Iatrogenic Pneumothorax with Subsequent Subcutaneous Emphysema

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INTRODUCTION

Lung cancer is the leading cause of cancer-related death in the United States, accounting for 13% of all new cancer diagnoses and 24% of all cancer deaths.1 Transthoracic CT-guided biopsy (CTGB) is commonly used as a diagnostic tool for lung cancer, with high diagnostic accuracy, sensitivity, and specificity.2 This procedure, however, is not without its risks which include pulmonary hemorrhage and iatrogenic pneumothorax (IPNX). Emergent chest tube placement is standard care of treatment for massive or symptomatic IPNX, commonly with the use of smaller caliber chest tubes.2 There is, however, a growing discussion over use of larger caliber chest tubes in select patients who may pose a greater risk of developing subcutaneous emphysema (SE).5 We discuss a case of a patient with underlying lung mass who underwent GTGB and developed IPNX with subsequent SE.

CASE REPORT

Patient is 67-year-old former smoker who presented to the emergency department with hemoptysis and shortness of breath of two weeks duration. During the workup, a left lung mass measuring 5.7 x 5.6 cm was identified and a CTGB was planned. During the biopsy, the patient became short of breath and was noted to have developed an IPNX. The procedure was aborted and a 12-french chest tube was placed with resolution of symptoms. After a successful second CTGB attempt the following day, the patient developed odynophagia and thoracic subcutaneous crepitus consistent with SE. He readily intubated for airway protection. Over the next two days, the SE progressed to involve the entirety of thorax and bilateral neck. At this point, a larger caliber chest tube was exchanged for the initial smaller one to help create a better sealant between IPNX and subcutaneous tissue where free air was accumulating. Over the course of two days, the SE was resolving and the patient was successfully extubated with complete resolution of respiratory symptoms. IPNX had also resolved and chest tube was removed without complication.

DISCUSSION

IPNX is the most commonly encountered complication of CTGB of the lung with an incidence rate of 17-30%. Of such cases, 14-29% require chest tube placement.3 Certain patient risk factors increase the incidence of IPNX including advanced age, COPD, and smoking. Other risk factors include needle path to the lesion >4 cm, lesion location (worse in parenchyma vs. lung pleura), needle angle, increased number of pleural punctures, supine position and smaller lesion size.3 Thoracic SE is often a sequelae of an underlying thoracic conditions such as trauma, infection, or is iatrogenic in nature. Although alarming in appearance, SE typically follows a benign course and is often self resolving. Rarely, SE may lead to life-threatening complications such as upper airway collapse and vasculature compromise.5 Treatment of symptomatic IPNX is with emergent placement of chest tube. There has been a growing discussion for the use of larger caliber chest tubes (greater than 14-french) versus the more commonly used smaller sized ones in all types of pneumothorax.3 A number of studies have illustrated better success rates with the use of larger caliber chest tubes in patients with on-going air leaks and IPNX associated with malignancy as this may provide a greater air sealant.5, 6 In the presented case, it is likely that the SE developed as a sequelae of air leakage from IPNX into subcutaneous tissue. The initial smaller chest tube used did not aide in providing a good sealant and may have served as a conduit for continued air leakage into the subcutaneous tissue. Given patient’s risk factors, it may have been beneficial to consider earlier placement of a larger chest tube which could have provided a better air sealant and decrease the extensiveness of SE or prevented it all together.

References


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