

## Long-term results after lung volume reduction surgery in patients with $\alpha_1$ -antitrypsin deficiency

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*J Thorac Cardiovasc Surg* 2004;128:408-413

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Read at the Eighty-third Annual Meeting of The American Association for Thoracic Surgery, Boston, Mass, May 4-7, 2003.

Received for publication June 14, 2003; revisions received February 26, 2004; accepted for publication March 26, 2004.

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**BACKGROUND:** The favorable effects of lung volume reduction surgery for selected patients with smoker's emphysema has been demonstrated. However, outcome data for patients with  $\alpha_1$ -antitrypsin deficiency emphysema are scarce.

**METHODS:** We prospectively studied pulmonary function, dyspnea, and 6-minute walking distance in 21 patients with severe  $\alpha_1$ -antitrypsin deficiency emphysema (*PiZZ* 18, *PiZO* 1, *PiSZ* 2, 10 female patients, median age 56 years, range 38-74 years) for as long as 5 years after thoracoscopic lung volume reduction surgery.

**RESULTS:** Lung volume reduction surgery improved the mean dyspnea score, from  $3.7 \pm 0.1$  preoperatively to  $1.4 \pm 0.2$  at 3 months; the score remained improved for as long as 3.5 years. Mean vital capacity (% predicted) improved from  $79\% \pm 4.4\%$  to  $98\% \pm 4.8\%$  at 3 months, and the ratio of residual volume to total lung capacity decreased from 0.67 to 0.51. These improvements lasted for as long as 2 years. The mean airflow obstruction (forced expiratory volume in 1 second % predicted) improved from  $27\% \pm 1.9\%$  to  $38\% \pm 3.3\%$  at 3 months and remained statistically improved for 1 year. Four patients showed long-term improvement in lung function for as long as 3.5 years. These patients had markedly heterogeneous emphysema and showed no radiologic signs of airway inflammation.

**CONCLUSIONS:** Lung volume reduction surgery in patients with advanced emphysema from  $\alpha_1$ -antitrypsin deficiency results in a significant improvement in dyspnea and lung function for as long as 3.5 years in some cases. It appears that magnitude and duration of these effects are inferior and shorter than those in patients with pure smoker's emphysema. Patients with heterogeneous disease and no or minor inflammatory airway disease may benefit most.