CASE

A 76-year-old man with a history of severe chronic obstructive lung disease on 2 L home oxygen, former smoker with 40 pack-years (quit in 2005), atrial fibrillation, and right lower lobe non-small cell lung cancer (T1aN0M0, Stage IA) status post cyber knife therapy in 2016 presented with chief complaint of lower back pain. Patients lung cancer recurred in 2017 with positive station 7 lymph node and received chemo-radiation. Magnetic resonance imaging (MRI) showed benign burst fractures of T8 and T9 vertebrae. He had kyphoplasty of T7, 8, and 9 vertebrae. During kyphoplasty, following complications were noted [Figures 1 and 2].

QUESTIONS

1. What is the abnormality detected on fluoroscopy and computed tomography (CT) chest during the procedure [Figures 1 and 2]?
and series, at least 3–6 months of anticoagulation is recommended to avoid additional thrombosis and to give time for the cement to endothelialized which might prevent progression of the occlusion. Our patient was admitted overnight for observation. Follow-up CT chest showed stable azygos vein cement embolism; therefore, he was discharged home on apixaban which was also indicated for atrial fibrillation.

To give a general recommendation for avoiding cement embolisms, the bone cement used should have a viscous, toothpaste-like consistency. There is hard evidence in the experimental work that viscosity of the bone cement is one crucial parameter regarding the risk for leakage. The injection should be stopped as soon as one of the personnel present during the procedure realizes that there is paravertebral or intravenous cement extravasation. Both kyphoplasty and vertebroplasty procedures should be done under fluoroscopy or CT monitoring by experienced proceduralists. Routine chest radiograph following every vertebroplasty is recommended to prevent serious delayed cardiopulmonary complications.

The risk for PCE seems to be higher in vertebroplasty than in kyphoplasty and in the treatment of some malignant lesions because of more frequent cortical destruction of the vertebral body and higher vascularization associated with some malignant tumors. Some authors reported the use of a preinjection venogram and injection of sclerosing agents into the vertebral body before vertebroplasty to close the venous channels to prevent (or reduce the risk of) this complication.

Follow-up
Repeat CT chest after 1 month showed progression of his right lower lobe lung cancer, mild progression of cement into superior vena cava and focal discontinuity proximally. He was scheduled for cement retrieval with moderate sedation through internal jugular approach. However, given the progression of his lung cancer, while on immunotherapy (Durvalumab), he opted for hospice care.

Take home points
1. Although rare, PCE is a life-threatening complication and should be in differential diagnosis in patients presenting with worsening respiratory symptoms after vertebroplasty or kyphoplasty procedure
2. Routine chest radiograph should be obtained following all vertebroplasty and kyphoplasty to prevent serious delayed cardiopulmonary complications
3. Noncontrast CT chest is the imaging of choice to diagnose PCE
4. Treatment depends on the symptoms and location of PCE. Therapeutic anticoagulation for 3–6 months is recommended to avoid additional thrombosis and to give time for the cement to endothelialized which might prevent the progression of the occlusion.
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Conflicts of interest
There are no conflicts of interest.

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