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**CASE OF THE MONTH** Bishnu Devkota MBBS, MHI, FRCS & Yashaswini Yeragunta MD

### **DELAYED PRESENTATION OF PRIMARY SPONTANEOUS PNEUMOTHORAX**

**ABSTRACT:** Primary spontaneous pneumothorax occurs when there is an accumulation of air in the pleural space without a history of trauma or an underlying medical disorder. It is usually seen in young individuals with a history of tobacco use. The clinical presentation is most often acute with chest pain and/or dyspnea; however, some patients have a delayed presentation. We present a case of primary spontaneous pneumothorax with delayed presentation and discuss the management of this condition and issues related to the prevention of its recurrence. The role of the hospitalist in patient education is emphasized since counseling during hospitalization for an acute illness is the most effective means to discourage continued tobacco use.

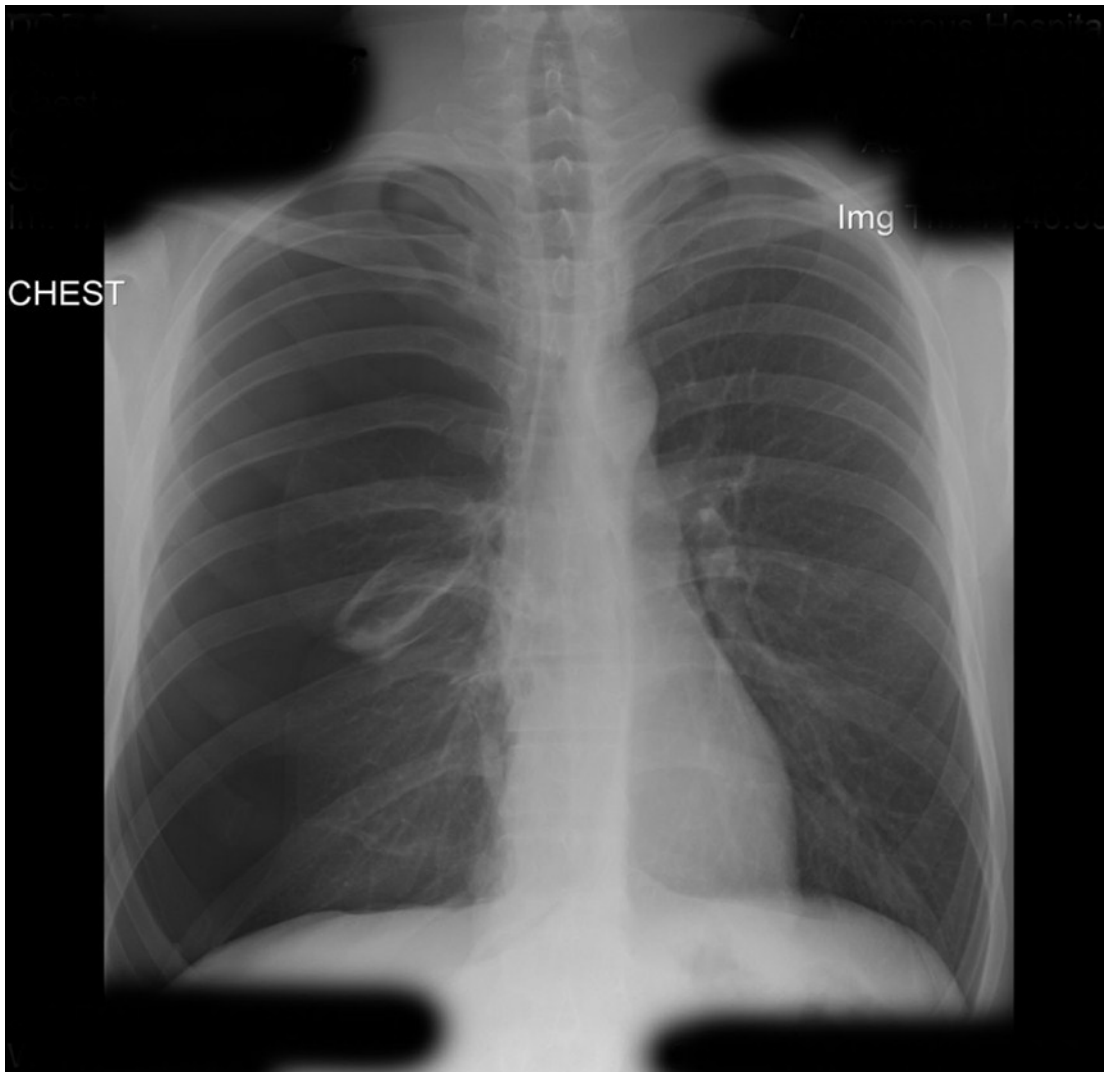
**CASE REPORT:** A 35 year old Caucasian male presented with a three week history of shortness of breath; the onset was sudden, while working in his yard, and was accompanied by sharp, right-sided chest pain. While the pain subsided, the dyspnea gradually worsened and he sought medical attention. His medical history included depression, neonatal endocarditis and tobacco use for 20 years. Medications included lamictal, Paxil and Ambien. Exam was remarkable for a displaced PMI in the left 7th intercostal space at the anterior axillary line; the trachea was displaced to the left, percussion revealed hyperresonance over the right lung and decreased breath sounds were heard on the right side. A CXR revealed a large pneumothorax (see image on next page).

