



Unilateral elevation of the lung base

Edson Marchiori¹ , Bruno Hochhegger² , Gláucia Zanetti¹ 

A 65-year-old male smoker (70 pack-years) presented with a 6-month history of irritating cough and weight loss (10 kg). A chest X-ray showed a right perihilar opacity, with elevation of the ipsilateral lung base (Figure 1).

Unilateral elevation of the lung base (UELB) is the most appropriate term to be used in order to describe this abnormality, because X-rays might not eventually reveal the exact position of the diaphragm. UELB may or may not be accompanied by elevation of the diaphragm. In cases in which the diaphragm is in normal position, there is something between the lung base and the diaphragm (most often intrapulmonary pleural effusion).⁽¹⁾

UELB can be due to abdominal causes (e.g., subphrenic abscess, gastric distention, colonic interposition, hepatic masses, etc.); causes related to the diaphragm itself (e.g., diseases related to phrenic nerve paralysis, diaphragmatic eventration, diaphragmatic hernias, or diaphragmatic

tumors); or thoracic causes (e.g., intrapulmonary pleural effusion, pleural masses, and diseases related to decreased lung volume, such as agenesis, hypoplasia, or atelectasis). Clinical and laboratory findings do not normally help much in the differential diagnosis of UELB; which is basically made by imaging.

Although the differential diagnosis of UELB can be easily made by CT, ultrasonography, or magnetic resonance imaging (MRI) in most cases, in some situations, the use of simpler methods, such as conventional X-ray imaging, may be sufficient in providing diagnostic certainty.

Intrapulmonary pleural effusion can be diagnosed by horizontal beam X-ray of the chest with the patient in the lateral decubitus position, which demonstrates mobility of the fluid. Unilateral paralysis of the diaphragm caused by phrenic nerve injury can be diagnosed by X-rays obtained during inspiration and expiration or by dynamic tests, such as ultrasonography or MRI, showing immobility of the hemidiaphragm.

In the case of our patient, right diaphragmatic paralysis was confirmed by dynamic MRI, which also revealed a right perihilar mass. Fiberoptic bronchoscopic biopsy of the mass revealed it to be an adenocarcinoma.

Diaphragmatic paralysis occurs when the phrenic nerve is injured as a result of trauma, systemic disease, or neurological disease, causing loss of control of the hemidiaphragms. Symptoms depend on whether one or both hemidiaphragms are affected, on the onset of the paralysis, and on the presence of an underlying lung disease. The differential diagnosis of acquired diaphragmatic paralysis is broad and includes trauma or compression, as well as neurological, muscular, or inflammatory diseases. Unilateral diaphragmatic paralysis is commonly caused by ipsilateral phrenic nerve injury. Currently, the most common cause of unilateral diaphragmatic paralysis is open heart surgery.⁽²⁾ Another important cause, which was observed in our patient, is phrenic nerve injury due to tumor invasion.



Figure 1. Posteroanterior chest X-ray showing an ill-defined right perihilar opacity, with marked elevation of the ipsilateral lung base.

REFERENCES

1. Souza AS Jr, Souza LVS, Zanetti G, Marchiori E. Solitary fibrous tumor of the pleura: a rare cause of elevation of the right lung base. *J Bras Pneumol.* 2019;45(1):e20180006. <https://doi.org/10.1590/1806-3713/e20180006>
2. Ko MA, Darling GE. Acquired paralysis of the diaphragm. *Thorac Surg Clin.* 2009;19(4):501-510. <https://doi.org/10.1016/j.thorsurg.2009.08.011>

1. Universidade Federal do Rio de Janeiro, Rio de Janeiro (RJ) Brasil.
2. Universidade Federal de Ciências da Saúde de Porto Alegre, Porto Alegre (RS) Brasil.