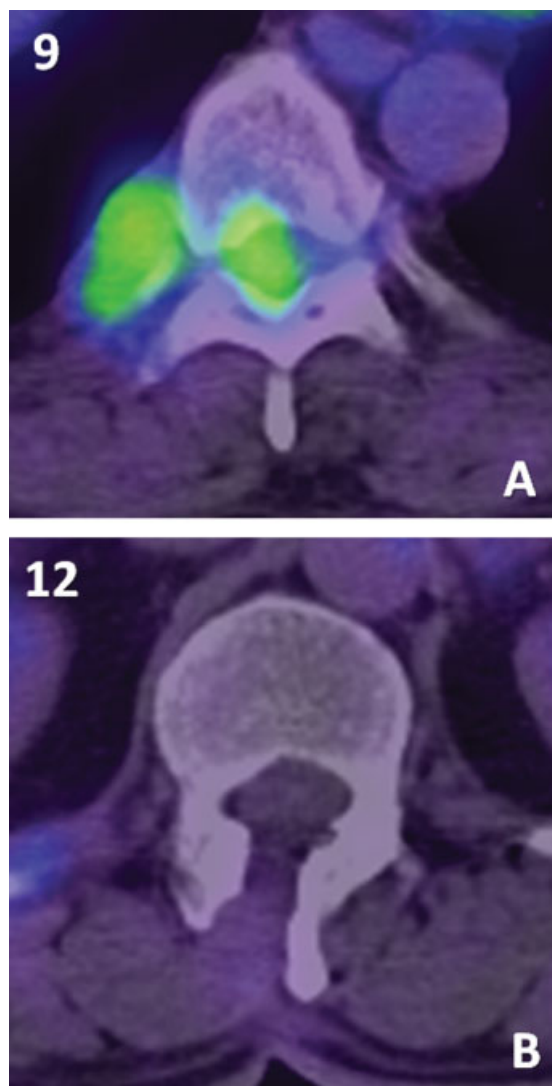
Previous articles suggest that radiotherapy is effective in controlling MALT lymphoma in the cranial dura and spine.<sup>2</sup> Because MALT lymphomas are radiosensitive, surgical total



**Fig. 2** Histopathologic analysis of the epidural mass resected in the first operation. (A) The tumor mass in the epidural space is mainly composed of small or medium-sized lymphocytes (stained with hematoxylin-eosin, original magnification  $\times 400$ ). (B) Most tumor cells with a brown color were positive for CD79a (original magnification  $\times 400$ ). (C) Lymphoma cells with a light blue color are negative for CD3 (original magnification  $\times 400$ ).

resection of the epidural tumor is not necessary and the main role of surgery is to determine its pathologic diagnosis. For patients with progressive neurologic deficits due to intracranial or spinal MALT lymphomas, however, neural decompression by surgical resection of the main tumor mass should be performed in combination with radiotherapy.<sup>5</sup> Once pathologic examinations reveal that the tumor is MALT lymphoma,





**Fig. 3** Positron-emission tomography (PET) was taken when the patient had the second episode of neurologic deterioration, 3 years after the first treatment. Though uptake in the spinal canal at T9 (A) was clearly observed, there was no uptake around T12 (B), the site of the primary lesion.

radiotherapy is the most effective and reliable treatment.<sup>6</sup> Though there have been a few reports of cases in which only chemotherapy consisting of methotrexate was administered, the scientific evidence of chemotherapy's effectiveness for MALT lymphomas is not established yet.<sup>4</sup>

Regarding the relapse of spinal epidural lymphoma, Monnard et al reported that relapses in the CNS were observed in 4 of 52 patients.<sup>3</sup> In the present patient, MALT lymphoma occurred twice in the thoracic epidural space at an interval of 3 years. There is no definite answer to the question whether the second lesion was a growth of the residual tumor of the first one or a growth of other foci of tumor above T11. Though the pathomechanisms of spinal relapse in this patient remain unclear, this is the first case report of spinal MALT lymphoma relapse at a different location of the spine at an interval of several years. According to the literature, the long-term prognosis of spinal or cranial MALT lymphoma is

generally good after the initial treatment.<sup>6</sup> It cannot be denied, however, that there are possibilities of histologic transformation from the original form to more aggressive ones.<sup>5</sup> The rate of transformation to diffuse large B-cell lymphoma is reported to be less than 10%.<sup>8</sup> Due to the fact that the first choice of therapy for diffuse large B-cell lymphoma is chemotherapy,<sup>9</sup> the sensitivity of the lymphoma cells to chemotherapy is key to the prognosis of systematic lymphoma. Therefore, it is important to investigate any transformation to more aggressive forms by histopathologic analyses when a patient with a relapse of spinal MALT lymphoma is seen. Because the histopathologic findings at the time of relapse were the same as seen 3 years earlier in the present patient, surgical decompression in combination with following radiotherapy was effective in treatment of the relapsed lesion at a different location of the spine.

The present patient showed unique consequences of MALT lymphoma at the epidural space of the spine. Radiotherapy combined with spinal decompression surgery achieved complete remission of the disease one time. However, the present case reminds us of the importance of periodic follow-up imaging studies to screen for relapses at different spinal levels. Further follow-up is needed to discern any transformation from MALT lymphoma to more aggressive forms of lymphomas.

#### Disclosures

None

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