ไขสันหลังถูกกดทับจากมะเร็งเม็ดเลือดชนิดมัลติเพิลมัยอีโลมา; รายงานผู้ป่วย 1 ราย และทบทวนการวินิจฉัย โดยภาพเอกซเรย์

Cord Compression Caused by Multiple Myeloma; A Case Report and Review Diagnostic Imaging

อุทิศ ตันรัตนาวงศ์ พ.บ.,
ว.ว. รังสีวิทยาทั่วไป
กลุ่มงานรังสี
โรงพยาบาลหัวหิน จังหวัดประจวบคีรีขันธ์

Uthis Tanratanawong M.D.,
Diploma, Thai Board of Radiology
Diagnostic Imaging Unit
Huahin Hospital, Prachuabkhirikhan

ABSTRACT

Spinal cord compression caused by multiple myeloma is not a common first presentation of the patients. A 65 year old man presented with progressive paraparesis. MRI images revealed tumor in T3 vertebra, which were low signal intensity curvilinear areas within the vertebra or cortical irregularity. The tumor had epidural extension and caused cord compression.

Keywords : MRI, spinal cord compression, multiple myeloma

บทคัดย่อ

ภาวะไขสันหลังถูกกดทับจากก้อนเนื้องอกพบได้ไม่บ่อย ที่เป็นสาเหตุของอาการนำที่ทำให้ผู้ป่วยมาพบแพทย์ในโรคมะเร็งเม็ดเลือดชนิดมัลติเพิลมัยอีโลมา (multiple myeloma) ผู้นิพนธ์ได้รายงานผู้ป่วยชาย อายุ 65 ปี มาด้วยอาการอ่อนแรงของขาทั้งสองข้าง การตรวจด้วยคลื่นแม่เหล็กไฟฟ้า (MRI) พบก้อนเนื้องอกที่กระดูกสันหลังระดับทรวงอกอันที่ 3 ซึ่งมีลักษณะขอบโค้งตามแนวกระดูกที่ให้สัญญาณต่ำ ที่เป็นลักษณะเฉพาะของโรค พบว่าก้อนเนื้องอกได้ขยายเข้าไปในช่องไขสันหลัง และกดทับไขสันหลัง

คำสำคัญ : ภาพเอกซเรย์คลื่นแม่เหล็กไฟฟ้า การกดทับไขสันหลัง มะเร็งเม็ดเลือดชนิดมัลติเพิลมัยอีโลมา

Introduction

Spinal masses are prevalent in medicine. These masses most often result from metastatic neoplasms, although many other etiologies are possible. They present most commonly as pain (both local and radicular), weakness, paresthesia, loss of bladder or bowel function and ataxia, which are signs of spinal cord compression. In addition to early recognition of spinal masses and compression symptoms, identifying the underlying cause is crucial because delay in treatment could have devastating consequences.

Case Report :

A 65-yea-old man has presented with progressive low back pain for 6 months. The pain did not radiate to lower extremities. Two weeks before admission, the patient developed weakness of both legs and unability to urinate, accompanied by constipation.

On physical examination, the patient was pale without jaundice or fever. His neurologic examination showed hypoesthesia below T4 level, paraparesis (grade 0 motor power), loss of anal sphincter tone and decrease of deep tendon reflexes.

Laboratory :

Hematological investigation revealed normochromic / normocytic anemia (hemoglobin 9.3 mg/dL, hematocrit 29%), white blood count 6,250 /ml (neutrophil 58%, lymphocyte 31%, monocyte 7%, eosinophil 4%), platelet count 198,000 /mL. Blood chemistry showed BUN 10 mg/dL, Cr 0.8 mg/dL

Imaging study :

MRI of whole spine was performed on a 1.5 Tesla and revealed diffusely decreased signal intensity of vertebral marrow and both iliac bones on T1-weighted and T2-weighted sequence.

There was spinal cord compression by an epidural mass at T2-T4 level that related soft tissue mass at T3 vertebra with paravertebral soft tissue mass (Figure 1, 2). The soft tissue mass occupied in T3 vertebra that appearance of low signal intensity curvilinear areas within the vertebra or cortical irregularity (Figure 4).

