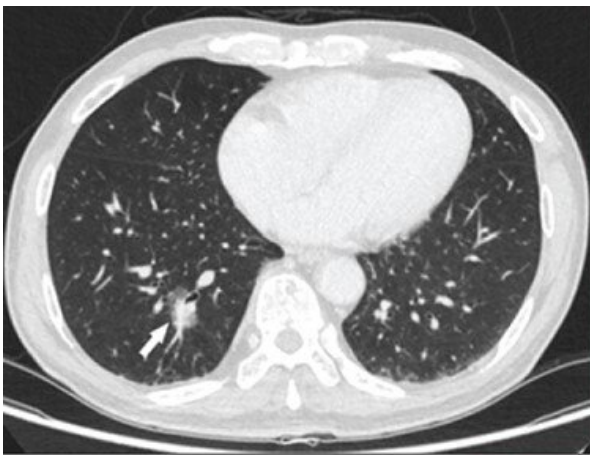
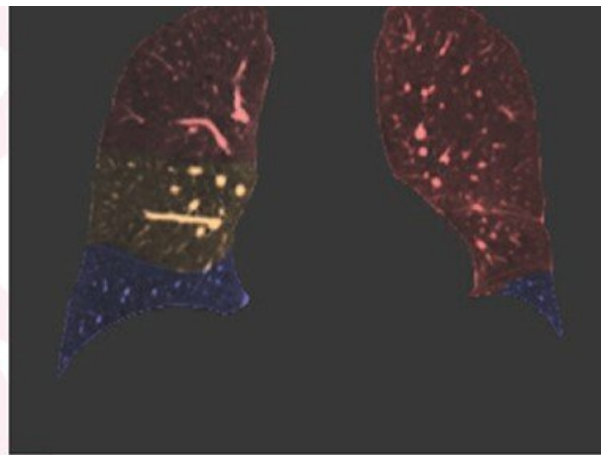


# Dual-energy CT assesses postoperative lung volume, perfusion changes

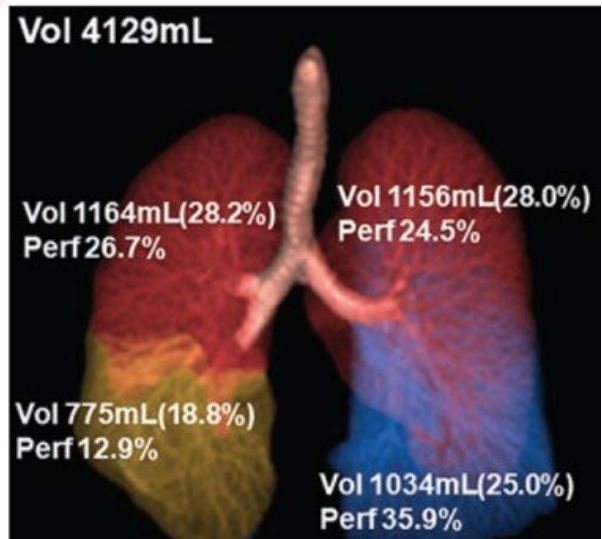
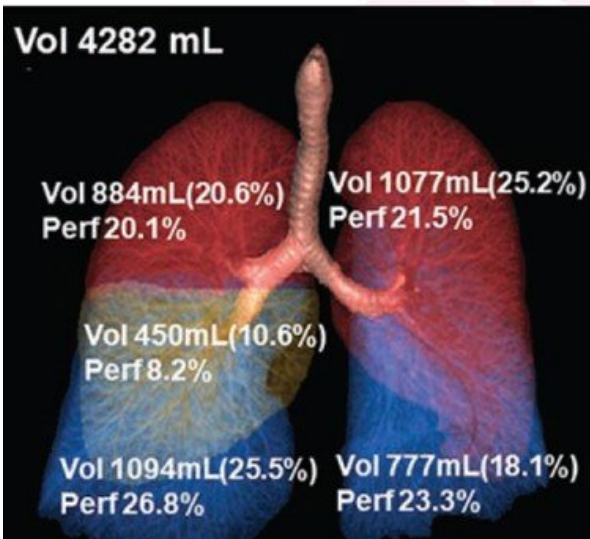
November 2 2022



A



B



(A) Axial image from preop DECT chest exam shows 2.3-cm part-solid nodule in right lower lobe (arrow). Nodule confirmed to represent lung adenocarcinoma, based on pathologic assessment of surgical specimen. (B) Monochromatic image

at 70-KeV with color overlay shows segmentation of five pulmonary lobes. Red indicates upper lobes; yellow indicates right middle lobe; and blue indicates lower lobe. 3D volume-rendering images from (C) preop and (D) 6-month postop DECT show volume, volume ratio, and perfusion ratio for each lobe; ratios computed with respect to entire lung. Values used to compute postop changes in lung volume ratio and lung perfusion ratio for each lobe. Credit: ARRS, AJR

According to an accepted manuscript published in the *American Journal of Roentgenology (AJR)*, metrics derived from dual-energy CT (DECT) can provide insight on physiologic changes after lung cancer surgical resection, beyond the information provided by pulmonary function tests (PFTs) and conventional CT.

"DECT depicts patterns of lung volume and [perfusion](#) changes after lung cancer surgery, depending on surgical approach (lobectomy vs. limited [resection](#)) and tumor lobar location," wrote corresponding author Young Jin Kim, MD, Ph.D., from the Research Institute of Radiological Science at Korea's Yonsei University College of Medicine.

In this *AJR* accepted manuscript, 81 patients (38 men, 43 women; mean age, 60.5 years; lobectomy in 43, limited resection in 38) awaiting lung cancer resection surgery between March 2019 and February 2020 were included. Patients underwent thoracic DECT and PFT evaluation preoperatively and 6 months postoperatively.

Pulmonary lobes were segmented, and lobar volume and perfusion ratios—both relative to whole-lung values—were computed. Perfusion measures reflected DECT-derived iodine content. Patients then completed 6-month postoperative quality-of-life questionnaires.

Ultimately, lung perfusion ratio increases were greater after lobectomy

than limited resection for ipsilateral nonresected lobe(s) ( $39.9\pm 20.7\%$  vs  $22.8\pm 17.8\%$ ) and contralateral lung ( $20.9\pm 9.4\%$  vs  $4.3\pm 5.6\%$ ). After right lower lobe lobectomy, the largest postoperative increases in lung volume ratio occurred in the right middle lobe ( $44.1\pm 21.0\%$ ), whereas the largest postoperative increase in [lung](#) perfusion ratio occurred in the left lower lobe ( $53.9\pm 8.6\%$ ).

Noting some postoperative changes in DECT-derived volume and perfusion parameters showed a correlation with patient-reported postoperative quality-of-life scores, "the findings indicate a potential role of DECT-derived metrics for understanding the variable physiologic impacts of [lung cancer](#) resection surgeries," the authors reiterated.

**More information:** Young Joo Suh et al, Patterns of Postoperative Changes in Lung Volume and Perfusion Assessed by Dual-Energy CT: Comparison of Lobectomy and Limited Resection, *American Journal of Roentgenology* (2022). [DOI: 10.2214/AJR.22.28450](https://doi.org/10.2214/AJR.22.28450)

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