

## Case report

# Hybrid Single-Photon Emission Computed Tomography/Computed Tomography Imaging Features of Tumoral Calcinosis in Technetium-99m Methylene Diphosphonate Bone Scintigraphy

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## Abstract

Tumoral calcinosis (TC) is an uncommon ectopic calcification syndrome. TC is a benign condition characterized by the presence of large calcific soft tissue deposits occurring predominantly in a periarticular location. It generally occurs as a complication of renal dialysis or trauma, and is rarely seen in familial and sporadic cases. Bone scintigraphy is a sensitive method for diagnosing TC. We report a case of year old female with. She underwent bone scintigraphy to see the sites of involvement, which showed intense foci of tracer activity in soft tissue in bilateral thigh and gluteal region. Hybrid single-photon emission computed tomography/computed tomography of the pelvis and thigh localized tracer uptake to the calcification in the gluteal and thigh region.

**Keywords:** Single-photon emission computed tomography/computed tomography, technetium-99m-methylene diphosphonate, thigh and gluteal region, tumoral calcinosis

## Introduction

Tumoral calcinosis (TC) is a rare condition resulting from dense extraosseous calcification due to a deranged serum phosphate and calcium product.<sup>[1]</sup> Technetium-99m (Tc-99m) methylene diphosphonate (MDP) scintigraphy has been recognized as a modality for detecting metabolic osteopathy and extraosseous calcification.<sup>[2]</sup> Few reports have demonstrated the ability of Tc-99m MDP scintigraphy in detecting TC.<sup>[3]</sup> Hybrid single-photon emission computed tomography/computed tomography (SPECT/CT) help in localizing uptake to the TC has not been reported yet.

## Case Report

A 60-year-old female patient presented with complaints of pain in the gluteal region. She had no history of trauma, and no other systemic illness was elicited. The anteriorposterior thigh graphy, showed a linear calcification in the left thigh [Figure 1]. Laboratory evaluation including serum calcium, phosphorus, and parathormone, and alkaline phosphatase levels were within normal limits. Tc-99m MDP whole body bone scintigraphy revealed an increased uptake with a heterogenic character, in the bilateral gluteal and thigh regions [Figure 2]. SPECT/CT of thigh showing increased uptake localized to the linear soft tissue calcification in the thigh [Figure 3].

## Discussion

Inclan *et al.*<sup>[4]</sup> first used the term TC to describe the tumor-like deposition of dense, nodular, calcareous masses in the tissues about the hips, shoulders, and

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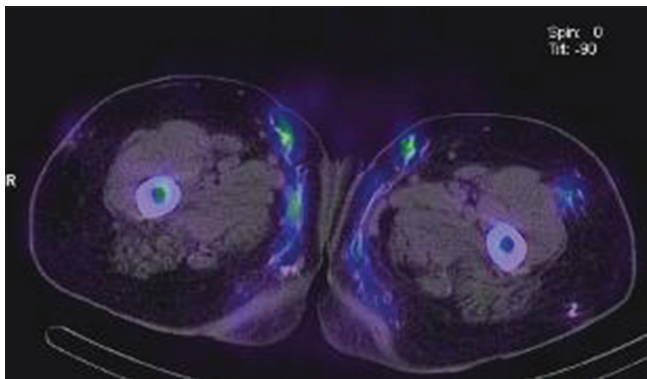
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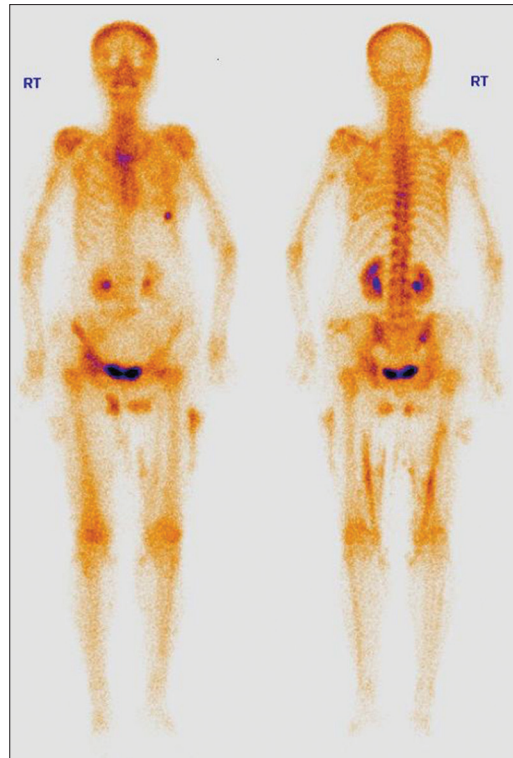


**Figure 1:** The anteroposterior thigh graphy showed linear calcification in the left thigh (arrow)



**Figure 3:** Axial single-photon emission computed tomography/computed tomography images of thigh localizes tracer uptake to the calcification in the soft tissue in bilateral thighs

elbows, sometimes with smaller masses adjacent to the spine and other joints. African descent is reported to have a higher prevalence.<sup>[5]</sup> Smack *et al.*<sup>[6]</sup> formulated a pathogenesis-based classification of the TC into three types. (1) Primary normophosphatemic TC; (normal levels of phosphate and calcium, sporadic cases). (2) Primary hyperphosphatemic TC (elevated serum phosphorus and normal serum calcium, familial, and most common in the black race and males). (3) Secondary TC: (Chronic renal failure with secondary hyperparathyroidism, hypervitaminosis D, milk-alkali syndrome, and bone destruction). The symptoms often occur insidiously, and the lesions grow slowly, most frequent involving the hip, then buttocks, elbows, and smaller joints. The patient in the present case had no family history, biochemical abnormalities or underlying medical condition known, to promote calcification. The origin of primary normophosphatemic TC (type 1 of the Smack classification) remains unknown, as the condition occurs sporadically, and patients with the disorder have no abnormalities on laboratory examination. Consequently, the present case was classified as type 1 of the Smack classification.



**Figure 2:** Technetium-99m methylene diphosphonate whole body bone scan showing increased uptake noted in soft tissue in the bilateral thigh and gluteal region

Radiographic findings often demonstrate several dense calcified opacities with a rounded or flocculent appearance projecting within soft tissue without evidence of bony involvement.<sup>[7]</sup> Few reports have demonstrated the ability of Tc-99m MDP scintigraphy in detecting TC.<sup>[3,8]</sup> Proposed mechanism leading to increased extraosseous Tc-99m MDP uptake include extracellular fluid expansion, enhanced regional vascularity and permeability, diminished lymphatic or venous removal from the affected area, and elevated tissue calcium concentration.<sup>[9]</sup> Because of the advent of SPECT/CT, it is possible to localize exact site of tracer uptake and characterize the lesion to guide further management.<sup>[10]</sup> Our case is the first case of SPECT/CT demonstrating TC.

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