The spinal cord signal was low on T1 -weighted image and increase signal on T2-weighted image due to edema at the level of compression (Figure 2). The epidural mass had moderate enhancement on contrast study (Figure 3). Axial images and coronal images better delinated (Figure 4, 5). Lateral skull film also showed multiple punched-out round lesions (Figure 6).

CT abdomen and chest showed neither other mass nor enlarged lymph node. All diagnostic images were suggestive of multiple myeloma more than metastases .

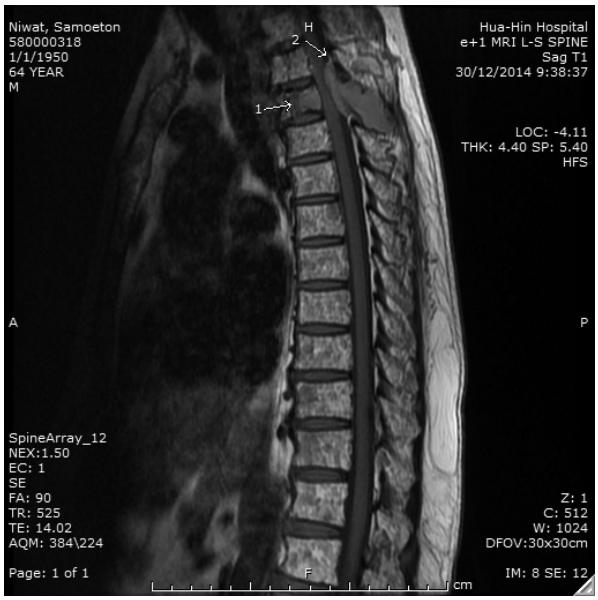

Fig. 1 Sagittal T1W showed a mass at T3 vertebra with extension into epidural space compressed spinal cord. Diffusely decreased signal intensity throughout the vertebral body was also noted.

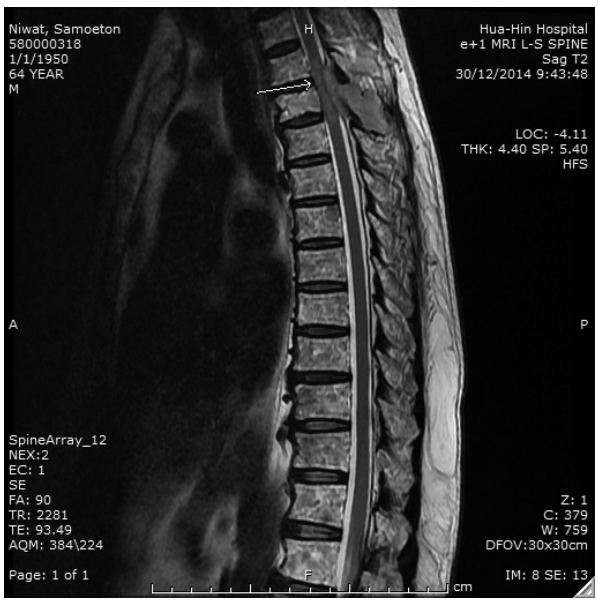

Fig. 2 Sagittal T2W showed hypersignal epidural mass at T2-T4 and also intravertebral mass at T3.

