

REVIEW

Imaging findings of extraosseous multiple myeloma

Michael Patlas[†], Irith Hadas-Halpern[†] and Eugene Libson[‡]

[†]Department of Radiology, Shaare Zedek Medical Center, P.O. Box 3235, Jerusalem 91031, Israel; [‡]Department of Radiology, Hadassah University Hospital, P.O. Box 12000, Jerusalem 91120, Israel

Corresponding address: Michael Patlas, 40 Gerrard Street East, Apt 2711, Toronto ON, Canada M5B 2E8
Tel/Fax: (1) 416 598 3259. E-mail: patlas69@yahoo.com

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Abstract

Multiple myeloma is characterised by a progressive proliferation of malignant plasma cells usually initiating in the bone marrow. The most common manifestations of this disease are bone involvement, renal disease and hematologic disorders. The radiological findings of diffuse osteopenia or osteolytic bone lesions are well recognised. Extraosseous myelomatous masses are found in less than 5% of multiple myeloma patients. The purpose of this essay is to acquaint the radiologist with this phenomenon and to illustrate the imaging features of the extraosseous masses of this unusual manifestation of multiple myeloma.

Keywords: CT; US; mammography; myeloma.

Patients and methods

We retrospectively reviewed the radiological files of 200 myeloma patients in two Jerusalem hospitals and recorded all the cases that had extraosseous masses. The organs involved and the imaging findings were recorded. Patients with extraosseous myeloma in contiguity with bony involvement were excluded from our series.

Results

Out of the 200 patients we found eight cases of extraosseous myeloma (age range 48–82 years, mean age 60 years). Two patients were men, and six were women. CT was available in six patients, mammography in three patients, and ultrasound in one patient. Different sites of extraosseous involvement were present: breast (three patients), lymph nodes (one patient), thyroid cartilage (one patient), pancreas and stomach (one patient), adrenal and pleura (one patient), meninges (one patient). Two patients had masses in more than 1 site (adrenal and pleura; stomach and pancreas). Definite histologic diagnosis of plasmacytoma was available in all cases.

Discussion

Extraosseous myeloma is an uncommon and more aggressive form of multiple myeloma^[1]. It is found in less than 5% of myeloma patients^[1]. Submucosal tissue of the upper airways was reported as the most frequent site of involvement^[2]. Extramedullary plasmacytomas have also been encountered in the gastrointestinal tract, lymph nodes, spleen, parotid gland, vagina, breast, pancreas, thyroid and testes^[3].

Breast

Three of our patients had breast masses shown by mammography and ultrasound. So far there have been few case reports of plasmacytoma of the breast^[4]. Breast plasmacytomas are solid, nontender, well defined masses of various sizes^[5]. All three patients (two women and one man) in our series presented with a breast lump. Mammography revealed round and well defined masses, which could not be differentiated from fibroadenoma, but could also represent malignant lesion (Fig. 1(a)).

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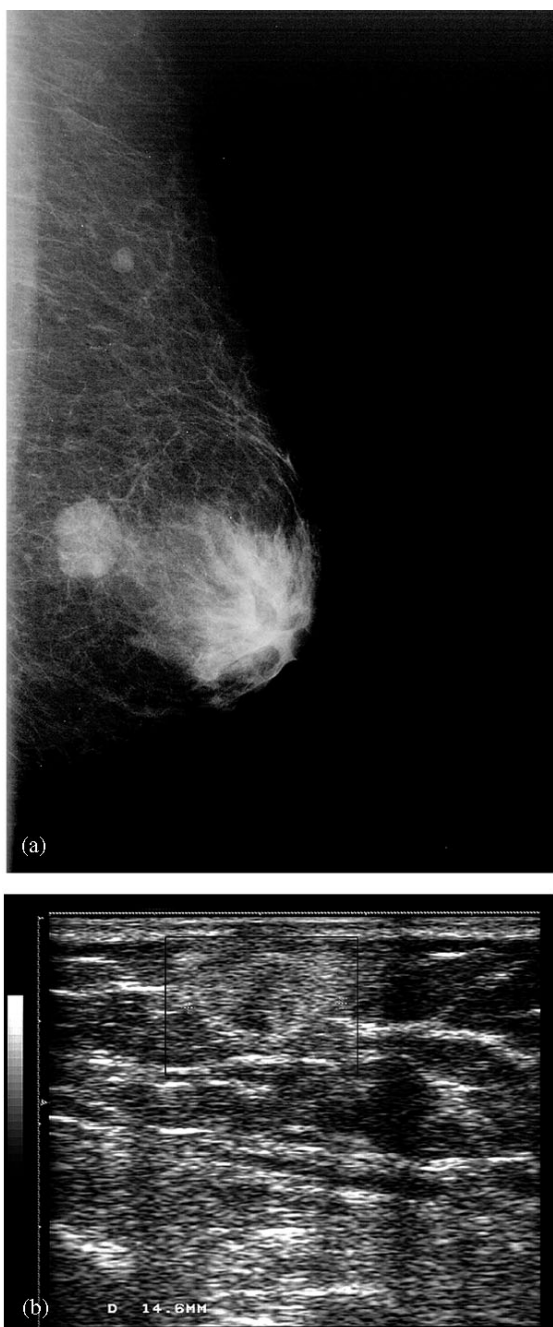


