



Research Article

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## Hemothorax after Kyphoplasty: A Case Report

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### Abstract

Percutaneous vertebroplasty and kyphoplasty are commonly performed procedures with a relatively low complication rate. The reported complication rate is around 1%. Typical events are secondary to cement migration with resultant compromise of neighboring neurologic structures or embolic events. Additionally, the procedure can result in vertebral body fractures, rib fractures and pneumothorax. We present a case of a hemothorax secondary to a kyphoplasty.

### Keywords

Kyphoplasty; Compression fracture; Thoracic

### Introduction

Percutaneous vertebroplasty and kyphoplasty are commonly used procedures for the treatment of osteoporotic vertebral body compression fractures, metastatic disease to the spine and multiple myeloma [1]. The procedures are not without controversy, although there are multiple retrospective and prospective studies that show they reduce pain and improve quality of life [1-9]. The procedure, done under live fluoroscopic guidance, involves placing a trocar through the pedicle into the vertebral body. In kyphoplasty, but not vertebroplasty, a balloon is then inserted and inflated to create a cavity. Cement, again under live fluoroscopy, is injected into the vertebral body [1,10,11].

These are relatively safe procedures. Major adverse effects have been reported in 0.1-1.0% of patients [1,7,10-12]. We present here the first reported case of a hemothorax following a kyphoplasty.

### Case Presentation

A 73 year old female with PMH of advanced COPD presented two weeks after sustaining a fall and experiencing an immediate onset of mid-back pain. She had no other significant past medical history and was not on anticoagulation. She denied any recent NSAID use. She sought medical attention for the increasing pain and a routine CXR performed in the emergency department demonstrated a T10 anterior wedge compression fracture with 75% loss of vertebral body height. MRI further characterized it as a late subacute fracture with mild marrow edema and a 5mm protrusion into the canal that did not deform the cord (Figures 1 and 2).

The patient underwent a kyphoplasty the next day. Briefly, a unilateral stab incision was made over the left T10 pedicle. The

introducer was placed near the pedicle, using biplanar fluoroscopy as guidance. During the localization of the pedicle, the introducer was felt to slip off the superior portion of the transverse process, however, it did not plunge into the soft tissue and the procedure continued. The introducer was placed into the pedicle, the balloon was placed, inflated, deflated and removed (Figure 3). The cavity was filled with cement and no extravasation was noted. The cement was noted to fill across midline and, once it was given time to firm, the cannulas were removed. The patient tolerated the procedure well, had improvement in her pain, and was discharged the next day.

Six days later the patient presented with shortness of breath. It was worse with deep breathing but it improved with increasing her home O<sub>2</sub>. She had also been having left lateral chest pain since the procedure. A CXR done in the ED showed a new moderate left lower lung effusion. A thoracentesis was performed and 600ml of bloody pleural fluid was removed. This was sent for cell count, pathology and culture. It was found to be negative for malignancy or infection. The effusion did not re-accumulate. She had a left lower lobe infiltrate and was given a course of levofloxacin for that as well as 2U PRBC for anemia. Her stay was complicated by hypokalemia and abdominal pain, but these were found to be unrelated to the procedure. She was discharged after a six-day hospitalization and has had no further effects from the hemothorax.

### Discussion

Percutaneous vertebroplasty and kyphoplasty are relatively safe and effective procedures. However, they are not without risk of complications. The biggest risk is that of cement extravasation into neighboring structures. This can cause paralysis from cement intrusion into the cord or spinal canal, radiculopathy from cement in the foramen and fatal emboli from cement entering the vasculature or heart [12-17]. In addition, the procedural complications have included air embolism, vertebral body split fracture, pneumothorax and rib fractures [11,12,18,19]. Our case of a hemothorax secondary to kyphoplasty is the first one described in the literature.

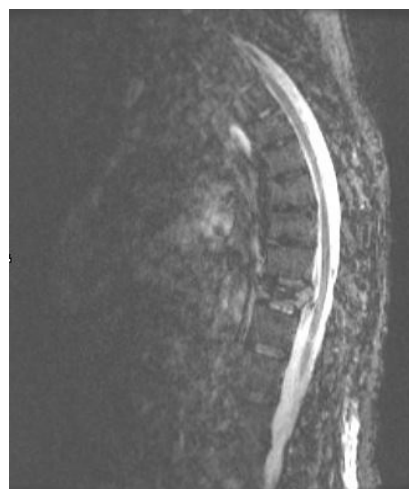


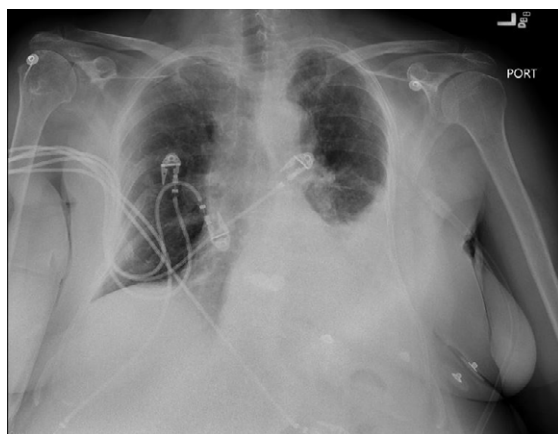
Figure 1: Sagittal MRI, STIR sequence of the thoracic spine, showing acute compression fracture of T10.

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**Figure 2:** Sagittal MRI, T2 sequence of the thoracic spine, showing acute compression fracture of T10.



**Figure 3:** Anterior-posterior portable chest x-ray showing left hemothorax.

In retrospect, it is possible to speculate on the moment of injury that caused the hemothorax. The slip of the trochanter while marching down the rib to the transverse process was the likely inciting event. However, as this occurred off the superior portion of the rib, it is unlikely that the neurovascular bundle was damaged. A direct injury was never found and the patient did not need further thoracentesis.

The potential morbidity from this injury cannot be overstated, however. Hemothorax in the elderly can be a very serious condition. The most common sequelae from posttraumatic hemothorax is the development of empyema, which occurs in approximately 26% of patients [20].

Thankfully our case resolved without the patient requiring any more intervention aside from the single thoracentesis. It does emphasize that physicians need to be mindful of surrounding anatomy during these percutaneous procedures. Vigilance with constant attention to the live fluoroscopy is essential, along with small, controlled movements. Postoperatively, the development of any pulmonary symptoms after a percutaneous kyphoplasty should put hemothorax or pneumothorax high on the differential diagnosis.

## Disclosures

The authors DiGiorgio, Conger, Fannin, and Steck declare there are no conflicts of interest. This paper has not been previously presented or published.

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