BONE IMAGING IN BURKITT'S LYMPHOMA

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ABSTRACT

Burkitt's Lymphoma is a tumour of B lymphocytes and unlike other lymphomas tend to be extranodal rather than nodal. Most radionuclide imaging of this disease has been with Gallium-67 citrate (Ga-67). Radionuclide bone imaging with Technetium-99 methylene diphosphonate (Tc-99m MDP) reports increased activity in areas of bone involvement with a single report of uptake in metastatic calcification in the lungs and gastric mucosa [1]. We present a case of primary Burkitt's lymphoma of the mandible that shows decreased uptake on a Tc-99m MDP bone scan.

Keywords: Burkitt's lymphoma, radionuclide bone scan.

CASE REPORT

A three year old Indonesian Chinese boy presented with a three-month history of a right mandibular mass. It was non tender with a gradual increase in size over this period. He was otherwise well with no significant past medical or family history. Physical examination revealed right mandibular and inner cheek swelling. There were no teeth loosening, lymphadenopathy or other abnormal findings. Apart from an elevated lactase dehydrogenase (LDH) at 804 (normal:300-700), the other blood results were normal. The anti-EBV VCA/IgG titres were raised at 640 (normal<5). Bone marrow aspirates were normal.

Plain radiographs show mottled small lucencies in the body and ramus of the right mandible (Fig. 1). Contrast-enhanced Computed tomography (CT) revealed a large soft tissue mass on either side of the right mandible obliterating the parapharyngeal space. The right masseter muscle was inseparable from the mass. There was irregularity of the bony cortex but no overt bone destruction (fig. 2). A Magnetic Resonance Imaging (MRI) examination of this region showed a right mandibular mass with the masseter muscle stretched around it (Fig. 3). There was bilateral small cervical lymphadenopathy. In addition there were several small enhancing lesions in the sphenoid bone that were thought to represent other areas of bone involvement. A SPECT Tc-99m MDP bone scan showed decreased uptake of the right mandibular body (Fig. 4). There were no other abnormal areas of activity in the rest of the skeleton. An open biopsy of the tumour was performed. Histopathology revealed a monotonous, diffuse infiltrate of small round cells with a starry-sky appearance consistent with Burkitt's lymphoma.

DISCUSSION

Burkitt's lymphoma has shown an interesting epidemiological pattern. It is endemic in Africa where it represents a common childhood malignancy with the mandible being the site most frequently involved. Non-endemic Burkitt's lymphoma is

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uncommon; the terminal ileum, cervical lymph nodes and bone marrow are the most frequently involved sites. The incidence in non-endemic Burkitt's lymphoma in the mandible is 15-18%. Despite this interesting epidemiological difference, the tumour from both the endemic and non-endemic areas shows similar histopathology and responds to the same treatment [2].

Gallium scintigraphy has been found to be useful in the list of investigations in the staging of Burkitt's lymphoma as well as post-chemotherapy assessment [3,4]. Increased gallium uptake is typically seen at sites of tumour involvement and has been shown to be more sensitive than bone scintigraphy and plain radiography. Tc-99m MDP scintigraphy has shown areas of bone involvement in the rest of the skeleton though less sensitive than gallium that also has the advantage of assessing other non-skeletal sites of involvement. Increased uptake of Tc-99m MDP in soft tissues with metastatic calcifications in Burkitt's lymphoma in lungs and stomach has, however, been reported. In our patient, the primary bone lymphoma shows decreased uptake on the bone scan. With the clinical picture of a soft tissue tumour related to bone the differential diagnoses are those of a soft tissue sarcoma, lymphoma and osteomyelitis. Osteomyelitis was excluded based on clinical findings though Burkitt's lymphoma may present with systemic symptoms not unlike osteomyelitis. In any case the bone scan would exclude osteomyelitis as a possibility as typically there would be marked increased activity on the bone scan. A soft tissue sarcoma with bone destruction would also be expected to show increased activity due to bone reactivity to the tumour. This appearance of a "cold" lesion on bone scan with Burkitt's lymphoma has not been previously reported and would suggest that this appearance on a bone scan of a primary mandibular lesion in a child would favour the diagnosis of lymphoma rather than other tumours or infection.

