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Solitary Plasmacytoma of the Rib

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Solitary plasmacytoma of the bone, and especially of a single rib, is a rare disease. Here we report a 73-year old male patient complaining of continuous chest wall pain around the right 5th rib shaft who underwent a wide excision of the rib tumor with surrounding connective tissue. He was diagnosed with solitary plasmacytoma and will undergo radiation therapy. We report this case with a review of the literature.

Key words: 1. Tumor, malignant
2. Chest wall neoplasm
3. Plasmacytoma

CASE REPORT

A 73-year-old male patient with Herpes zoster of the right chest wall was referred for an incidental rib tumor. He complained of continuous chest wall pain that differed from post-zoster neuralgia, without palpation of a mass. The plain chest X-ray showed pleural thickening around the right 5th rib shaft, and a computed tomography (CT) scan confirmed a single rib tumor containing an osteolytic lesion (Fig. 1). An additional bone scan found an abnormal increase in the uptake of radioisotope in the same lesion (Fig. 2). A wide excision of the rib tumor with a 4 cm margin of normal bone and surrounding connective tissue was carried out (Fig. 3A). There were no perioperative complications. Microscopic in-

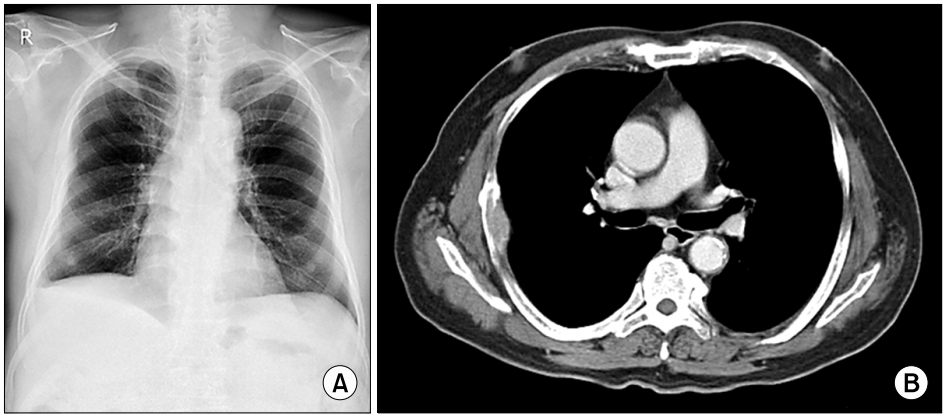

Fig. 1. (A) Simple chest X-ray showing pleural thickening around the right 5th rib. (B) Chest computed tomography scan demonstrates rib tumor with osteolytic lesion.

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vasion was not noted. Monoclonal proliferative solitary plasmacytoma of bone (SPB) was suggested by the histopathologic report that the destructed bone marrow was substituted with abundant neoplastic plasma cells containing Russell bodies (Fig. 3B) and was supported by the immunohistochemical staining for lambda chain (+), kappa chain (−) and methyl green pyronine stain (+). A postoperative positron emission tomography scan did not detect any distant metastasis or other bone lesions. We definitively diagnosed SPB by differential diagnosis from multiple myeloma (MM) and extramedullary plasmacytoma using intact bone marrow biopsy and low levels of serum or urine monoclonal paraprotein (M-protein) by immunoelectrophoresis. We are planning to treat the patient with radiation therapy.

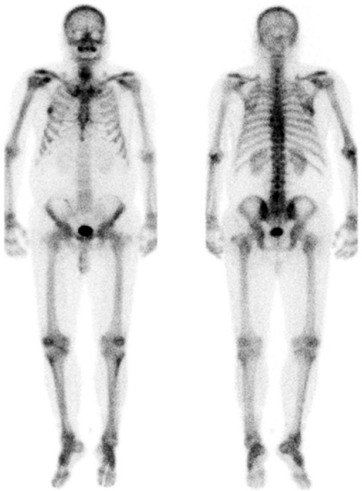

Fig. 2. Abnormally increased uptake of radioisotope in the right 5th rib in a bone scan.

DISCUSSION

Plasmacytoma involving the chest wall is a relatively uncommon primary tumor [1] classified as either MM, solitary plasmacytoma, extramedullary plasmacytoma or plasma cell leukemia. More than 95% of these tumors are MMs [2]. It is rare that the lesion of a solitary plasmacytoma is located on a rib, and this is only the second locally diagnosed case [3]. SPB occurs preferentially in relatively young patients below the age of 55 years and is twice as common in men as it is in women. The tumor can occur in any bone, but the spine is the most common lesion location, followed by pelvis and then rib. The most common symptoms are pain and spinal nerve compression, and facial palsy may develop when the skull is involved [4]. In the initial phase of progression, detection of monoclonal proliferation in serum or urine is more difficult and cellular levels are low. Diagnostic criteria are the presence of a single radiologic bone lesion without other bone lesions and deposition of plasma cells detected by tissue biopsy. No myeloma cells should be detected in a random bone marrow biopsy, but it is difficult to distinguish these cells from others. In addition, there must be no evidence of

