Endobronchial lung volume reduction with valves reduces exacerbations in severe emphysema patients

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A single-center retrospective study examines the number of exacerbations before and after endobronchial/endoscopic lung volume reduction (ELVR).

Note: This procedure is also known as BLVR—Bronchoscopic Lung Volume Reduction.

"ELVR with valves appears promising to reduce the exacerbation rate in COPD patients, especially when the full treatment benefit of complete lobar atelectasis is achieved."

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Methods

- Single-center retrospective study examined the combination of moderate and severe exacerbation rates of 129 severe emphysema patients who received endobronchial valve treatment between 2016-2019 at the Thoraxklinik Heidelberg, University Hospital of Heidelberg, in Germany
- Only patients with complete exacerbation history one year prior and one year after BLVR were analyzed; data was pulled from electronic health records
- Exacerbations in this study refer to the combination of moderate and severe exacerbations, per these definitions:
  - Moderate = oral corticosteroids or antibiotics
  - Severe = hospitalization due to exacerbation

Patient Population

Baseline Mean ± Standard Deviation

- Age (years): 64.1 ± 7.7
- Sex: 56.6% female
- FEV_1 (%): 30.35 ± 8.50
- 6MWD (m): 278.62 ± 87.65

Results

Primary endpoint of study was the number of exacerbations* one year after endobronchial valve treatment compared to one year before.

Impact on Exacerbation Rates Following Endobronchial Valve Treatment**

	n	Exacerbation Rate Year Before Treatment	Exacerbation Rate First Year After Treatment	Decrease in Exacerbation Rate (Percent)
All patients who received Endobronchial Valve Treatment	129	2.5 ± 2.2	1.8 ± 2.2	**-32%** p=0.009
Patients who received Endobronchial Valve Treatment and had complete lobar atelectasis	41	2.8 ± 2.0	1.4 ± 1.8	**-50%** p<0.001

Patient Impact: 90% of all patients experienced at least one exacerbation in the year before Endobronchial Valve Treatment compared to 68.2% one year after treatment.

Other Factors: The only factor clearly associated with the number of exacerbations in the year after ELVR, was the number of exacerbations in the year before ELVR ($r = 0.209$, $p = 0.018$) and roflumilast therapy ($r = 0.212$, $p = 0.016$).

***Exacerbations in this study refer to the combination of moderate and severe exacerbations, as defined above.**

**Study inclusion criteria required a complete exacerbation history one year before and one year after Endobronchial Valve Treatment. As a result, only 129 of the 244 patients treated between 2016-2019 were included in the study.

Conclusion

There was a statistically significant decrease in the rate of combined moderate and severe exacerbations in the first year after BLVR. The decrease was greater in patients in whom complete lobar atelectasis was achieved.

The aim of COPD management is both to reduce symptoms and reduce future risk.[1] Consistent with these aims, this study highlights the importance of reducing risk in these patients by preventing and managing exacerbations.

Study limitations: Long-term data on exacerbation rates could not be conclusively obtained due to the relevant rate of loss to follow-up. The small patient population, lack of control group, and encouraging preliminary results all point to the need for further investigation of endobronchial valves and exacerbation rates.

Source: Brock et al. "Endobronchial lung volume reduction with valves reduces exacerbations in severe emphysema patients." Respir Med. 2023; 218:107399. doi: 10.1016/j.rmed.2023.107399

Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease; 2024.

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