

# Pulmonary calcification in renal failure patient incidentally revealed by bone scintigraphy

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**ABSTRACT** Pulmonary calcification is a subdiagnosed metabolic lung disease that is commonly asymptomatic and frequently associated with end-stage renal disease. We report a case of a 21-year-old man with a 4-year history of end-stage renal disease without respiratory symptoms. We discover incidentally on a bone scan a pulmonary calcification. Parathyroidectomy was refused by the patient. After 3 months of medical treatment, a second bone scan was done, and we found a partial response.

**Keywords:** Bone scintigraphy, hemodialysis, lung calcification

## INTRODUCTION

Pulmonary calcification, typically asymptomatic, can be caused by a number of diseases, most common being end-stage renal disease. We describe a case of pulmonary calcifications associated with chronic kidney failure, which has been improved by medical treatment.

## CASE REPORT

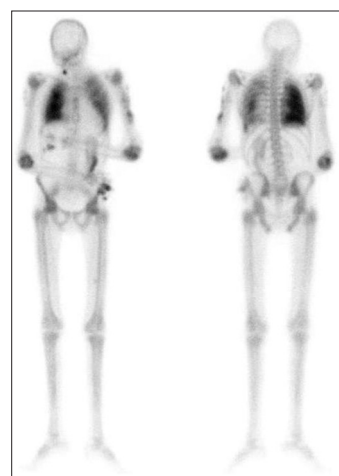
A 21-year-old man with a 4-year history of end-stage renal disease, on hemodialysis (three 4-h sessions/week), secondary to untreated bilateral vesico-ureteral reflux and neurogenic reactive bladder.

The patient was referred for a bone scan because of osteoarticular complaints, especially at the elbows with limited mobility, and he reported mild and nonspecific symptoms, especially no significant dyspnea.

Patient had high creatinine (428  $\mu\text{mol/l}$ ); serum phosphorus (4.51  $\text{mmol/l}$ ); total alkaline phosphatase, 108 U/L and serum parathyroid hormone level was 1700  $\text{pg/mL}$ .

Whole body bone scintigraphy images [Figure 1], showed a diffuse uptake in both lungs, more intense in the right one, suggesting an extra-osseous pulmonary calcification and an increased radiotracer uptake in the soft tissues of the left arm and in the periarticular soft tissues surrounding the elbows. The chest X-ray was normal [Figure 2].

Parathyroidectomy was declined by the patient. The medical therapeutic was chosen with dietary phosphorus restriction, noncalcium phosphate binders, calcimimetics, optimal control of secondary hyperparathyroidism, and intensive hemodialysis with a low-calcium dialysate.



**Figure 1:** Whole body bone scintigraphy with anterior and posterior projection performed 2 h after the injection of 18 mCi (666 MBq) of  $^{99\text{m}}\text{Tc}$ -methylene diphosphonate which showed a diffuse uptake in both lungs and an increased radiotracer uptake in the soft tissues of the left arm and in the periarticular soft tissues surrounding the elbows (the hand positions are due to the limited mobility of the elbows)

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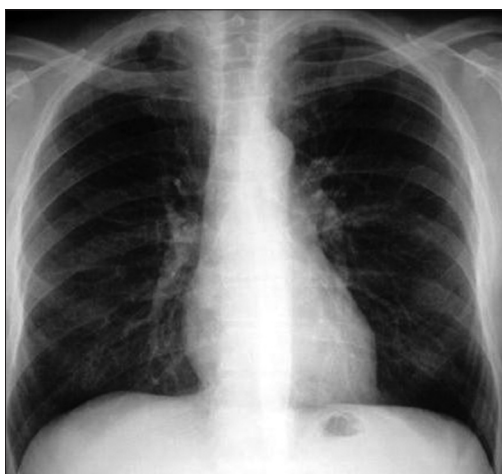
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**Figure 2:** Chest radiograph performed in the light of the data of bone scan

Second bone scan was done 3 months later [Figure 3] revealed a significant decrease, without disappearance, in the lung's uptake.

## DISCUSSION

Soft-tissue calcification is a well-known complication of chronic renal failure. Calcified deposits may involve a variety of tissues and organs. Uremic tumoral calcinosis predominates in periarticular soft tissues with preservation of the bone and joint structures.<sup>[1]</sup> Several cases of metastatic pulmonary calcification (MPC) have been reported.<sup>[2]</sup> The clinical symptoms of MPC are usually mild<sup>[3]</sup> that's why this pathology is rarely diagnosed<sup>[4]</sup> and patients with extensive calcification may be asymptomatic.<sup>[5]</sup> Chest X-ray findings in MPC are nonspecific<sup>[6,7]</sup> and they are frequently normal.<sup>[8]</sup>

The diagnosis is confirmed by biopsy, but can be suspected by typical findings on a Tc-99m-methylene diphosphonate bone scan, which is a sensitive and specific method for diagnosing.<sup>[8,9]</sup> That why, some authors have recommended the use of bone scan in hemodialysis patients with pulmonary symptoms.<sup>[4]</sup> Lungs affected by MPC demonstrate increased uptake, generally symmetrical.<sup>[5,10]</sup>

Four major predisposing factors may contribute to MPC in dialysis patients. First, chronic acidosis leaches calcium from bone. Second, intermittent alkalosis favors the deposition of calcium salts. Third, hyperparathyroidism tends to cause bone resorption and intracellular hypercalcemia. Finally, low glomerular filtration rate can cause hyperphosphatemia and an elevated calcium-phosphorus product.<sup>[8]</sup>

For patients with hyperparathyroidism, correction of this condition may stop the progression of nonvisceral soft-tissue calcification.<sup>[11]</sup> Our patient declined parathyroidectomy and was treated medically with a significant regression of scintigraphic abnormalities.



**Figure 3:** Second whole body bone scintigraphy with anterior and posterior projection performed 2 h after the injection of 18 mCi (666 MBq) of <sup>99m</sup>Tc-methylene diphosphonate revealed a significant decrease in the lungs uptake (the hand positions are due to the limited mobility of the elbows)

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