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Higher Mortality with Surgery for Early NSCLC
Lower Mortality with SBRT at 30, 90 days

By Charles Bankhead, Senior Associate Editor, MedPage Today

Older patients with operable early non–small cell lung cancer (NSCLC) had significantly lower post-treatment mortality with stereotactic body radiotherapy (SBRT) as compared with surgery, a retrospective review of a large database showed.

In the overall, propensity-matched, and age-stratified analyses, SBRT was associated with lower mortality at 30 and 90 days (P<0.001). The mortality advantage over surgery increased with patient age, the greatest difference occurring in patients older than 70.

"Post-treatment mortality rates were higher after surgery versus SBRT within most age groups in our study, with the exception of the youngest cohorts, which notably included much smaller numbers of patients treated with SBRT," concluded Chad G. Rusthoven, MD, of the University of Colorado in Aurora, and colleagues in the *Journal of Clinical Oncology*. "These data may inform shared decision-making between providers and patients with early-stage NSCLC, particularly those with advanced age or at a high risk of perioperative mortality."

The results are consistent with findings from other institutional and population-based studies, showing that surgery is associated with higher post-treatment mortality, particularly for older patients and those with significant comorbidities, according to Charles B. Simone II, MD, of the University of Maryland Medical Center in Baltimore, who was not involved with the study.

"[SBRT] has emerged as the standard of care for patients with medically inoperable early-stage [NSCLC] and can achieve excellent local control and overall survival in this patient population," Simone told *MedPage Today* in an email. "Given the risks of morbidities and even mortality from surgery, along with the increasing use of and promising outcomes with SBRT for medically

inoperable patients, there is increasing equipoise to consider SBRT, even in medically operable patients, as a way of potentially reducing the risks associated with surgery."

The findings support recent clinical guideline recommendations from the American Society for Radiation Oncology (also endorsed by the American Society of Clinical Oncology) encouraging discussions about SBRT as a potential alternative to surgery for patients with early-stage NSCLC and high operative risk, Simone added.

Investigators in several randomized trials sought to compare SBRT and surgery for early operable NSCLC, but most ended early because of slow patient accrual. Nonetheless, a pooled analysis of two of those trials (involving a total of 58 patients) showed significantly better overall survival at 3 years with SBRT and numerically superior recurrence-free survival.

To continue the investigation of potential mortality differences between SBRT and surgery in early NSCLC, Rusthoven and coauthors queried the National Cancer Database and identified almost 85,000 patients who received treatment for early NSCLC (cT1-T2a N0 M0) from 2004 to 2013. The study population consisted of 76,623 patients treated with surgery and 8,216 treated with SBRT.

The primary outcomes were 30- and 90-day mortality. Analysis of the entire population showed a 30-day mortality of 2.07% with surgery and 0.73% with SBRT ($P<0.001$). The between-group difference narrowed by 90 days but continued to show a slight, statistically significant advantage for SBRT (3.59% versus 2.93%, $P<0.001$).

The mortality advantage in favor of SBRT increased in a propensity-matched analysis involving 27,200 patients. The results showed a 30-day mortality of 2.41% with surgery and 0.79% with SBRT ($P<0.001$). The absolute difference at 90 days increased as compared with the overall analysis (4.23% versus 2.82%, $P<0.001$).

The analyses revealed a significant interaction between mortality and age ($P<0.001$). Among patients ages 71 to 75, the absolute difference in favor of SBRT was 1.87% at 30 days and 2.02% at 90 days. A similar disparity was observed in patients ages 76 to 80 (2.80% at 30 days, 2.59%

at 90 days) and those older than 80 (3.03% at 30 days, 3.67% at 90 days; $P \leq 0.001$ for all comparisons).

The mortality risk at both 30 and 90 days increased with more extensive surgery: sublobar resection (HR 2.85 and HR 1.37, respectively), lobectomy (HR 3.65, HR 1.60), and pneumonectomy (HR 14.5, HR 5.66; $P < 0.001$ for all comparisons versus SBRT).