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Clinical Letter

Sequential and Multimodal Bronchoscopic Interventions for COPD: Toward a Highly Personalized Interventional Pulmonology?

To the Director,

If COPD patients are traditionally divided into two wide phenotypes of "blue bloater" and "pink puffer", there is a considerable proportion of overlapping patients with both advanced emphysema and chronic bronchitis and/or exacerbations (GOLD E). Bronchoscopic lung volume reduction (BLVR) with endobronchial valves (EBVs, evidence A in the GOLD recommendations), coils, thermal vapor ablation (evidence B) or agents inducing chemical sclerosis can be offered to selected emphysema patients.[1] However, bronchopathy represent a frequent contraindication, and preliminary data suggest a role for interventional bronchoscopy for this phenotype. Targeted lung denervation (TLD) aims to reduce exacerbations, while bronchial rheoplasty (BR) and metered cryospray aim to treat chronic bronchitis.[2]

To highlight the exciting perspectives of sequential interventions, we report the case of a 67-year-old, GOLD 3E COPD patient who suffered both an mMRC2 dyspnea but also recurrent exacerbations (1 moderate and 2 severe in the past year). FEV_1 was 0.6 L (38% pred), residual volume 5 L (RV, 284% pred). Chest CT showed severe heterogenous emphysema, but BLVR was contraindicated due to recurrent exacerbations and the patient was treated by TLD within the AIRFLOW 3 randomized sham-controlled trial (RCT). Except for a moderate exacerbation in the first month, no other events were noted after a two-year follow-up, but dyspnea and function tests were not modified. After a new evaluation for eligibility and target lobe selection, BLVR was offered (5 EBVs in the left upper lobe), resulting in a pneumothorax, which did not require chest tube. At 45 days, CT showed complete atelectasis, resulting in a decrease in RV (−930 ml), an increase in FEV_1 (+310 ml) at 6 months, and a significant clinical improvement (mMRC 1, 57 m increase in 6MWD) and no recurrence of exacerbations. Altogether, this patient experienced a dramatic improvement in her quality of life (overall 25.6 points decrease in the St Georges Questionnaire).

If this isolated case obviously does not allow to draw conclusion regarding the efficacy of the techniques used, it serves as an illustrative example of the potential future of bronchoscopic management of COPD. Although multimodal BLVR approaches have been reported,[3] this is to our knowledge the first report of a sequential bronchoscopic treatment of a GOLD E patient with