Figure 1 A 71-year-old man with myeloma and involvement of breast. The non-tender lump in the centre of the left breast proved to be a plasmacytoma. (a) Medio-lateral oblique mammogram shows a well-defined lobulated mass. (b) Sonography shows solid mass with homogeneous echo-texture (arrows).

Sonography was performed in one case and showed a solid well-demarcated mass with homogeneous echo texture resembling a benign lesion (Fig. 1(b)).

Lymph nodes

Lymph nodes were the most frequently involved tissue in one series^[5]. Their CT appearance is similar to

that of lymphoma. We found one case of an enlarged supraclavicular lymph node, which was found on histology to be plasmacytoma (Fig. 2).

Stomach and pancreas

Plasmacytomas of the gastrointestinal tract are extremely rare. To the best of our knowledge the gastric wall mass with ulceration, as seen in one of our patients (Fig. 3(a)), has not been previously described. The same patient also had a non-contiguous well-defined hypo-dense mass involving the head and the body of the pancreas as shown on CT (Fig. 3(b)). Biopsy of both sites revealed plasmacytoma. We found only one previously reported case of imaging features of pancreatic plasmacytoma in which there was a hypervascular mass simulating islet-cell tumour^[5].

Genitourinary system

Renal disease in multiple myeloma has several well-recognised causes such as amyloidosis. Only rarely is plasma cell infiltration of kidneys implicated^[6]. We found one case of large adrenal and perirenal masses (Fig. 4(a)), in which a CT guided biopsy from the adrenal mass, revealed plasmacytoma.

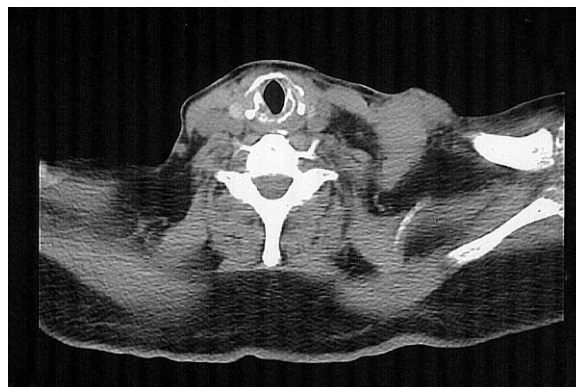


Figure 2 A 61-year-old woman with multiple myeloma. CT scan shows enlarged left supraclavicular lymph nodes.

Respiratory system

Involvement of the lungs and pleura in multiple myeloma is also rare^[5]. Our case demonstrates multiple pleural masses indistinguishable from mesothelioma (Fig. 4(b)). There was no evidence of rib involvement. We also found one case of plasmacytoma involving the thyroid cartilage.

Central nervous system (CNS)

CNS involvement independent of bone lesions occurs in less than 1% of patients with multiple myeloma^[5].

One of the patients in our series had an extra-axial mass arising from the meninges with CT imaging findings similar to those observed in patients with meningioma.

