

Uptake of pentavalent technetium-99m dimercaptosuccinic acid in idiopathic synovial chondromatosis

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We reported two Tc-99m(V) DMSA scintigrams in patients with idiopathic synovial chondromatosis which affected the metacarpo-phalangeal joint and shoulder joint. Tc-99m(V) DMSA accumulated markedly and diffusely in the tumor. Tc-99m(V) DMSA scintigraphy would be valuable for deciding the optimal site for biopsy.

Key words: synovial chondromatosis, scintigraphy, pentavalent technetium-99m dimercaptosuccinic acid, MRI

INTRODUCTION

IDIOPATHIC SYNOVIAL CHONDROMATOSIS is a rare tumor-like disorder in the soft tissue.¹ The histologic picture is often confusing, a wide spectrum of cartilage maturity may be represented, and small biopsy specimens resected from the area of active growth are often diagnosed as low-grade chondrosarcoma. However, synovial chondromatosis is a benign, metaplastic condition and its malignant transformation is rare.^{2,3} We have already reported that pentavalent technetium-99m dimercaptosuccinic acid (Tc-99m(V) DMSA) accumulated in almost all active chondrogenic tumors, especially in chondrosarcoma.⁴ In this paper, we report two cases of histologically active synovial chondromatosis which showed marked uptake of Tc-99m(V) DMSA.

CASE REPORT

Case 1

A 60-year-old woman presented with a large painless mass in her right palm which had been slowly enlarging over the past three years. Despite the large size of the lesion the patient reported no functional impairment. There was no history of trauma. On physical examination, the mass was found to be located over the area of the third

metacarpo-phalangeal (MP) joint in the distal palm but was not fixed to the skin or underlying structures. Radiographs revealed a lobulated lesion with fine irregular calcification volar to the joint and not eroding bone (Fig. 1a). Tc-99m(V) DMSA markedly accumulated in the tumor (Fig. 1b). The entire lesion was surgically removed. The histologic diagnosis was synovial chondrometaplasia on the basis of the finding of active foci of chondroid and hyaline cartilage of various degree of development surrounded by the synovium.

Case 2

A 48-year-old woman who had a gradually enlarged swelling in the left shoulder was admitted to our hospital in 1994. She had been treated unsuccessfully as a case of chronic arthritis of the left shoulder joint for the previous three years. Plain radiogram and MRI showed diffuse tumor-like thickening of the synovium on the left shoulder joint with spotty calcifications. Signal intensity of the thickened synovium was lower on T₁-weighted images and higher on T₂-weighted images than that of the adjacent subcutaneous fat (Fig. 2a, b). Tc-99m(V) DMSA scintigraphy showed marked accumulation in this tumor-like lesion on the left shoulder (Fig. 2c). Open biopsy was performed and the histologic findings of the lesion were similar to those in case 1. The final diagnosis was synovial chondromatosis.

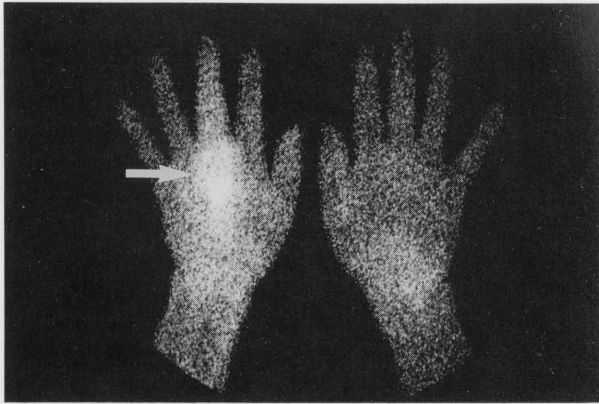
These patients were fully informed about Tc-99m(V) DMSA scintigraphy to decide whether these tumors in the soft tissue were active or not, and agreed to have the examination.

