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Two cases of low back pain of unknown etiology diagnosed as multiple myeloma

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Abstract

We report two cases of patients complaining of lumbar back pain of unknown etiology which were finally diagnosed as multiple myeloma. The first case was a woman in her 80s with a chief complaint of lumbar back pain. The second case was a male in his 70s. He also consulted our institution because his pain did not subside despite receiving increased doses of oral medication and nerve blocks from his previous doctor. Both patients presented with compression fractures on plain radiography, and additionally with cytopenia, hyperproteinemia, and hypoalbuminemia in blood tests. Further tests were conducted due to suspected multiple myeloma, revealing a punched-out legion in the skull and elevated levels of β2 microglobulin and Immunoglobulin G. Subsequently, both patients were transferred to the hematology department. In these two cases, we had predicted the presence of multiple myeloma from the results of initial testing and subsequently successfully provided definitive diagnoses following additional examinations.

Keywords

Multiple myeloma, low back pain, IgG, hypercalcemia, β2-microglobulin, Numerical Rating Scale

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Introduction

Multiple myeloma (MM) is characterized by the accumulation of clonal, malignant plasma cells in the bone marrow and accounts for about 10% of hematological malignancies. The median age for diagnosis of MM is 65 years. The cause of MM is unknown.[1] MM can present with a wide constellation of symptoms including hypercalcemia, anemia, renal impairment, and/or bony pain.[2] Low back pain is one of the symptoms indicative of MM, which is often treated as pain of unknown etiology. The low back pain of MM is characterized by pain caused by osteolytic bone lesions.[3] Many ambulant patients visiting pain clinics have the chief complaint of low back pain, and among them are ones who require specialized treatment such as for MM. We report our experiences with two patients having lumbar back pain of unknown etiology with a final diagnosis of MM. We obtained written informed consent from the patients for the publication of this case report.

Case presentation

Case 1

A woman in her 80s had visited a local doctor with a chief complaint of lumbar back pain 3 months prior, and she had been taking loxoprofen sodium and pregabalin for a diagnosis of low back pain. However, she was subsequently introduced to our institution because the pain did not resolve. Her medical history included hypertension, surgery for sigmoid colon cancer, and knee osteoarthritis.

Lumbar back pain during movement without lower limb nerve root symptoms was recognized as a physical finding in the initial examination.

There was percussion tenderness at the lower back, and no sensory disturbance was observed. Score on the self-rating depressiveness scale (SDS) was 64 points, that for the Kessler psychological distress scale (K6) index of mental well-being was 14 points, and that for the Numerical Rating Scale (NRS) was 10/10, indicating severe pain. In the hematological tests during the initial examination, red blood cell (RBC) count of $318 \times 10^4/\mu L$, white blood cell (WBC) count of 2100/μL, hemoglobin of 9.7 g/dL, platelet count of

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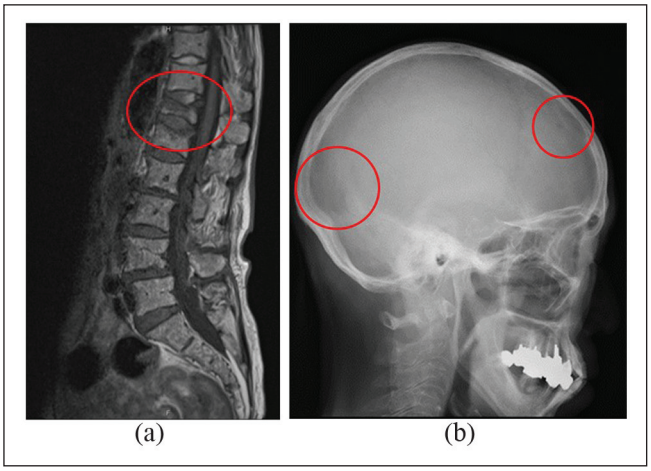

Figure 1. (a) Low T12 signal on lumbar T1-weighted MRI (red circle) and (b) punched-out lesion in the skull on a cranial radiograph were observed (red circles).
MRI: magnetic resonance imaging.

