

Airflow Limitation Appearing as Premature Cycling on Expiratory Flow Waveform

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Short Communication

Patient-ventilator asynchronies are a relevant concern during assisted mechanical ventilation as they can lead to an increased work of breathing and potentially to patient's harm [1]. It is then paramount to rapidly detect and correct them.

A patient-ventilator asynchrony is usually recognized as airway waveforms abnormalities on the ventilator screen in the context of altered respiratory mechanics.

Measuring the activity of respiratory muscles, by monitoring oesophageal pressure (Pes) or the electrical activity of the diaphragm (EAdi), is a great aid in recognizing and correcting an asynchrony before the onset of the clinical counterpart.

A sudden rise of the flow waveform during expiration, leading to a biphasic expiration, may suggest different types of asynchrony, namely a premature cycling (termination of a breath while the patient is still inhaling), or an ineffective effort [2]. These asynchronies may be corrected by adjusting the expiratory and/or inspiratory trigger.

In a COPD patient we observed the aforementioned shape (left panel, arrow "a"), but some elements led us to a different diagnosis; indeed the flow drop was not due to a persisting inspiratory activity as shown by Pes and EAdi. However, the spirometry flow-volume plot revealed the concave expiratory shape, quite typical for airflow limitation.

Furthermore and in support of, those same breaths disclosed triggering delay both on the EAdi and Pes tracing (left panel, arrow "b"), disclosing the dissipation of the muscular pressure necessary to counterbalance intrinsic PEEP [3]. Our presumptive diagnosis of the observed asynchrony was expiratory flow limitation rather than a premature cycling or a missing effort (Figure 1).

Considering that, we neither adjusted the cycle off nor the trigger sensitivity; instead, we increased extrinsic PEEP obtaining the disappearance of the waveform abnormalities, eventually confirming our presumption.

References

1. Thille AW, Rodriguez P, Cabello B, Lellouche F, Brochard L (2006) Patient-ventilator asynchrony during assisted mechanical ventilation. *Intensive Care Med* 32: 1515-1522.
2. de Wit M (2011) Monitoring of patient-ventilator interaction at the bedside. *Respir Care* 56: 61-72.
3. Bellani G, Coppadoro A, Patroniti N, Turella M, Arrigoni Marocco S, et al. (2014) Clinical assessment of auto-positive end-expiratory pressure by diaphragmatic electrical activity during pressure support and neurally adjusted ventilatory assist. *Anesthesiology* 121: 563-571.

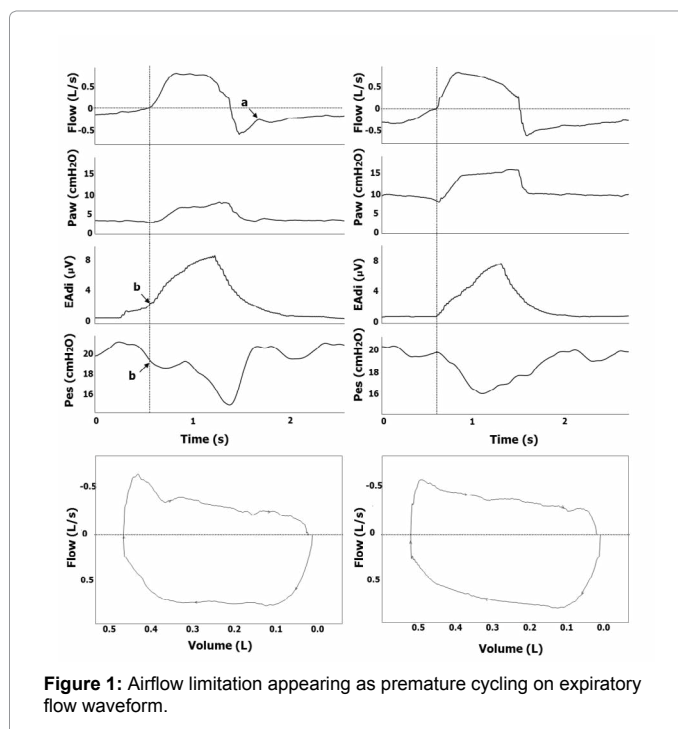


Figure 1: Airflow limitation appearing as premature cycling on expiratory flow waveform.

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