

## IMAGING GAMUT

## Myocardial uptake of $^{99m}\text{Tc}$ -MDP in infective endocarditis

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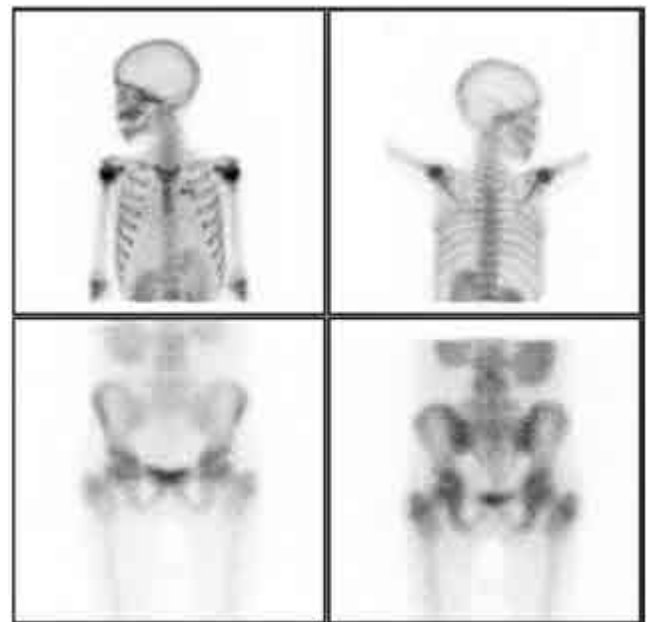
**Key words:** Infective endocarditis, Tc-99m MDP bone scan, SPECT-CT

**Background** A 10-year-old girl with congenital heart disease was diagnosed with infective endocarditis. The patient developed pain in her right hip region. Her chest and pelvic x-rays were unremarkable. She was referred to the nuclear medicine department for a bone scan to investigate a musculoskeletal cause for the pain.

**Procedure** Planar bone scintigraphy was performed 3 hours after an intravenous injection of 370 MBq  $^{99m}\text{Tc}$ -methylene diphosphonate ( $^{99m}\text{Tc}$ -MDP). This was followed by a SPECT-CT of the upper trunk.

**Findings** The planar bone scan showed focal soft-tissue uptake in the left chest lateral to the sternum and adjacent to the anterior end of the ribs in the 2nd intercostal space (Figure 1). SPECT images showed tracer uptake just posterior to ribs on the left side (Figure 2). Fused CT-SPECT images revealed tracer uptake at the upper lateral part of the heart (Figure 3).

Her Echocardiography showed patent ductus arteriosus (PDA) with left-to-right shunt and mitral and tricuspid regurgitation. There were



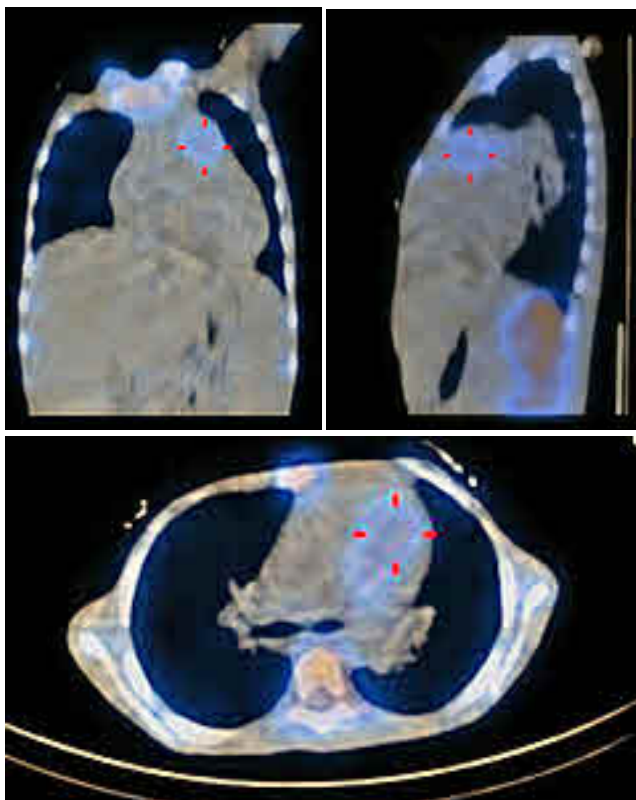
**Figure 1** Bone scan images of the trunk in the anterior (left column) and the posterior (right column) projections with focal soft-tissue uptake in the left chest region (arrow)



**Figure 2** Bone SPECT images in the sagittal (left), axial (middle) and coronal (right) slices showing focal increased soft-tissue uptake (arrows)

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**Figure 3** Fused SPECT-CT images in the coronal (top left), sagittal (top right) and axial (bottom) projection slices showing cardiac uptake (cross hair)

vegetations over PDA and thickened and prolapsing anterior mitral commissure.

**Conclusion** It was speculated that cardiac calcinosis associated with vegetations over PDA or the thickened prolapsed mitral valve was the likely cause of focal increased  $^{99m}\text{Tc}$ -MDP uptake seen in this case as has been suggested in the published literature [1, 2].

**Comments**  $^{99m}\text{Tc}$ -MDP soft-tissue uptake can be divided into five categories including dystrophic calcification, metastatic calcification, metabolic uptake, compartmental sequestration and spurious or artifactual uptake. Dystrophic calcification occurs in patients with normal  $\text{Ca}^{2+}$  and  $\text{PO}_4$  levels and refers to  $\text{Ca}^{2+}$  deposition in tissues secondary to histologic disruption caused by trauma, ischaemia or cellular necrosis or in the enzymatic necrosis of fat. It is thought that calcium ion binds to phospholipids present in membrane bound vesicles, phosphatases generate phosphate groups which in turn bind to the

calcium, and the cycle is repeated until local concentrations are elevated and crystals begin to form [3]. Tissue damage from inflammation or infection results in calcium deposition based on their pathophysiologic characteristics resulting in dystrophic calcification [4].

There are several reports of myocardial uptake of MDP in the literature including uptake in amyloidosis, multiple myeloma and cardiac calcinosis in haemodialysis patients [5, 6] but the case of MDP cardiac uptake in infective endocarditis has not been previously reported.

## References

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