CORRESPONDENCE

Assessment of intraparenchymal lung collateral ventilation

We read with interest the paper of Marshall et al entitled ‘Direct visualisation of collateral ventilation in COPD with hyperpolarised gas MRI’.1 Collateral ventilation (CV) is defined as ‘the ventilation of alveolar structures through passages that bypass the normal airway’.2 This happens through the intra-alveolar pores of Kohn, the bronchio-alveolar communications of Lambert and the intrabroncholar pathways of Martin. These pathways exist in normal lungs, but CV is ineffective since the normal airway structure through passages that bypass the normal airway.

In emphysematous lungs, the alveolar wall destruction allows for the alveolar communications of Lambert and the intrabroncholar pathways of Martin. These pathways exist in normal lungs, but CV is ineffective since the normal airway obstruction increases expiratory resistance; this allows gas to move freely from one lobule to the other. Interlobar CV is possible although it is obviously related to the absence of interlobar valves (BLVR) is not indicated if interlobar CV is absent in case of complete ILF; (2) the identification of complete ILF is not accurate at CT scan.

The study reported by Marshall et al1 is extremely interesting and contributes to improve dynamic functional imaging in COPD patients with a novel MRI method during a single breath-hold. However, we believe, in line with the authors, that CV visualised with this technique is referred to as intersegmental gas flow; this variable is clearly not crucial to evaluate patients for BLVR. Furthermore, the single breath-hold method probably is not the most correct technique to assess CV because the important point to quantify the degree of emphysema is to visualise CV and also if and how CV disappears during ventilation. Furthermore, in this study, there is no correlation with the type of emphysema (heterogeneous vs homogeneous) and presence of complete or incomplete ILF. The catheter system certainly allows a more reliable assessment of interlobar CV although CT images should always be available; it has been extensively validated and should be considered the gold standard so far. We believe that the challenge of radiological techniques for the future is to develop new and accurate methods to visualise ILF and measure airflow during the normal breathing activity; once validated, this would contribute to speed and simplify preoperative work-up and treatment planning in COPD patients candidates to BLVR.

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