

# Multiple bilateral pulmonary cement emboli

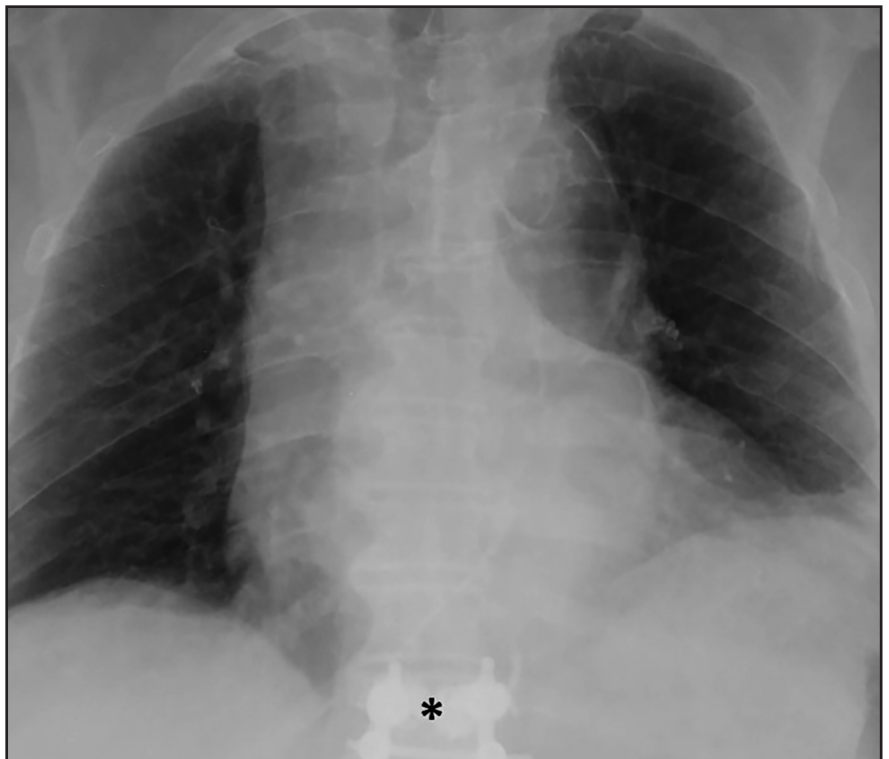
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## CASE SUMMARY

An 80-year-old man presented to the emergency department complaining of three days' history of shortness of breath. He presented with immobilization due to a thoracic arthrodesis performed three months previously, but did not show any other relevant signs or symptoms. The electrocardiography and cardiac markers were normal, and remaining laboratory tests showed no abnormalities except for a d-dimer level of 6110 ng/ml.

## IMAGING FINDINGS

A conventional chest X-ray revealed the thoracic arthrodesis (black asterisk, Figure 1), but no acute cardiopulmonary disease. A subsequent computed tomography pulmonary angiography (CTPA) to rule out a pulmonary embolism revealed no hypodense filling defects of the pulmonary arteries. However, the study showed the presence of high-density (around 1000 HU) material, similar to cement, inside the main left pulmonary artery (white arrow, Figure 2A) and inside several bilateral segmental and subsegmental pulmonary arteries (white arrows, Figure 2B).



