

## How to reduce pleural drainage complications using an ultrasound-guided technique.

### ***Como reduzir complicações relacionadas à drenagem pleural utilizando uma técnica guiada por ultrassom.***

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#### **LETTER TO THE EDITOR**

The article by Mendes and Hirano<sup>1</sup> addresses a relevant issue in the context of emergency surgery. In fact, complications related to emergency pleural drainage occur in 14% to 25%<sup>2,3</sup> and may range from drain misplacement to lethal iatrogenic lesions<sup>4,5</sup>. Faced with this scenario, the understanding of factors related to the incidence of complications leads to the development of measures and techniques that can reduce this rate. One of the techniques is the ultrasound-guided pleural drainage, which has been standardized by our group and recently published<sup>6</sup>.

Regarding the origin of the complications reported in the article, we consider that anatomical variations and pathological alterations can also result in drainage failure. Although the authors did not observe intercostal artery lesions, this is a common complication reported in literature<sup>7</sup>. The presence of vulnerable vessels in the intercostal space can be excluded, using ultrasound Doppler mode<sup>8</sup>. Some conditions favor iatrogenic lesions during pleural drainage. Atelectasis may result in diaphragmatic dome elevation and diaphragmatic hernias increase the risk of abdominal viscera lesions during drainage<sup>4</sup>. By using ultrasound, it is possible to identify the diaphragmatic excursion and define the safest intercostal space to perform the procedure<sup>6,9</sup>. Thus, drain insertion into the abdominal cavity, observed in two cases<sup>1</sup>, could have been avoided using the echo-guided technique.

Since there is no detailed description of the malpositioning in the article by Mendes and Hirano<sup>1</sup>, we identified three more cases in which the use of ultrasound could have avoided complications. In the case in which there was a gastric perforation, a diaphragmatic hernia, often not observed by digital exploration of the cavity, could have been visualized by ultrasound during an echo-guided pleural drainage. Regarding the two cases of drain placed in the subcutaneous, ultrasound could have prevented complication. With ultrasound, malpositionings quickly identified<sup>10</sup>. Instead of waiting for results of chest X-ray or tomography to confirm positioning, ultrasound allows the physician to promptly identify the necessity of re-drainage.

Obviously, the ultrasound-guided pleural drainage technique has two important limitations. The first is related to resources and lack of training. The other limitation refers to drainage time. Although there are not yet prospective studies comparing the echo-guided technique with the traditional one, it is assumed that the first should take longer.

The medical community is increasingly using ultrasound in emergencies and as an adjunct to invasive procedures. It is necessary that professionals understand the benefits of this tool and the importance of specific training. There are several point-of-care courses in Brazil. To our knowledge, the Discipline of General Surgery and Trauma of Hospital das Clínicas

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- Universidade de São Paulo (HC-FMUSP) offers the only course that teaches the step-by-step ultrasound-guided pleural drainage, developed by our group<sup>6</sup>, in addition to other important topics of ultrasound in emergency medicine.

Thus, we consider that the incorporation of the ultrasound-guided pleural drainage technique may avoid complications currently observed in our medical centers. For this, physicians need to be adequately trained and hospitals must provide the necessary resources to perform the procedure. Similar to other procedures such as thoracentesis and central venous access, in which the echo-guided technique became the gold standard, we believe that the same positive results can be obtained with echo-guided pleural drainage.

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