

LETTER

# Cardiac-related impedance changes obtained by electrical impedance tomography: an acceptable parameter for assessment of pulmonary perfusion?

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Electrical impedance tomography has become a tool for monitoring regional ventilation. Interest is growing to derive additional information on pulmonary perfusion and ventilation/perfusion distribution. Since signals recorded by electrical impedance tomography also contain cardiac-related impedance changes, attempts are made to evaluate them in view of perfusion. Recently in *Critical Care* a corresponding study applying an advanced filtering technique for separating cardiac signals from the dominant ventilation component was published [1]. The quality of the concept is demonstrated by comparing the results with solitary cardiac signals during breath-hold.

Similar to other publications dealing with this approach, the correct term cardiac-related impedance changes is substituted by perfusion. Although major aspects of limitations and missing validation are addressed in the discussion, the key message presented is that 'it is possible to distinguish between lung ventilation and perfusion using electrical impedance tomography.'

Vascular volume pulses which are the reasons for cardiac-related impedance changes in the lung area obviously do not unequivocally represent perfusion. Even peripherally occluded arteries will pulsate without flow. These pulsations are dependent on blood pressure and vascular as well as surrounding tissue compliance.

A reasonable approach to assess perfusion by electrical impedance tomography is the impedance indicator dilution technique, which is clearly favoured by recent

publications [2-4]. In contrast to the questionable pulsation approach, a homogeneous distribution of perfusion and ventilation/perfusion ratios was obtained [5].

In summary, the interpretation of cardiac-related impedance changes in view of perfusion will not be permissible until validation by established reference techniques including relevant pathophysiological conditions.

#### Competing interests

The authors declare that they have no competing interests.

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#### References

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