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a

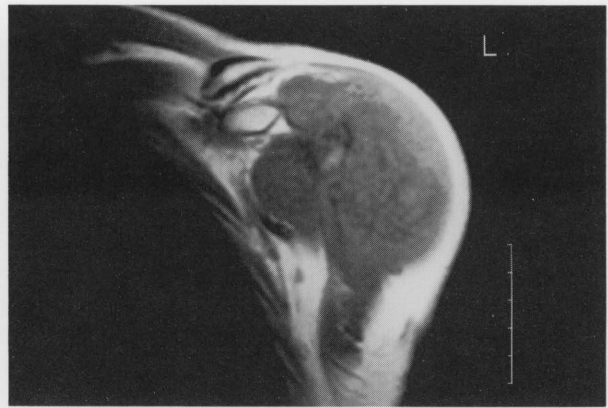


b

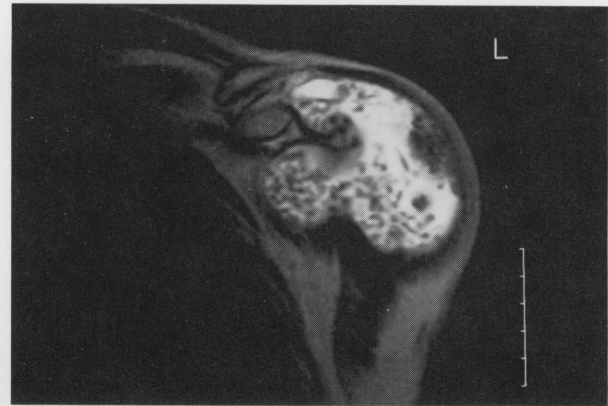
Fig. 1 a. A plain radiogram of the right hand in case 1 showed a dense soft tissue mass with spotty calcifications (arrow) on the MP joint of the midfinger. b. Marked accumulation of Tc-99m (V) DMSA was shown in the tumor (arrow) on the right palm.

DISCUSSION

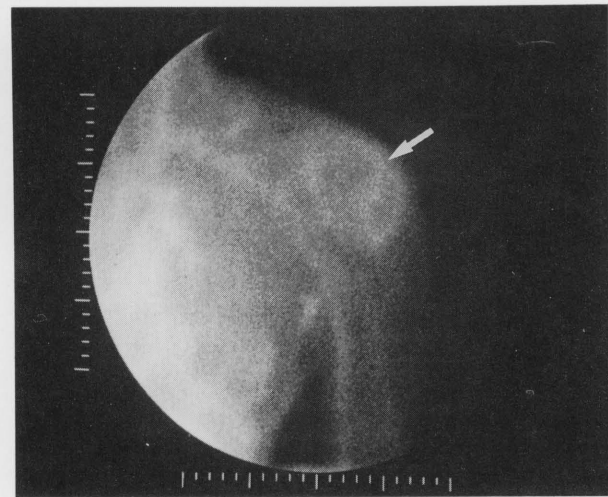
Idiopathic synovial chondromatosis is an unusual condition characterized by cartilage formation within metaplastic synovium. It usually is monoarticular and predominantly affects the knee, hip or elbow.² The small joints in the hands and feet are rarely affected.⁵ Clinically, patients typically present with pain, swelling, and limitation of motion. This disorder tends to be progressive, although rare cases of spontaneous regression have been reported.⁶ Currently accepted surgical treatment consists of removal of any free intraarticular bodies and complete resection of the synovium involved. If the diseased synovium is not removed, the chance of recurrence is increased.²



a



b



c

Fig. 2 a. A T₁-weighted MR image of the left shoulder showed diffusely tumor-like thickening of the synovium on the left shoulder joint, which was iso-intense to the skeletal muscles and low-intense to the adjacent subcutaneous fat. b. A T₂-weighted MR image showed a high-intense tumor including the spotty, low-intense calcifications. c. A Tc-99m(V) DMSA scintigraphy showed the diffuse high accumulation of the tracer in the tumor on the left shoulder (arrow). The accumulation of Tc-99m(V) DMSA in supraclavicular and axillary regions, which was often shown in disease-free patients, would be caused by the radioactivity of the blood pool in dilated veins distal to valves.

Microscopically the lesions have islands of cartilage or chondroid, usually lobulated, surrounded by synovial tissue. The histologic appearance of these lesions is often worrisome. Cells with large irregular or multiple nuclei, as well as areas with a myxoid or xanthoma-like appearance, are often noted. Dalhin and Salvador remarked that the nuclei were "suggestive of malignancy in most cases" in their series, although all were actually proven benign.⁷ They are believed to represent areas of active growth. In both our cases, frozen sections of the biopsy specimens were diagnosed as grade 1 chondrosarcoma intraoperatively, on the basis of the foci of active chondroid cells.

On scintigraphic studies, some physicians have already reported that various agents for bone scans accumulated in the synovial chondromatosis.^{8,9} Those findings reflected the activity of the phosphate metabolism which would relate to the calcification or ossification of the chondroid, but not the active growth of the chondroid cells. Tc-99m(V) DMSA was a tumor-seeking agent previously reported to be very useful in the detection and diagnosis of various soft tissue tumors, especially malignant and rapidly growing tumors.¹⁰⁻¹² In addition, Tc-99m(V) DMSA markedly accumulates in the cartilaginous tumor of the bone which contains large numbers of active or malignant chondroid cells.⁴ Tc-99m(V) DMSA would therefore also accumulate in synovial chondromatosis, in which there are many active chondroid cells.

Although chondrosarcoma arising from normal synovium or synovial chondromatosis was reported to be extremely rare,³ the recurrence of synovial chondromatosis was not rare especially in patients without total synovectomy of the affected joint.² Tc-99m(V) DMSA would be valuable in detecting the most active foci in the lesion or a recurrent lesion and deciding the inactive site, which is appropriate for biopsy.

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