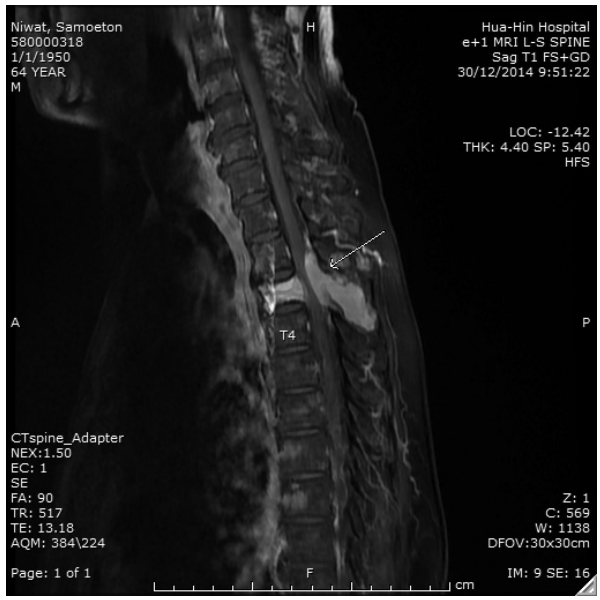

Fig. 3 Contrast -enhanced, fat-suppressed sagittal T1W showed enhancement of epidural mass and intravertebral mass at T3 level.

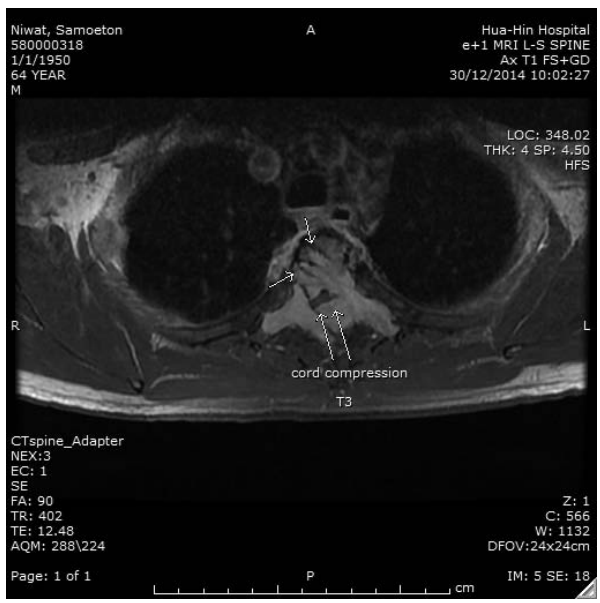

Fig. 4 Axial contrast-enhanced, fat-suppressed T1W showed low signal curvilinear within the vertebra, Epidural mass compressed spinal cord (double arrows).

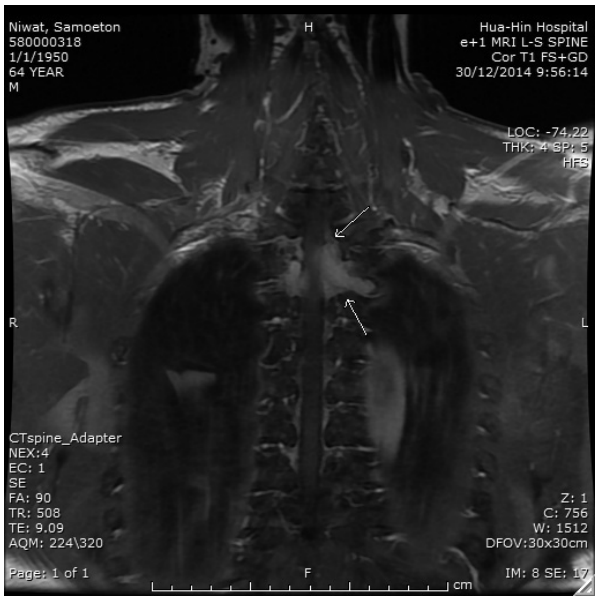

Fig. 5 Coronal contrast-enhanced, fat-suppressed T1W also showed epidural mass.