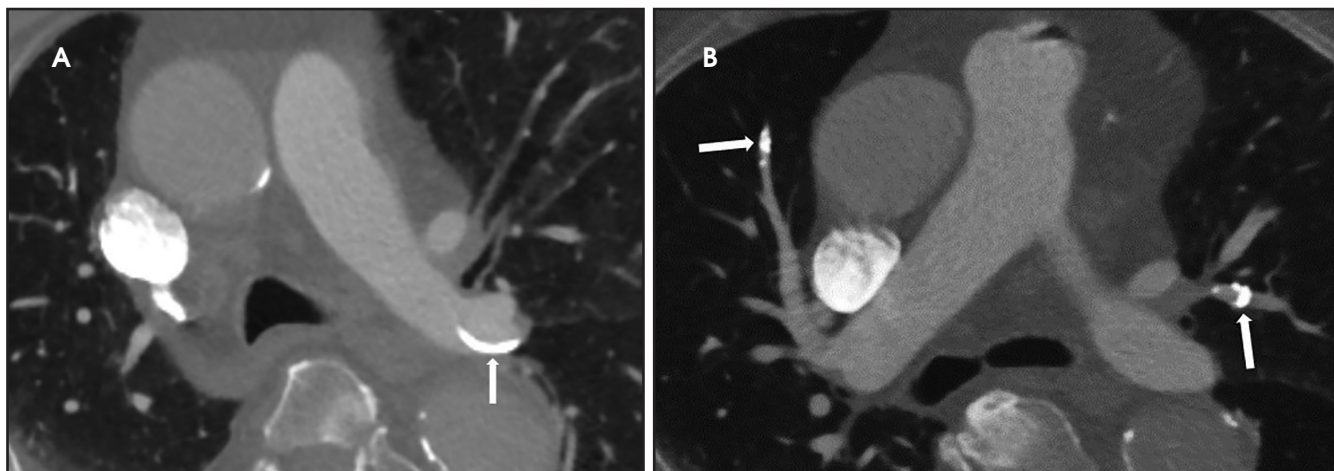
**FIGURE 1.** A conventional chest x-ray reveals thoracic arthrodesis (black asterisk) but no acute cardiopulmonary disease.

## DIAGNOSIS

Multiple bilateral pulmonary cement emboli

## DISCUSSION

Pulmonary cement emboli constitute a frequent complication in



**FIGURE 2.** Computed tomography pulmonary angiography (CTPA) reveals high-density (around 1000 HU) material, similar to cement, inside main left pulmonary artery (A, white arrow) and inside several bilateral segmental and subsegmental pulmonary arteries (B, white arrows).

patients who undergo percutaneous vertebral cementation techniques, usually vertebroplasty and kyphoplasty, with a reported incidence of 20-25% of all procedures,<sup>1,2,3</sup> even though the exact rate at which cement embolizes to the lungs is unknown because patients are not routinely screened with chest imaging before and after the procedure.<sup>3</sup> This phenomenon occurs due to the leakage of polymethyl methacrylate (PMMA) cement (a rapidly setting bone cement injected under fluoroscopic or CT guidance),<sup>3</sup> through the vertebral venous plexus when injected in an extremely liquid state or by applying excessive pressure, leading to cement migration through the inferior vena cava and the azygos system to finally reach the pulmonary circulation (pulmonary arteries).<sup>1</sup>

The condition may produce symptoms similar to those of thrombotic embolisms (such as dyspnea, tachypnea or chest pain), which may appear immediately or several months after the cementation procedure, even though most patients with pulmonary cement emboli remain asymptomatic.<sup>3,4</sup>

On chest X-ray, pulmonary cement

embolisms may sometimes appear as linear high-density opacities that follow the pulmonary vessels. However, CTPA is the modality of choice for detecting pulmonary cement embolisms; occupation of the pulmonary arteries by extremely dense material compatible with cement makes the diagnosis.<sup>2,4,5</sup>

Treatment is controversial, although it is generally the same as for thrombotic embolisms: reperfusion procedures, mainly embolectomy when unstable, and anticoagulation therapy if not.<sup>1</sup> Our patient was not treated with anticoagulant therapy because of the high risk of bleeding (he had an abdominal aortic aneurysm of 6.5 cm). However, he experienced complete resolution of the symptoms.

## CONCLUSION

Pulmonary cement embolisms are a frequent complication of vertebral cement placement procedures; diagnosis is made by CTPA. Both radiologists and other physicians should consider this entity in all patients with cardiopulmonary symptoms and a previous history of arthrodesis.

## REFERENCES

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