Durable benefits seen for lung volume reduction surgery for emphysema

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Emphysema is a chronic, progressive, obstructive lung disease in which the small sacs of the lung (alveoli) are destroyed, leading to air pockets and severe breathing difficulties. In 2011, 4.7 million Americans reported being diagnosed with emphysema, and in 2013 more than 8200 patients died from emphysema. At the 95th AATS Annual Meeting in Seattle, WA, Dr. Ginsburg will present the results of 10 years of experience with LVRS for emphysema, covering the period between 2004 and 2014.

While traditionally emphysema has been treated medically, a surgical option, lung volume reduction surgery (LVRS), was introduced in 1993. LVRS removes diseased portions of the lung and allows the expansion of remaining, still-functional lung tissue. In 2003, the National Emphysema Treatment Trial (NETT) validated the efficacy of LVRS in improving survival and function in selected patients with severe emphysema, especially those with mostly upper-lobe emphysema and low exercise capacity, who were monitored for a mean of 2.4 years (N Engl J Med 2003;348:2059-2073). Soon after the results were published, the Centers for Medicare and Medicaid Services decided to provide coverage of LVRS.

"Despite these results, adoption of LVRS in the U.S. for the treatment of severe emphysema has been exceedingly poor. A review of the Society of Thoracic Surgery database identified only 538 LVR surgeries over an eight-year period," stated Mark E. Ginsburg, MD, Associate Professor of Surgery, Division of Cardiac, Vascular, and Thoracic Surgery at

Columbia University Medical Center. Possible reasons cited for poor utilization are the perceived magnitude of the procedure, perceived high surgical mortality and morbidity, ill-defined patient selection criteria, inconsistent and unpredictable benefits, and lack of proven durability. Some physicians have also been anticipating the introduction of a bronchoscopic approach, although no such device has yet to receive clinical approval in the U.S.

Of the 91 patients who underwent LVRS from 2004 to 2014, 41.8% were male and the mean age was 62.5 years. The majority of patients underwent minimally-invasive, bilateral video-assisted thoracoscopic surgery (VATS) (78, 85.7%) and 11 (12.1%) underwent sternotomy. Two patients were only able to undergo unilateral VATS. All patients were either NETT Group 1 (mostly upper-lobe emphysema and low exercise capacity) or Group 2 (mostly upper-lobe emphysema and high exercise capacity).

Patients generally had to be hospitalized for eight days, two days of which were spent in the ICU. Most patients were able to go directly home. There were three cases of respiratory failure requiring re-intubation, although none have been reported since 2010.

The study clearly demonstrated that LVRS can be performed with negligible surgical mortality risk using minimally invasive surgical techniques. There were no perioperative mortalities and no patients died within six months of LVRS. Overall survival for the group was 0.99 at 1 year, 0.97 at 2 years, and 0.78 at 5 years. Only 12 of 23 late deaths were attributed to lung problems.

Functional improvement was seen on several lung function assessments. For instance, at one year, there was a mean improvement of 43% from baseline in forced expiratory volume in one second (FEV1) (n=58 patients). At five years, the mean improvement in FEV1 was 44%

(n=18), indicating that the beneficial effect of LVRS was durable. "Indeed, improvements in airflow, exercise capacity, and dyspnea were relatively stable for five years," said Dr. Ginsburg.

"Surgical LVRS remains the gold standard against which all other forms of lung volume reduction must be judged. Surgical LVRS should be more widely offered to patients with advanced emphysema who meet CMS selection criteria," concluded Dr. Ginsburg.

More information: "Safety, Efficacy, and Durability of Lung Volume Reduction Surgery: A 10-Year Experience," by Mark E. Ginsburg, MD, Byron M. Thomashow, MD, William M. Bulman, MD, Patricia A. Jellen, MSN, Beth A. Whippo, MSN, Cody Chiuzan, PhD, Dan Bai, MS, Joshua Sonett, MD. Presentation at the 95th AATS Annual Meeting. April 25-29, 2015. Seattle, WA, during the General Thoracic Surgery Simultaneous Scientific Session on April 29, 7:31 AM PT.

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