

## Case Report

### A Red Herring to Iatrogenic Pneumothorax

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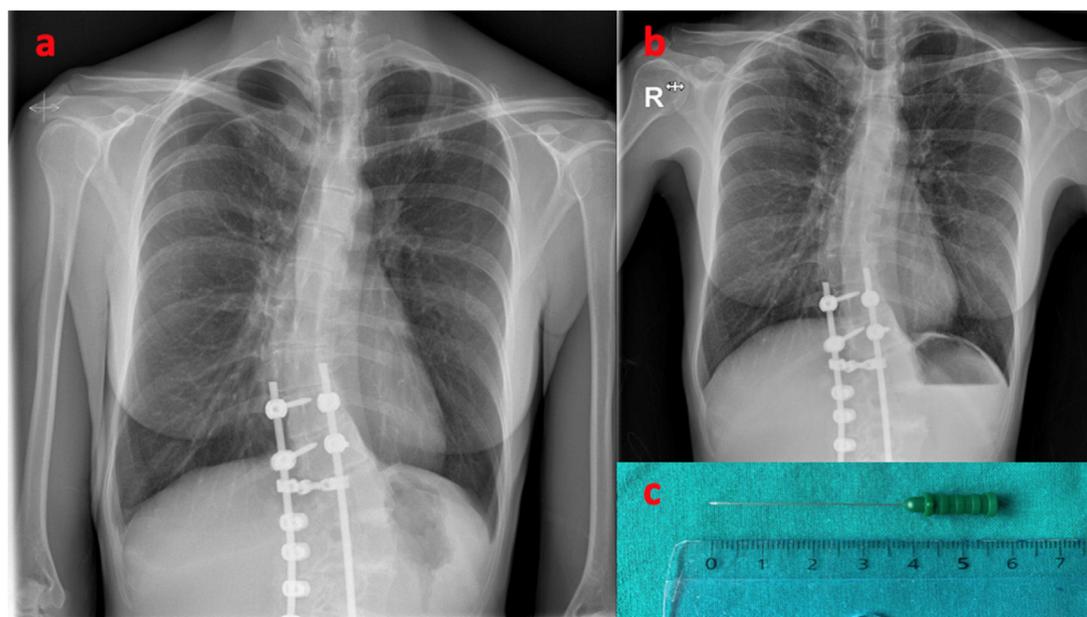


Electromyography (EMG) is a technique that enables recording the electrical activity derived from muscle fibers, obtaining information for the study of neuromuscular disorders. Although considered a safe technique, monitoring through intramuscular needle electrodes carries potential risks, including pain, bleeding, and infection. When needle exploration is performed in muscles adjacent to the pleura, there is a risk of pneumothorax.<sup>1</sup> We present a case of this rare adverse effect, which led to a referral to our center due to a distracting symptom.

A 42-year-old woman with a past medical history of scoliosis surgery was referred from a private center for urgent endoscopy due to suspicion of esophageal impaction. The patient presented

in the emergency department (ED) reporting chest pain in the last 24 h. The pain began suddenly in the right hemithorax associated with mild dyspnea, coinciding with the ingestion of ham and potatoes. After a few minutes, it partially subsided, presenting a pain of less intensity that increased with inspiration, unrelated to swallowing. Upon arrival to the ED, she no longer presented dyspnea, dysphagia or other accompanying symptoms. She added that the previous day she had undergone an EMG in another health center, of which she did not provide a report.

Her vital signs were as follows: blood pressure, 121/81 mmHg; heart rate, 65 bpm; temperature, 36 °C and oxygen saturation 99% on room air. Lung auscultation showed mild hypoventilation in the



**Fig. 1.** (a) Posteroanterior chest radiograph showing grade I pneumothorax in the right lung apex. (b) Follow-up chest radiograph showing complete resolution of the pneumothorax 10 days later. (c) EMG needle used in the examination of the serratus anterior muscle.

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right lung apex, without palpation of subcutaneous emphysema. An ECG showed normal sinus rhythm. The patient's chest X-ray (Fig. 1a) revealed a pneumothorax smaller than 15% in the apex of the right lung. The patient was questioned about the previous day's test, admitting needle puncture of the right periscapular muscle in the electrophysiological examination.

The thoracic surgeon was consulted, who advocated conservative approach with follow-up X-ray at 24 h, showing no increase in pneumothorax. After 10 days, a new chest X-ray was performed (Fig. 1b), verifying radiological resolution. At the follow-up visit, the patient provided an EMG report confirming the exploration of the serratus anterior muscle (Fig. 1c).

The incidence of iatrogenic pneumothorax has recently increased due to the development of invasive procedures for multiple diagnostic and therapeutic purposes.<sup>2–4</sup> Pneumothorax secondary to accidental puncture of the pleura by an EMG needle is a highly infrequent complication. In the study by Kassadjian et al.<sup>5</sup> seven cases of pneumothorax were found out of the 64,490 EMGs that were evaluated. All patients were symptomatic within 24 h of the procedure. Five of them presented a volume equal to or greater than 20%, requiring the placement of a drainage tube. The muscles most associated with pneumothorax under these circumstances are the serratus anterior, rhomboid, and diaphragm.<sup>5</sup> The use of ultrasound-guided punctures allows the correct identification of the muscles and pleural space, and may reduce its incidence.<sup>1</sup>

We highlight the importance of a thorough history and physical examination, especially in patients undergoing invasive diagnostic techniques in the thoracic region, where emergency physicians must consider the possibility of pleural damage as a potentially serious complication.

### Conflict of Interests

Authors declare no conflict of interests for this article.

### References

1. Rubin DI. Needle electromyography: basic concepts. *Handb Clin Neurol*. 2019;160:243–56. <http://dx.doi.org/10.1016/B978-0-444-64032-1.00016-3>.
2. Khan MF, Straub R, Moghaddam SR, Maataoui A, Gurung J, Wagner TOF, et al. Variables affecting the risk of pneumothorax and intrapulmonary hemorrhage in CT-guided transthoracic biopsy. *Eur Radiol*. 2008;18:1356–63.
3. Zhang R, Ying K, Shi L, Zhang L, Zhou L. Combined endobronchial and endoscopic ultrasound-guided fine needle aspiration for mediastinal lymph node staging of lung cancer: a meta-analysis. *Eur J Cancer*. 2013;49:1860–7. <http://dx.doi.org/10.1016/j.ejca.2013.02.008>.
4. Fujii LL, Levy MJ. Basic techniques in endoscopic ultrasound-guided fine needle aspiration for solid lesions: adverse events and avoiding them. *Endosc Ultrasound*. 2014;3:35–45. <http://dx.doi.org/10.4103/2303-9027.123006>.
5. Kassadjian CD, O'gorman CM, Sorenson EJ. The risk of iatrogenic pneumothorax after electromyography. *Muscle Nerve*. 2016;53:518–21. <http://dx.doi.org/10.1002/mus.24883>.