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Bilateral Thoracoscopic Staple Lung Volume Reduction Surgery

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linear regression analyses between scores on the MMRC scale and spirometric variables may be meaningless. A more quantitative analysis of dyspnea with the Borg scale or the visual analogue scale is necessary to assess the correlation between dyspnea relief and improvements of pulmonary functions.^{5,6} I believe that dyspnea response after bilateral thoracoscopic staple LVRS may be consistently observed for 6 months and that the quantitative assessment of dyspnea may reveal the close relationship between improvement in dyspnea and improvement in pulmonary function, particularly the ratio of residual volume to total lung capacity and inspiratory muscle strength.^{2,3,5}

Although the data from Brenner et al¹ were not properly analyzed, their study is still very important. There is no doubt that long-term results of objective and subjective improvements are required for determining the efficacy of LVRS for diffuse or inhomogeneous emphysema. That is why an appropriate assessment of dyspnea at rest and during exercise may provide a valuable piece of information for both physicians and surgeons. Consequently, it will clarify which of the many measurements of lung function are those that correlate with the long-term symptomatic improvement and should be monitored after LVRS.

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To the Editor:

We agree that using linear regression analysis of changes in MMRC scores after LVRS is not an ideal way to assess quantitative subjective dyspnea response. As pointed out, the MMRC scale is not necessarily linear, so assessment of changes are not expected to follow a linear pattern with response. Additionally, the MMRC scale is integral, not continuous. Thus, linear regression is of limited applicability. Nonetheless, the trends in dyspnea response after LVRS were often opposite in direction from those expected on the basis of objective pulmonary function response (irrespective of linearity of the association). These trends raise important questions regarding optimal patient selection and response criteria. The results of this study are not meant to provide definitive answers to the relation between dyspnea and

Bilateral Thoracoscopic Staple Lung Volume Reduction Surgery

Does Improvement in Dyspnea Correlate With Improvement in Pulmonary Function?

To the Editor:

In the October 1997 issue of CHEST, Brenner and coworkers¹ demonstrated that lung volume reduction surgery (LVRS) produced symptomatic and spirometric improvement for 6 months in patients with inhomogeneous emphysema. However, they failed to demonstrate a significant relationship between improvement in dyspnea and improvement in pulmonary function.

Although several lines of evidences suggest a certain relation of lung functions to the reduction in dyspnea shortly after LVRS in emphysema,^{2,3} the relation between symptomatic improvement and long-term results of pulmonary function has not yet been determined.^{4,5} Therefore, the current findings may be very important. However, I point out that the analysis for the relation between symptomatic response and spirometric variables is not appropriate in the current study. Unfortunately, the authors evaluated the intensity of dyspnea in patients with emphysema by using the Modified Medical Research Council (MMRC) scale. Because the MMRC is not a linear scale but a grading scale,

objective LVRS response because of the limitations of the methodology. Rather, the main purpose of the study was to raise questions about some currently accepted LVRS criteria that need further investigation with more specific dyspnea response analyses.

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