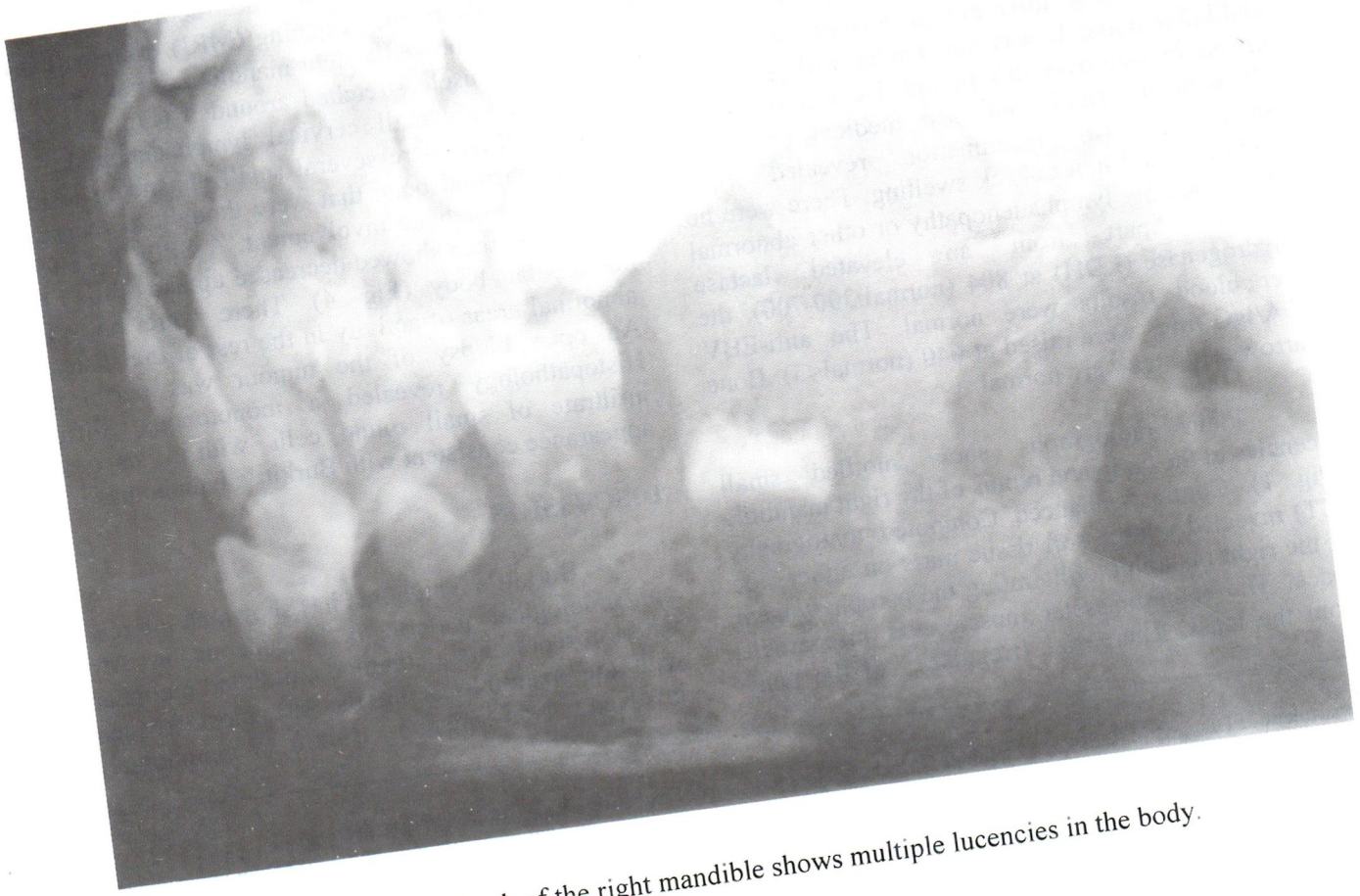

Fig. 1 Radiograph of the right mandible shows multiple lucencies in the body.