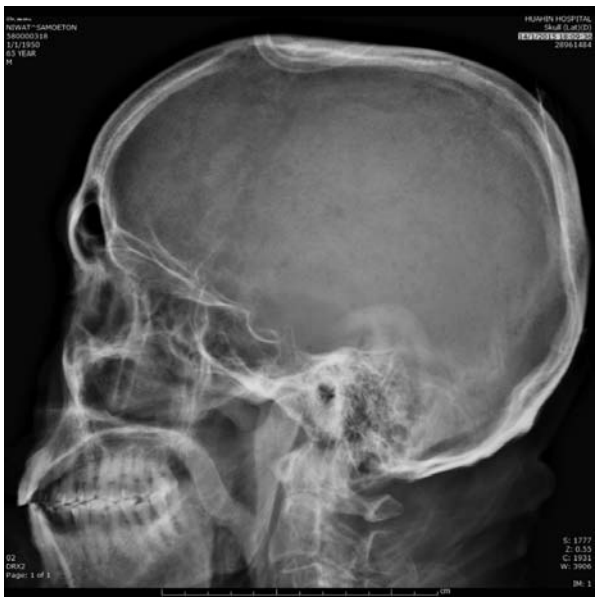

Fig. 6 Lateral skull showed multiple small punched out lesions.

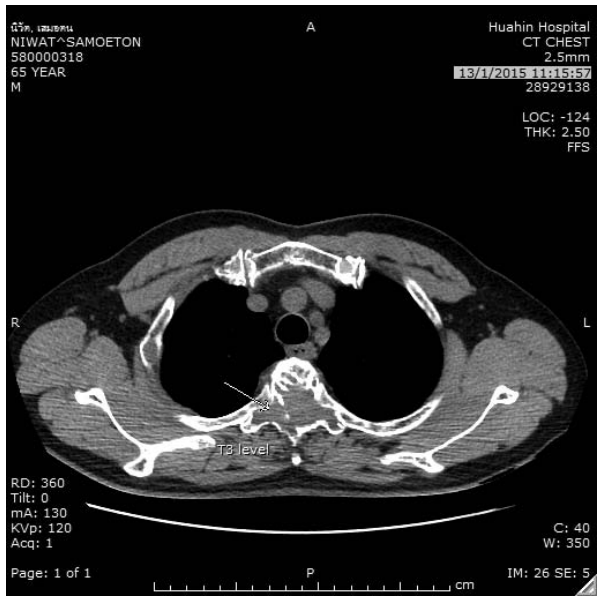

Fig. 7 Axial CT chest showed intravertebral mass extension into spinal canal with cortical irregularity.

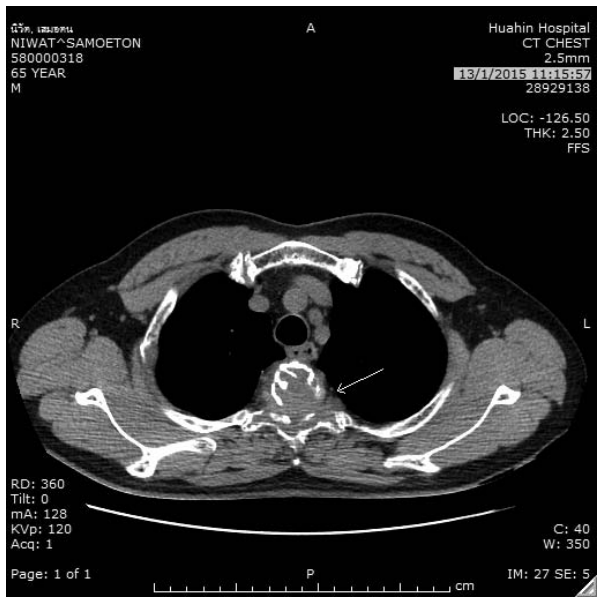

Fig. 8 Axial CT showed minimal paravertebral extension.

The patient was given intravenous packed red cell and later underwent decompressed laminectomy of T2-T4 with tumor removal. The pathology of tissue proven plastmacytoma. His neurologic examination was significant improved, and he was referred for chemotherapy.