$15.9 \times 10^4/\mu L$, total protein of 10.3 g/dL, a low level of hemoglobin, and relatively high level of total protein were observed. Hepatic and renal function were normal. Lumbar radiographs showed a compression fracture in T12. The anemia and hyperproteinemia in the hematological test results and lumbar compression fracture observed on radiography led us to suspect MM, and additional tests for albumin, immunoglobulin, and β2-microglobulin were subsequently performed. The additional hematological tests revealed a low albumin level (3.0 g/dL), a high immunoglobulin G (IgG) level (5363 mg/dL), and a high β2-microglobulin level (2.67 mg/dL). Low signal intensity at T12 on lumbar T1-weighted magnetic resonance imaging (MRI) and a punched-out lesion in the skull on a cranial radiograph were observed (Figure 1). Based on these results, a diagnosis of MM was made, and the patient was then transferred to and treated in the hematology department.

Case 2

A male patient in his 70s experienced worsening lumbar back pain in the 3 months preceding his visit to our institution and was prescribed oral medications (loxoprofen sodium, pregabalin, diclofenac sodium, and buprenorphine) by a local physician. Despite this he saw no improvement in the pain and developed difficulty walking and was subsequently introduced to our institution. His medical history included total gastrectomy for gastric cancer, atrial fibrillation, lumbar disc herniation, and knee osteoarthritis. Pain during movement of the lumbar back without lower limb nerve root symptoms was recognized as a physical finding in the initial examination. He also had difficulty maintaining a supine position due to pain. His score for the SDS was 54 points, that for the K6 was 17 points, and that for the NRS was 10/10, indicating severe pain. In hematological tests during the initial examination, an RBC count of $258 \times 10^4/\mu L$, WBC count of 4600/μL, hemoglobin of 8.2 g/dL, platelet count of $24.1 \times 10^4/\mu L$, total protein of 10.3 g/dL, a low hemoglobin level, and a relatively high total protein level were observed, as for Case 1. Hepatic and renal function were normal. Lumbar radiograph showed a compression fracture at L1. As we suspected MM, additional hematological tests were performed, and a low albumin level (2.8 g/dL), a high IgG level (6481 mg/dL), and a high β2-microglobulin level (4.13 mg/dL) were observed, again as for Case 1. In addition, low signal intensity at L1 on T1-weighted MRI and punched-out lesions in the skull radiography and in the transverse process and ilium on 3D computed tomography (CT) of the lumbopelvic region were recognized (Figure 2). Based on these results, a diagnosis of MM was made, and the patient was subsequently transferred to and treated in the hematology department.

Discussion

In these two cases, MM could be diagnosed early based on blood tests and a specialized treatment could be started early for patients who came to the pain clinic with low back pain. Low back pain is one of the most frequent chief complaints among patients in pain clinics. Causes for this are not limited to diseases of the orthopedic region in the spine, pelvis, hip joint, and so on, but also encompass a wide range of conditions such as visceral diseases.[4,5] It is also observed in diseases of the retroperitoneal organs such as in the case of ureteral stones and kidney diseases. Low back pain may also be experienced as a symptom of critical illnesses related to infection, cancer, or conditions affecting the aorta.[5,6] As MM is one candidate cause of low back pain, it is crucial not to overlook it.[7] However, early diagnosis of MM is challenging because the tumor is confined to the bone marrow in its early stage and plain radiography often does not reveal obvious abnormalities.[8] While MRI is superior in the detection of spinal lesions, it can be difficult to distinguish between MM and osteoporotic compression fractures (acute phase) because they share the common finding of hypointensity on T1-weighted images and hyperintensity on T2-weighted fat-suppressed images compared with normal bone marrow.[9] The clinical features of MM include anemia, bone pain, renal dysfunction, hypercalcemia, and high total protein level, and the present cases showed many of these features.[10] In both cases, the clinical courses were incredibly similar. Percussion pain of the back and pain during movement were observed but lower limb nerve root symptoms or sensory disturbances were not, in the physical examinations. Compression fractures were shown on imaging tests, and cytopenia, hyperproteinemia, and hypoalbuminemia were revealed in blood tests. As MM was suspected, additional examinations were conducted, and a punched-out lesion of the skull, high β2-microglobulin, and high IgG were identified as a result,