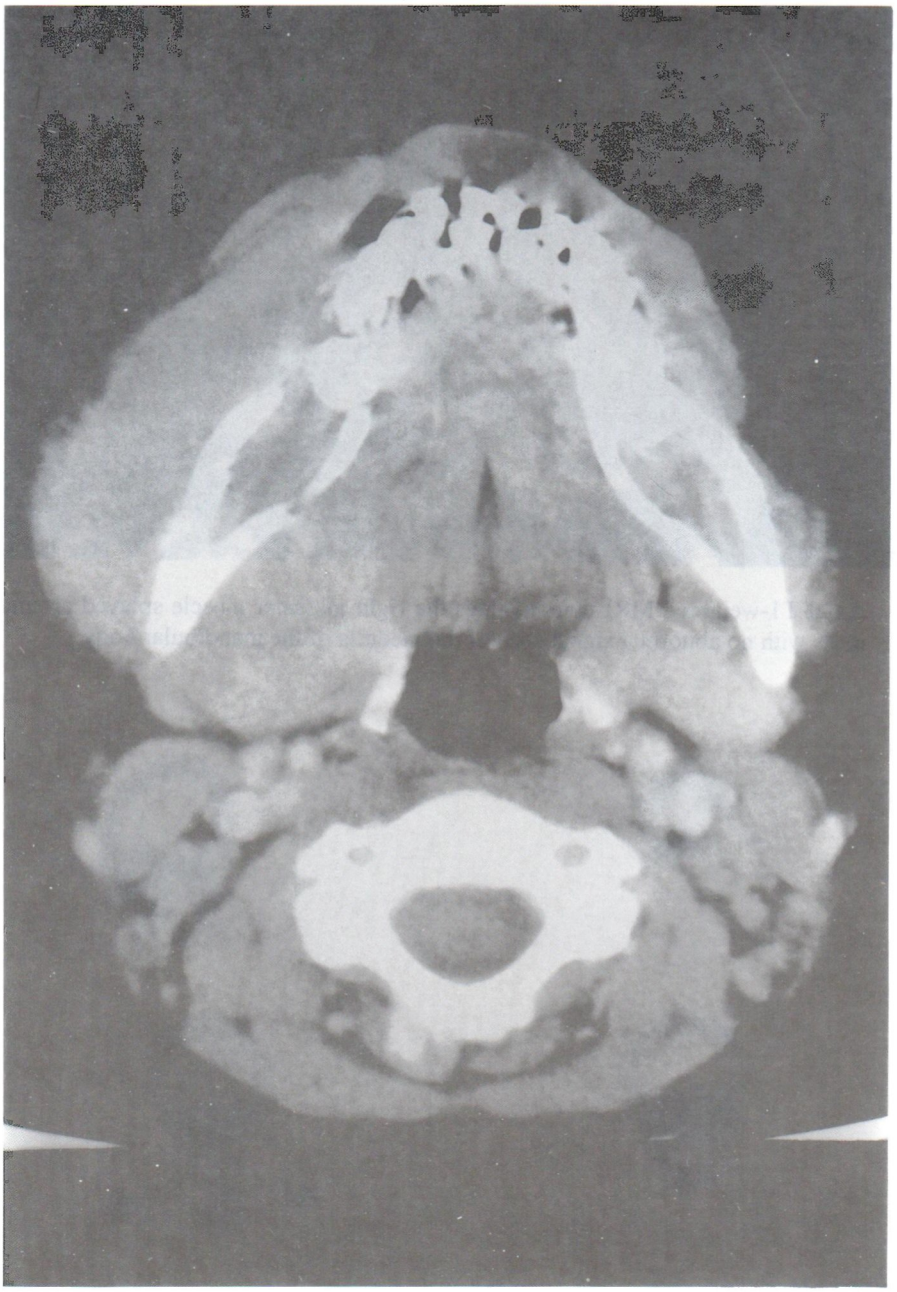

Fig. 2 Contrast-enhanced CT scan shows a soft tissue mass inseparable from the masseter muscle on either side of the right mandible. There is no bony destruction.

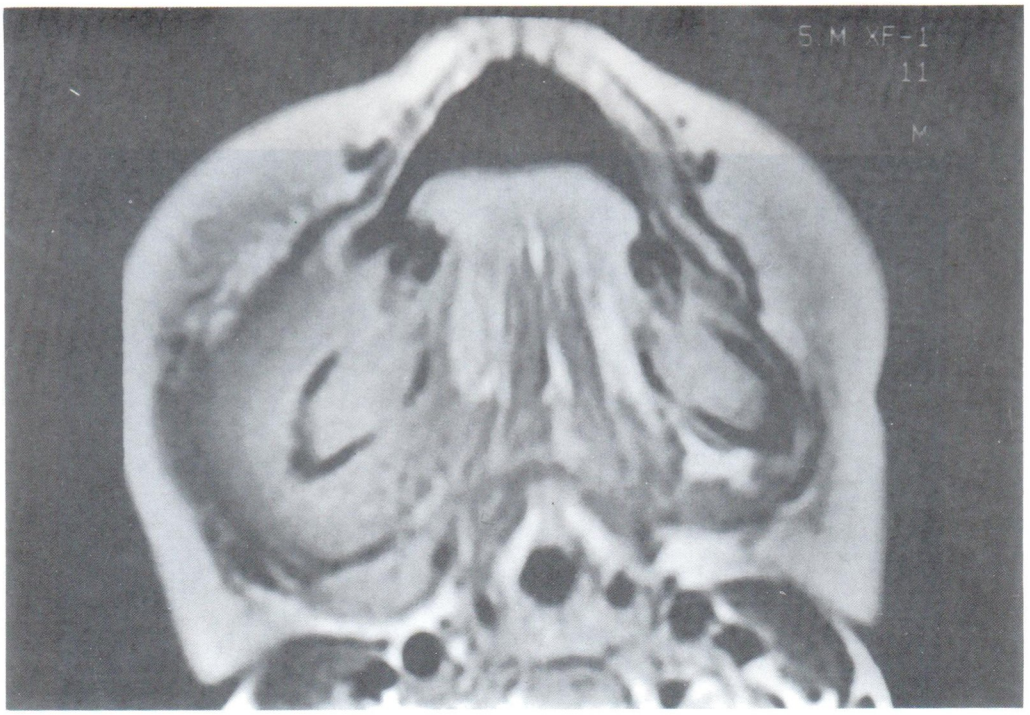

Fig. 3 Axial T1-weighted MRI demonstrates the right masseter muscle splayed around a soft tissue mass with no abnormal signal seen of the medulla of the mandibular body.

Fig. 4 A SPECT Tc-99m MDP bone scan shows abnormal decreased activity of the right mandible.

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