Tiny implanted coil improves lung function in patients with severe emphysema

May 23 2012

A tiny, resilient metal wire designed to gather and compress diseased lung tissue may offer relief to patients with severe heterogeneous emphysema, a subtype of the disease that involves specific, usually isolated areas of the lungs, according to the results of a multicenter international trial conducted in the Netherlands, Germany and France. The wire, called a lung volume reduction coil (LVRC), can be easily implanted and is designed to take the place of more invasive procedures used to improve the lung function of emphysema patients.

The study will be presented at the ATS 2012 International Conference in San Francisco.

"Our results indicate that LVRC treatment is technically feasible in both upper and lower regions of the lung in patients with severe heterogeneous emphysema, and results in significant improvements in pulmonary function, exercise capacity and quality of life, with an acceptable safety profile," said study lead author Dirk-Jan Slebos, MD, pulmonary physician at the University Medical Center Groningen (UMCG), The Netherlands.

Lung volume reduction is performed in patients with emphysema in an effort to isolate diseased lung tissue and allow healthy lung tissue to expand and function more efficiently, which in turn helps the patient to breathe and function better. Because heterogeneous emphysema involves different areas, or lobes, of the lung, surgery to contain diseased lung tissue can be complicated and extensive. Use of wire coils, which can be

implanted in relatively noninvasive bronchoscopic procedures, is emerging as a more effective, and safer, option than surgery for these patients. Coils are compressed during implantation, and expand to their original shape once implanted in the lung tissue.

Although a previous single-center trial showed LVRC to be safe and effective in patients with severe upper-lobe emphysema, Dr. Slebos said this study involved patients treated at 11 different healthcare centers, and explored the safety, efficacy and feasibility of LVRC in both upper and lower lobes.

The study enrolled 53 patients who underwent 101 LVRC procedures, including 46 bilateral (both lungs) procedures and nine unilateral procedures. In each procedure, the clinicians implanted from eight to 14 coils, resulting in a study total of 1,070 coils being implanted. Safety was evaluated by recording all adverse events that occurred within the first 30 days following treatment, as well as those that occurred between 30 days and six months of treatment. Efficacy was measured by quality-of-life questionnaires, pulmonary function testing and exercise testing, all performed six months following treatment. Reported adverse events included exacerbation of chronic obstructive pulmonary disease (COPD), pneumonia, collapsed lung, chest pain and mild hemoptysis, or coughing up blood, which could be managed with standard care.

The researchers found that LVRC treatment resulted in significant improvement in respiratory measurements at six months, especially in patients whose lungs were severely hyperinflated. In this group, LVRC therapy resulted in significant improvements in lung function, hyperinflation, exercise capacity and quality of life measurements. In fact, severe hyperinflation at baseline appeared to be an indicator of better outcomes, Dr. Slebos noted.

"Hyperinflation of lung tissue is one of the key pathophysiological

features of emphysema that is responsible for shortness of breath, and its magnitude seems to be a good indicator of successful LVRC treatment," he said.

Dr. Slebos said the trial is ongoing and continues to collect data.

"The results so far indicate that the LVRC is a safe and effective choice for treating patients with severe heterogeneous emphysema where current medical treatment fails, and as we continue to collect follow-up data, we hopefully will have a more complete profile of its applications in this patient population," he said.

More information: "Lung Volume Reduction Coil Treatment For Patients With Severe Heterogeneous Emphysema, A Multicenter Feasibility Trial" (Session D15, Wednesday, May 23, Room 2005-2007, Moscone Center; Abstract 27924)

Provided by American Thoracic Society