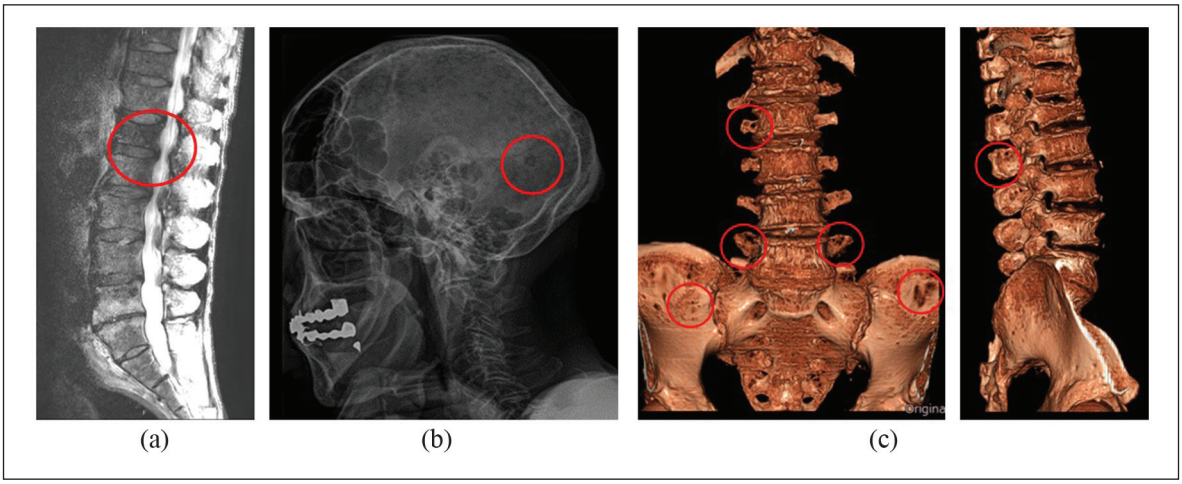

Figure 2. (a) Low L1 signal on lumbar T1-weighted MRI and (b) punched-out lesion in the skull on cranial radiograph were observed (red circles). (c) Punched-out lesions in the transverse process and ilium on 3D CT of the lumbopelvic region were also recognized (red circles).
CT: computed tomography; MRI: magnetic resonance imaging.

leading to a diagnosis of MM in both patients, and specialized treatment was started following their transfer to the hematology department. Generally, laboratory tests when MM is suspected include a complete blood count and biochemistry, as well as immunoglobulin quantitation, and detection of abnormal immunoglobulins by protein immunoelectrophoresis of serum and urine.[11,12] If plain radiography or MRI reveals benign vertebral compression fractures but relief is not achieved by treatment, or it is achieved only temporarily, it is vital that MM should be added to the differential diagnoses. To achieve an accurate diagnosis, it may be necessary to reexamine the patient with imaging studies such as plain X-rays, MRI, and CT, as well as immunoglobulin quantification, protein immunoelectrophoresis of serum and urine, and bone marrow examination. Although the present patients did not have any neurological symptoms such as numbness, peripheral neuropathy can occur in MM, and it is estimated that 20% of patients with MM present with peripheral neuropathy at the time of initial diagnosis.[13] Therefore, MM should also be considered in the differential diagnosis in patients with neurological symptoms. The two present patients had many commonalities in their medical histories and examination results, and early treatment of the primary disease was enabled by our doubts regarding the etiology of their symptoms based on the results of their initial examinations.

Conclusions

As the cause of low back pain is unknown in many cases, keeping in mind that MM may be a possible diagnosis in cases of complicating compression fractures, it is crucial for clinicians to scrutinize the examination results from the initial diagnosis and accurately differentiate it from other diseases. In this report, we described two cases wherein we were able to diagnose MM in a patient with low back pain of unknown etiology based on comprehensive scrutiny of the patient's clinical course, blood tests, and imaging examinations.

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None.

Author contributions

K.A. and Y.I. contributed to the pain management of the patient, conceptualization of the case report, and writing of the original draft. K.O. contributed to the pain management of the patient. Y.I., S.S., and K.O. edited the article. S.K. was the overall supervisor for this case. All authors read and approved the final article.

Availability of data and material

Not applicable

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Ethics approval

Our institution does not require ethical approval for reporting individual cases or case series.

Informed consent

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