Connecting the shiny dots: Cardiopulmonary cement embolization after vertebroplasty for traumatic fracture

Anant Jain MD, Oleg Epelbaum MD

Case

A 58-year-old woman underwent thoracolumbar fusion for a traumatic vertebral burst fracture; surgery included vertebroplasty by means of cement augmentation with polymethylmethacrylate (PMMA). Computed tomography (CT) of the spine performed two years postoperatively identified linear paraspinal hyperdense opacities suspicious for malpositioned cement material (Figure 1, Panel A). Subsequent chest

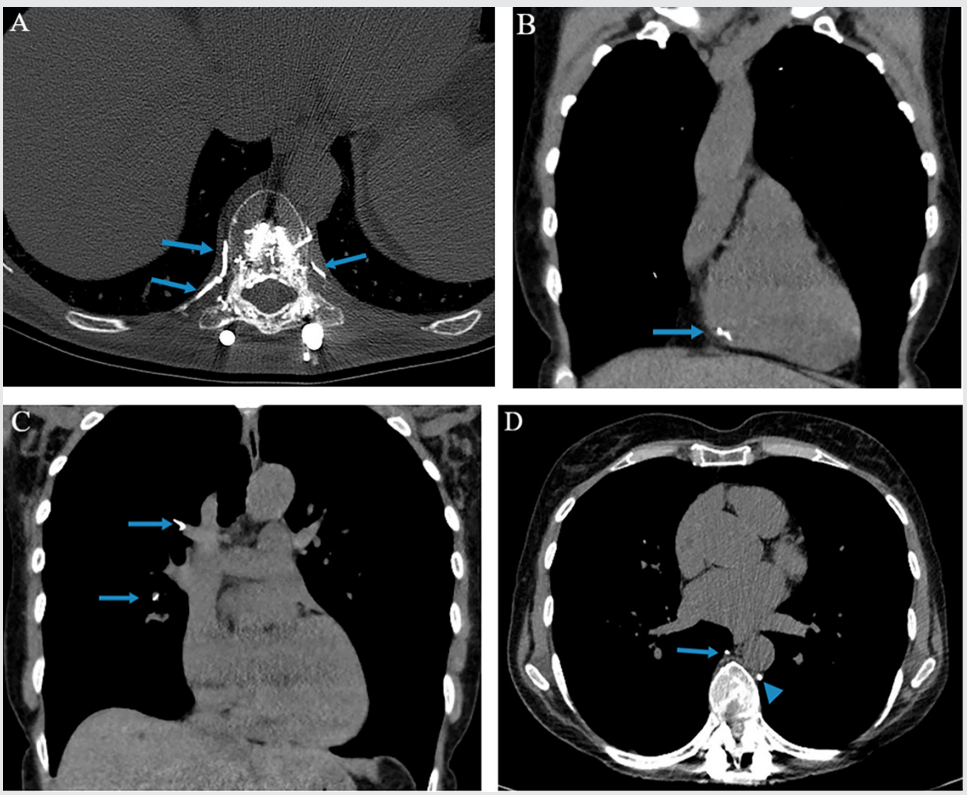

Figure 1. Panel A: Computed tomography of the thoracolumbar spine showing linearly shaped extremely hyperdense material at the T10 level consistent with paraspinal migration of vertebral cement (arrows). **Panel B:** Coronal reconstruction from computed tomography of the chest without intravenous contrast showing similar material as in Panel A located along the free wall of the right ventricle (arrow). **Panel C:** Coronal reconstruction from computed tomography of the chest at a different level than the one in Panel B showing the hyperdense material in right pulmonary arterial branches. **Panel D:** Axial section from chest computed tomography showing the same hyperdense material as seen in Panels A–C also located along the course of the azygos (arrow) and hemiazygos (arrowhead) veins.

Corresponding author: **Oleg Epelbaum**
Contact Information: Oleg.Epelbaum@wmchealth.org
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CT demonstrated high-density foci along the right ventricular free wall consistent with adherent cement (Figure 1, Panel B). There were numerous hyperdensities in the pulmonary arterial branches signifying cement emboli (Figure 1, Panel C). Similar hyperdensities were present in the azygous and hemiazygos veins (Figure 1, Panel D). The patient was asymptomatic and had a normal echocardiogram so her clinicians elected observation.

Discussion

Cement embolization is an example of non-thrombotic pulmonary artery embolism. Its incidence following vertebral procedures has been reported to be as high as 26%,[1] though detection of concurrent intracardiac cement as illustrated by the present case is much less common at approximately 3%.[2] Entry of ectopic PMMA into the right heart is believed to occur by way of the paravertebral venous drainage into the azygos and hemiazygos veins and from there into the superior vena cava. Detection could be incidental or due to symptoms typical of thrombotic pulmonary embolism. Anticoagulation is considered for peripheral symptomatic and central asymptomatic emboli; central symptomatic emboli could warrant embolectomy.[3]

Keywords: Pulmonary embolism; vertebroplasty; cyanoacrylates; cement; chest computed tomography

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From: Division of Pulmonary, Critical Care, and Sleep Medicine, Westchester Medical Center, Valhalla, NY, USA (AJ, OE)
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