

CLINICAL IMAGES

Metastatic pulmonary calcification in end-stage renal failure

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Competing interests:

Nadim Srour has received personal fees from Grifols, Boehringer Ingelheim and Forest Laboratories for activities unrelated to this work. No other competing interests were declared.

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A 37-year-old man with progressive chronic renal failure (which started in the first year after a kidney transplant 15 years earlier) presented for evaluation of a nonproductive cough. There was no history of dyspnea. The patient was taking calcitriol, prednisone, cyclosporine and azathioprine.

Chest radiography (Figure 1) and thoracic computed tomography (CT) (Appendix 1, available at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.150778/-/DC1) showed extensive ground glass opacities. Bone scintigraphy showed abnormal diffuse pulmonary uptake. Pulmonary function tests showed low-normal lung volumes, with moderately reduced diffusion capacity. Laboratory testing showed calcium 2.52 (normal 2.12–2.52) mmol/L, phosphate 1.65 (normal 0.80–1.58) mmol/L and parathyroid hormone 23.2 (normal 1.6–9.3) pmol/L. Metastatic pulmonary calcification was diagnosed on the basis of the history and imaging. Peritoneal dialysis was started and the patient then underwent kidney transplantation. His cough resolved, and diffusion capacity improved.

Metastatic pulmonary calcification is present in 60%–75% of patients with chronic renal failure on autopsy.¹ However, it is underrecognized and seldom diagnosed, because chest radiography is not sensitive enough to detect it, and most patients are asymptomatic.² The condition is due to deposition of calcium–phosphate products.² Among those who have symptoms, the manifestations can include progressive dyspnea, hypoxemia, hemoptysis and, rarely, alveolar hemorrhage and fulminant respiratory insufficiency.³

The differential diagnosis includes end-stage renal disease, malignancies (such as multiple myeloma) and dystrophic pulmonary calcification (Appendix 2, available at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.150778/-/DC1).^{3,4}

High-resolution CT typically shows poorly defined centrilobular nodules with ground glass opacities 3–10 mm in diameter.² CT detects existing calcium deposits that may be inactive, whereas bone scintigraphy identifies areas of active calcium deposition.² Pulmonary function tests often yield

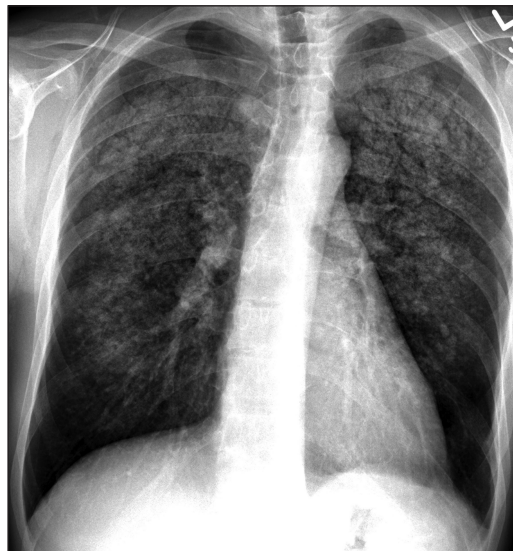


Figure 1: Chest radiograph of a 37-year-old man with chronic renal failure and nonproductive cough, showing ground glass opacities.

normal results, but may show reduced diffusion capacity and a restrictive pattern.³

The optimal treatment for metastatic pulmonary calcification remains unknown. Patients with asymptomatic nonprogressive disease may not need any intervention. The mainstay of therapy is normalization of calcium and phosphate biochemistry.³ It is unclear whether vitamin D supplementation should be discontinued.³ An increase in the frequency of hemodialysis is generally indicated.³ Renal transplantation may be considered for eligible patients. Some authors have reported reduction in calcification, but there are also reports of dramatic worsening after transplant.³

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