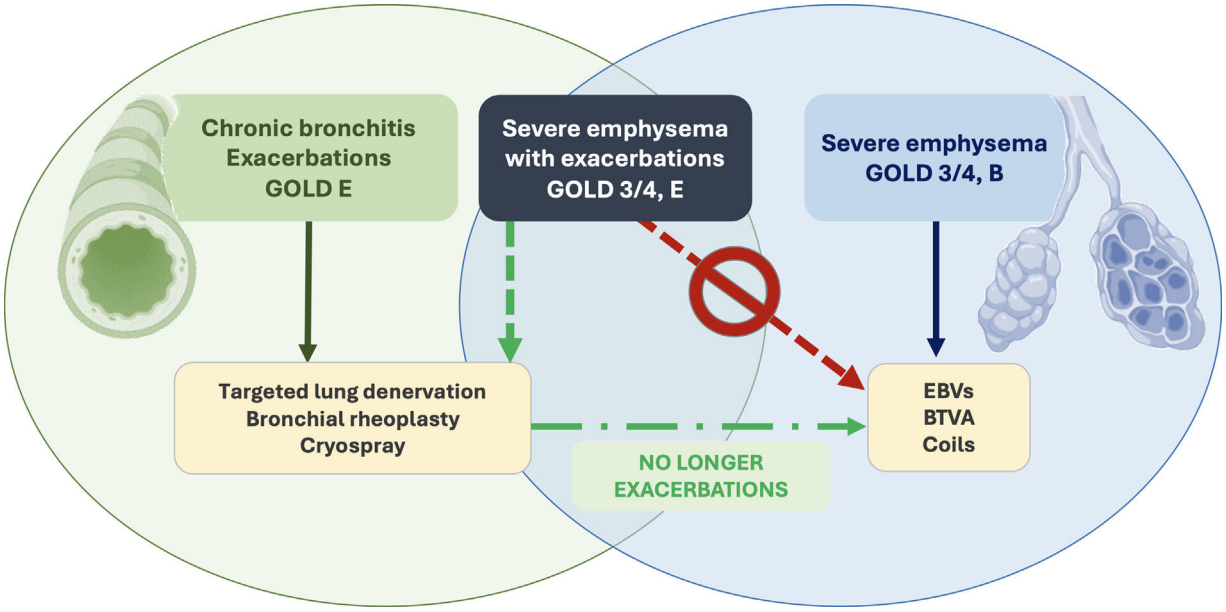

Fig. 1. Potential future of interventional pulmonology in COPD: Sequential and multimodal bronchoscopic treatments: Highly selected patients with severe emphysema can benefit from BLVR with EBVs (blue arrow). On the other side, emerging bronchoscopic treatment options (targeted lung denervation, bronchial rheoplasty, metered cryospray) may cover patients with chronic bronchitis and/or exacerbations, with or without emphysema (green arrow). But for patients with both severe emphysema and hyperinflation and exacerbations, BLVR are contraindicated. A sequential treatment starting with a treatment targeting the airways and in case of favorable outcomes, BLVR may be a new approach (light green arrow).

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both exacerbations and emphysema. If one or more approaches targeting the airways demonstrate a durable control of exacerbations and chronic bronchitis in their pivotal RCT (AIRFLOW 3 for TLD and RheSolve for BR have been completed and outcomes are awaited), the eligibility of some patients initially contraindicated for BLVR may be reconsidered, paving the way toward sequential bronchoscopic treatments in patients combining the two phenotypes (Fig. 1). Patients have been excluded for BLVR in 7–18% due to bronchopathy,[3,4] but since most patients are addressed from physicians who are aware of the contraindications of BLVR, the number might be much higher. Knowing the low proportion of COPD patients that can benefit from each technique,[4,5] the population that would fulfill criteria for 2 or more of these techniques would however probably still be limited.

Highly selected patients with severe emphysema can benefit from BLVR with EBVs (blue arrow). On the other side, emerging bronchoscopic treatment options (targeted lung denervation, bronchial rheoplasty, metered cryospray) may cover patients with chronic bronchitis and/or exacerbations, with or without emphysema (green arrow). But for patients with both severe emphysema and hyperinflation and exacerbations, BLVR are contraindicated. A sequential treatment starting with a treatment targeting the airways and in case of favorable outcomes, BLVR may be a new approach (orange arrow).

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Conflict of Interests

Nicolas Guibert received personal fees for consulting and lectures from PulmonX.

References

1. Herth FJF, Slebos D-J, Criner GJ, Valipour A, Sciurba F, Shah PL. Endoscopic lung volume reduction: an expert panel recommendation – update 2019. Respiration. 2019;97:548–57.
2. Hartman JE, Garner JL, Shah PL, Slebos D-J. New bronchoscopic treatment modalities for patients with chronic bronchitis. Eur Respir Rev. 2021;30:200281.
3. Bezzi M, Levi G, Darwiche K, Egenod T, Guibert N, Franzen D, et al. CONVERT Trial: Collateral ventilation conversion by closure of fissure defect with AeriSeal Foam for BLVR with Zephyr valves. 14.01 – interventional pulmonology. Eur Respir Soc. 2022:1231, http://dx.doi.org/10.1183/13993003.congress-2022.1231 [cited 1.2.24].
4. Polke M, Rötting M, Sarmand N, Krisam J, Eberhardt R, Herth FJF, et al. Interventional therapy in patients with severe emphysema: evaluation of contraindications and their incidence. Ther Adv Respir Dis. 2019;13, 1753466619835494.
5. Welling JBA, Hartman JE, Augustijn SWS, Kerstjens HAM, Vanfleteren LEGW, Klooster K, et al. Patient selection for bronchoscopic lung volume reduction. Int J Chron Obstruct Pulmon Dis. 2020;15:871–81.

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