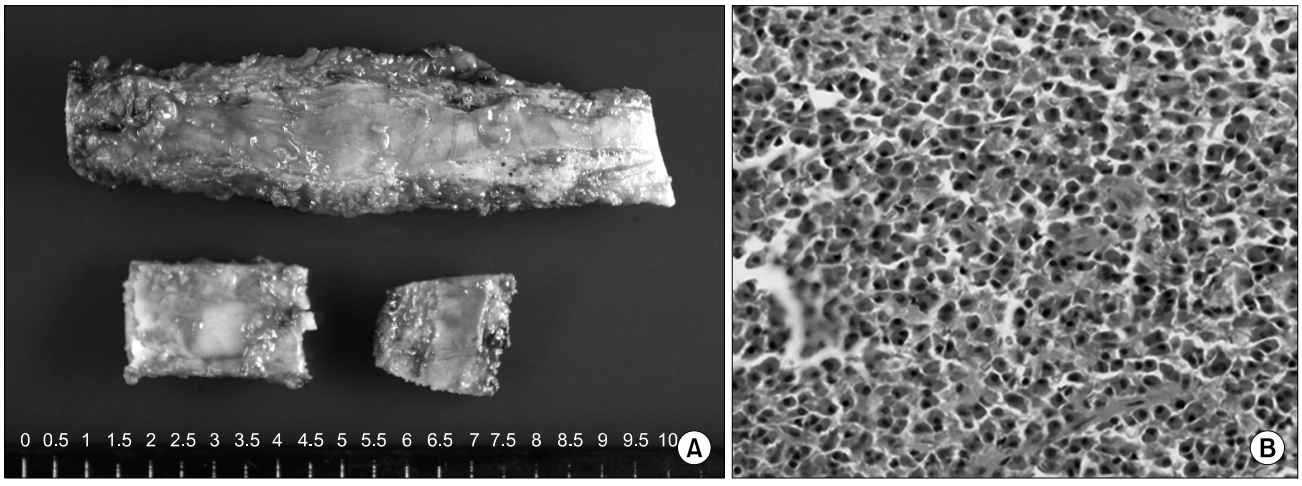

Fig. 3. (A) Gross finding of excised rib. (B) Microscopic view shows abundant neoplastic plasma cells (H&E, ×400).

hyperkalemia, anemia or nephropathy leading to myeloma in a hematologic study. With regard to radiologic evaluation, a CT scan is useful for a regional biopsy, and thoracic to lumbar spinal magnetic resonance imaging can detect spinal lesions to easily differentiate them from MM. However, a bone scan is not recommended due to poor reliability [2]. The purpose of treatment of SPB is to protect against transformation into MM and recurrence, mainly using radiation therapy. Although there is no established relationship between dosage and response, 40 to 50 Gy radiation in 20 to 25 fractions has usually been recommended. A therapeutic response is usually observed in 90% to 100% of patients, and complete remission often reaches a maximum rate of 30% [2,5]. Even if extended irradiation including the whole bone lesion adversely affects normal tissue, the therapeutic range should include an area of normal tissue at least 2 cm above the lesion. When performing surgical resection, the possibility of structural instability and nerve injury should be considered for spinal lesions. For other lesions, variable surgical strategies can be applied according to the tumor size, extent, patient's general condition or surgeon's experience [2]. In addition, some reports suggest the effectiveness of concurrent chemoradiation therapy, but little evidence has been presented [6]. In terms of prognosis, Weber [5] reported that most SPBs were transformed into MM within a maximum of 2 to 3 years and proposed their use as positive prognostic factors through resolution of M-protein or disappearance of other bone lesions for more than a year after radiation therapy. Reed et al. [7] advocated that the location of the primary lesion and the initial level of serum M-protein at diagnosis were significant for prognosis, but that race, sex or urinary presentation of Bence Jones protein were not. Kilciksiz et al. [8] reported that age greater than 55 years old could be an independent factor related to transition to MM. In another review of the literature, several prognostic factors such as tumor size greater than 5 cm, existence of spinal lesion, radiation dosage, and level of serum M-protein were suggested but are controversial and have little statistical significance [2,6,7]. The patient in this case study underwent a wide excision of a solitary rib tumor containing normal tissue without preoperative confirmation of diagnosis. The histopathologic diagnosis of SPB was confirmed, and a minimal dose of radiation therapy is planned for protection against tumor recurrence. We report a rare case of solitary plasmacytoma of a single rib with its diagnosis and surgical treatment.

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