The patient was admitted to the hospital and a chest tube was inserted in the right 5th intercostal space; this tube was connected to a water seal drainage system. A followup film revealed resolution of the pneumothorax and the patient was discharged to home after counseling for smoking cessation. Another CXR, obtained in the Pulmonary Clinic two weeks later, was also normal, with no recurrence of the pneumothorax.

**DISCUSSION:** Pneumothorax is classified as spontaneous, traumatic or iatrogenic. Spontaneous pneumothorax may be primary (no underlying lung disease) or secondary (related to underlying lung disease).

Primary spontaneous pneumothorax (PSP) has an estimated incidence between 7.4 and 18 cases per 100,000 men and between 1.2 and 6 cases per 100,000 women. It typically occurs in tall, thin males between the ages of 10 and 30 and rarely occurs over the age of 40 [1,2]. Cigarette smoking increases the risk of PSP in men by a factor up to 20, in a dose-dependent manner [2]. Wakai reports that smoking increases the risk by a factor of 22 in men and 8 in women [3]. A study in Sweden showed that cigarette smoking increased the risk by a factor of 22 in men and 9 in women and demonstrated a striking, statistically significant ( $p < 0.001$ ) dose-dependent relationship between tobacco use and the occurrence of PSP [4]. This study also reported that persons with a life-long history of heavy tobacco use have a 12% incidence of PSP vs an incidence of 1/1000 among those who have never smoked. In non-smokers, one should inquire about a family history of PSP; this is seen with Birt-Hogg-Dube syndrome, (cont)

Rise



(cont) a rare autosomal dominant condition characterized by benign tumors of the hair follicle, renal cancer, pulmonary cysts and spontaneous pneumothorax [5].

Most episodes of PSP occur while the patient is at rest. Virtually all patients have ipsilateral pleuritic chest pain and/or acute dyspnea. Chest pain may be minimal or severe and is often described as sharp at the time of onset, becoming a steady ache as time passes. Symptoms may resolve within 24 hours, even if the pneumothorax has not resolved. In our patient, his initial chest pain resolved but dyspnea persisted, prompting his presentation to the Urgent Care Center; tobacco use was presumed to be responsible for his spontaneous pneumothorax.

Management of PSP continues to challenge physicians; recent guidelines recommend care pathways but also highlight the areas in need of additional study [6]. Treatment of primary and secondary spontaneous pneumothorax has been heterogeneous in the United States [7] and depends on the clinical status of the patient. Observation of patients with a small pneumothorax is appropriate but only if it is a PSP [8]. Pleural air drainage may be performed with simple aspiration or chest tube placement [9,10]; there is no difference between these procedures with regard to immediate success rate, early failure rate, duration of hospitalization, one year success rate and the need for pleurodesis at one year. Of course, simple aspiration reduces the need for hospitalization when compared to chest tube placement [11]. While death from spontaneous pneumothorax is rare, (continued)

(continued) rates of recurrence are high, with one study in the U.S. finding that recurrence occurred in 35% of male patients. For this reason, the prevention of recurrence is very important, including air leak management and possible surgical intervention [6]. Continued tobacco use increases the risk of pneumothorax recurrence and a recent study by Ganesalingam et al. revealed that 3 or more abnormalities on a CXR (pleural thickening, blebs or bullae, pleural irregularities and pleural adhesions) increased the risk of recurrence by a factor of 12.6 [12]. However, a study by Ouanes-Besbes et al. found that, while dysmorphic lesions (blebs and bullae) may be common in patients with spontaneous pneumothorax, they are not associated with an increased risk of recurrence [9].

In a study published by Cheng et al., in 2009 [13], there was a significant impact of smoking cessation on the recurrence of PSP, even if surgical intervention was necessary (22% vs 57% in those who continued to smoke  $p=.001$  when there was no surgery, 8.9% vs 1.7%,  $p=.02$  in the surgical patients). This same study found that tobacco use is associated with the development of extensive bronchiolitis, which has a significant impact on the recurrence rate of PSP. Therefore, it is important that the hospitalist take part in tobacco cessation counseling; according to the findings of the Tobacco Use and Dependence Guideline Panel, published by the U.S. Department of Health and Human Services in 2008 [14], physician advice to quit smoking increases the success rate from 7.9% to 10.2% and the number and duration of counseling sessions correlated with the level of effectiveness. Whether such an approach can reduce the recurrence of PSP awaits further study.

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