Discussion

Multiple myeloma (MM) is a B-cell malignancy of antibody-secreting plasma cells expanding in the bone marrow.[1] Bone pain is the most common symptom in myeloma, affecting nearly 70% of patients. The pain usually involves the back and ribs, unlike the pain of metastatic carcinoma, which often is worse at night, the pain of myeloma is precipitated by movement. Persistent localized pain in a patient with myeloma usually signifies a pathologic fracture.[2-4]

Many of the clinical features of myeloma such as cord compression, pathologic fractures, hyperviscosity, sepsis, and hypercalcemia, can present as medical emergencies. Spinal cord compression is found about 5-10%.[4]

Criteria for diagnosis[5] The diagnosis of multiple myeloma requires the followings:

• A bone marrow aspirate or biopsy showing that at least 10 percent of the cells are plasma cells or the presence of a plasma cell tumor (called a plasmacytoma), plus at least one of the following two features:

• Evidence of damage to the body as a result of the plasma cell growth, such as severe bone damage, kidney failure, anemia, or high calcium in the blood, and/or

• Detection of one of the following findings: >60 percent plasma cells in the bone marrow; free light chain ratio of 100 or more (provided involved FLC level is at least 100 mg/L); or MRI showing more than one lesion (involving bone or bone marrow).

The bone lesions of myeloma are caused by the proliferation of tumor cells, activation of osteoclasts that destroy bone, and suppression of osteoblasts that form new bone. The classic radiographic appearance of multiple myeloma is that of multiple, small, well-circumscribed, lytic, punched-out, round lesions within the skull, spine, and pelvis. Lesions are lytic without reactive bone formation because of tumor factors those combine to activated osteoclasts and inhibit osteoblasts.[6]

The lesions tend to vary slightly in size. In addition, the bones of myeloma patients are, with few exceptions, diffusely demineralized, which may be indistinguishable from the pattern found in patients with simple senile osteoporosis.

Fewer than 10% of patients present with a single myelomatous lesion, a plasmacytoma, found on radiographs. These lesions are most common in the vertebral bodies. In other skeletal sites, they may manifest as bubbly expansile lesions, often in a rib or posterior element of the spine, but they can have a variety of shapes and sizes. They are occasionally associated with a soft tissue mass.

Magnetic resonance imaging (MRI) has been suggested as an additional imaging examination in patients with myeloma.[5,6] MRI has the advantage of rapidity and sensitivity for the presence of disease. The typical appearance of a myeloma deposit is a round, low signal intensity (relative to muscle) on T1-weighted images, which becomes high in signal intensity on T2-weighted sequences. The pattern could be focal lesions or diffuse involvement.[7] MRI shows a characteristic appearances of low signal intensity curvilinear areas within the vertebra or cortical irregularity.[8] However, metastatic lesions should be include differential diagnosis if diffuse involvement pattern.

References

1. Barlogie B, Shaughnessy J, Sanderson R, et al. Plasma cell myeloma. In: Lichtman MA, Beutler E, Kaushansky K, et al, editors. Williams' Hematology. 7 ed. New York: McGraw-Hill; 2005. p. 1501-33.
2. Munshi NC, Longo DL, Anderson KC. Plasma cell disorder. In: Longo DL, Fauci AS, Kasper DL, et al, editors. Harrison's Principle of Internal Medicine. 18 ed. New York: McGraw-Hill; 2012. p. 936-44.
3. Kyle RA, Gertz MA, Witzig TE, et al. Review of 1027 patients with newly diagnosed multiple myeloma. Mayo Clin Proc 2003; 78(1):21-33.
4. Chakraborti C, Miller KL. Multiple myeloma presenting as spinal cord compression: a case report. J Med Case Rep 2010;4:251.
5. Rajkumar SV, Dimopoulos MA, Palumbo A, et al. International Myeloma Working Group updated criteria for the diagnosis of multiple myeloma. Lancet Oncol 2014;15 (12):e538-48.
6. Angtuaco EJ, Fassas AB, Walker RC, et al. Multiple myeloma: clinical review and diagnosis Imaging. Radiology 2004;231(1): 11-23.
7. Moulopoulos LA, Varma DG, Dimopoulos MA, et al. Multiple myeloma: spinal MR imaging in patients with untreated newly diagnosed disease. Radiology 1992;185 (3):833-40.
8. Shah BK, Saifuddin A, Price GJ. Magnetic resonance imaging of spinal plasmacytoma. Clin Radiol 2000;55(6):439-45.