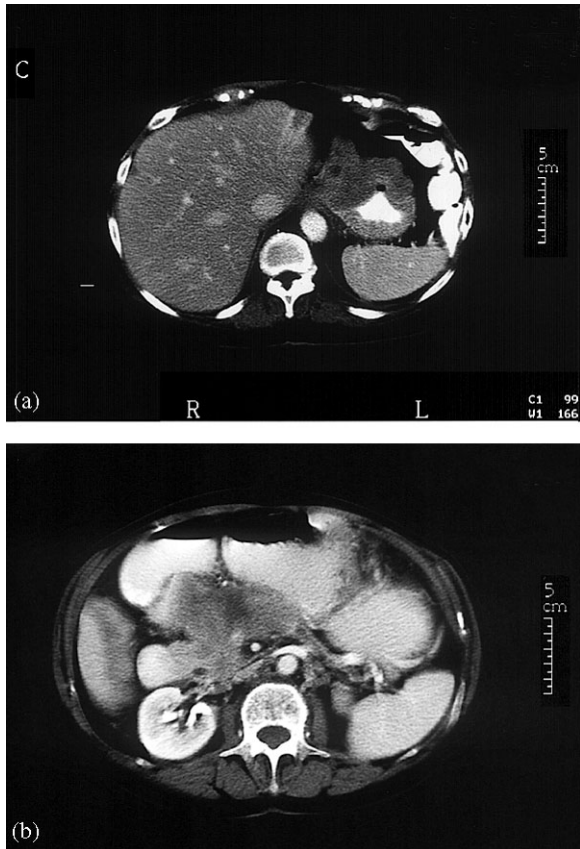


Figure 3 An 82-year-old woman with known multiple myeloma. (a) Contrast-enhanced CT scan of abdomen shows anterior gastric wall mass with ulceration. (b) Abdominal CT obtained 5 months later shows large hypodense mass infiltrating the head and the body of the pancreas. Biopsy confirmed myelomatosis.

Conclusion

In conclusion, our small series presents a gamut of extraosseous findings in various organs. Extraosseous myeloma is very rare and may involve various organs and systems. Clinicians and radiologists should be aware of these rare manifestations and consider this possibility whenever a myeloma patient develops an extraosseous mass.

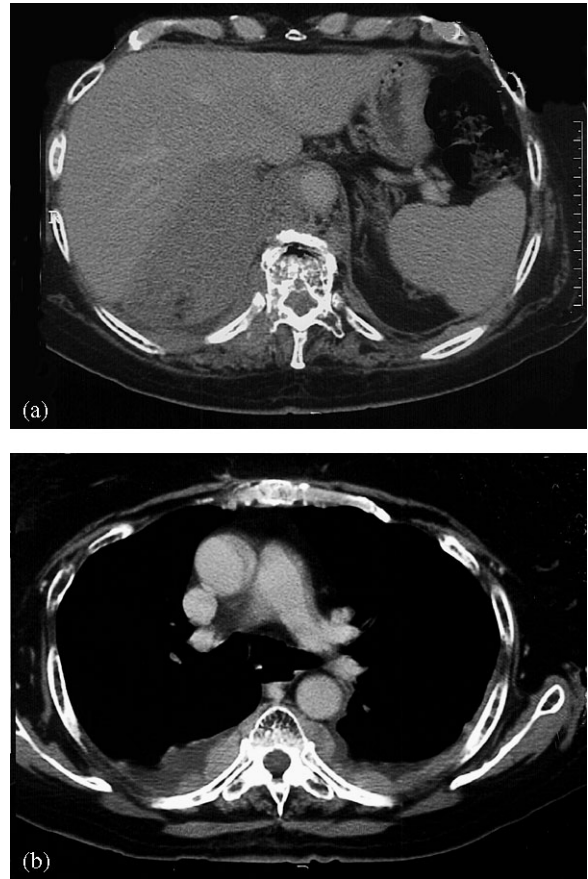


Figure 4 A 60-year-old woman with extraosseous myeloma. Abdominal CT shows right adrenal mass. Posterior chest wall mass is not in contiguity with adrenal plasmacytoma. CT scan of chest shows bilateral pleural effusions and soft tissue masses. The bones look intact.

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