Case report

A rare case of pulmonary cement embolism in a lung transplant patient

Atif S. Siddiquia,∗, Ahmad Goodarzib, Tilottama Majumdar, Thomas Kaleekal

a Division of Pulmonary and Critical Care, Houston Methodist Hospital, Houston, TX 6565 Fannin St, Houston, TX 77030, USA
b Division of Pulmonary Transplant, Houston Methodist Hospital, Houston, TX 6565 Fannin St, Houston, TX 77030, USA

ABSTRACT

Pulmonary cement embolism (PCE) is a complication of percutaneous vertebral augmentation techniques. PCE in lung transplant patient population has not been reported. We report a case 57-year-old male patient with double lung transplant secondary to idiopathic pulmonary fibrosis presented with shortness of breath after vertebroplasty. CTA chest showed thin dense opacities within the bilateral pulmonary arteries consistent with pulmonary cement embolism. The patient was treated with therapeutic enoxaparin and remained stable at one year follow up.

1. Case report

A 57-year-old male presented with shortness of breath of one-day duration. He denied cough, wheezing and chest pain. His medical problems were significant for double lung transplant secondary to idiopathic pulmonary fibrosis and chronic back pain secondary to chronic vertebral compression fractures. His medications included mycophenolate, tacrolimus and prednisone. He had vertebroplasty of lower thoracic and upper lumbar vertebrae one day prior to his presentation. Vital signs were: blood pressure 140/80 mm Hg, heart rate 110, respiratory rate 18, temperature 99.8 F, oxyhemoglobin saturation 90% on room air. Chest was clear on auscultation. Cardiovascular exam was remarkable for sinus tachycardia. Physical exam was otherwise normal. Laboratory data showed normal chemistries and cell count. Tacrolimus level was 10 ng/ml. EKG showed sinus tachycardia. Cardiac enzymes were normal. Doppler venous ultrasound of lower extremities was normal. Echocardiogram was normal.

CTA chest showed thin dense opacities within the distal main right pulmonary artery extending into subsegmental branches of right pulmonary artery and thin dense opacities in distal main left pulmonary artery extending into subsegmental branches of left pulmonary artery consistent with pulmonary cement embolism (Fig. 1). The patient was treated with therapeutic enoxaparin and he remained hemodynamically stable. He was discharged on enoxaparin for three months to prevent thrombosis around cement. Patient remained without symptoms at 3 months, 6 months and 1 year follow up. Echocardiogram at 3 months follow up showed EF of 55%–60%, normal RV function and estimated PASP of 28 mmHg. CT scan chest at 1 year follow up showed stable thin dense opacities without any progression of cement embolism (see Fig. 2).

2. Discussion

Percutaneous vertebral augmentation techniques are minimally invasive imaging-guided procedures for treating osteoporotic vertebral fractures. It involves injection of polymethylmethacrylate (PMMA) into a vertebral body lesion. PMMA can extravasate into the vertebral venous plexus and subsequently migrate to the inferior vena cava and pulmonary arterial system [1]. PCE is a complication of percutaneous vertebral augmentation techniques, with rates ranging between 3.5% and 23% [2]. Risk factors include insufficient polymerization of the PMMA at the time of the injection which allows its migration into the venous system. Most of the patients with this complication remain asymptomatic, however 0.4%–0.9% of the cases can be symptomatic [3]. Common symptoms include dyspnea, tachypnea, tachycardia, cyanosis, chest pain, cough and hemoptysis. Diagnosis is usually made by Chest X ray or CT scan. However, there is no literature to support routine screening for cement pulmonary embolism during the post-operative period. No treatment is needed in asymptomatic patients with PCE [4]. Medical management in symptomatic patients include anti-coagulation for 3 months after which foreign material is usually endo-thelialized which limits the progression of thrombosis [5]. Pulmonary embolectomy needs to be considered in patients with symptomatic central embolism and hemodynamically unstable patients.

∗ Corresponding author.
E-mail address: atifsaleem19@houstonmethodist.org (A.S. Siddiqui).

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[6]. PCE can cause increase in pulmonary artery pressures and can lead to pulmonary hypertension and RV dysfunction. RVSP and RV function remained normal in our patient at 3 months and 1 year follow up. Strategies to reduce the risk of PCE include limiting injected mass to 4–6 ml of PMMA per vertebral body, using greater caution when performing multilevel procedures and in highly vascular lesions, PMMA material should have a viscous, toothpaste-like consistency before injection, use of a pre-injection venogram, injection of sclerosing agents into the vertebral body before vertebroplasty. Lung transplant patients are usually on corticosteroids for prevention of chronic allograft dysfunction and develops osteoporosis of vertebrae requiring vertebroplasty. Clinicians should consider PCE in the differential diagnosis of patients who present with shortness of breath after percutaneous vertebroplasty augmentation techniques.

**Statement of contribution and disclaimer**

All authors contributed to conception, literature review, drafting and final approval of the version to be published and in agreement to be accountable for all aspects of this work. The views expressed in this article do not communicate an official position of institution. All authors have no conflict of interest.

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Fig. 1. CTA chest showing bilateral pulmonary cement embolism in proximal and distal pulmonary arteries.

Fig. 2. CT chest at one year follow up showed stable bilateral thin dense opacities in proximal and distal pulmonary arteries consistent with stable pulmonary cement embolism.