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## **Quantitative CT imaging to predict postoperative pulmonary function in patients undergoing lung resection surgery: pilot study**

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Anatomical segment-counting is the common approach to estimate postoperative lung function in patients candidates for pulmonary lobectomy. However, this method provides a global and theoretical evaluation only. We hypothesize that quantitative parameters derived from preoperative CT imaging may predict postoperative lung function more accurately than anatomical segment-counting technique.

Preoperative chest CT at full inspiration and pulmonary function tests (PFTs) from 12 patients who underwent pulmonary lobectomy (age:  $70\pm 11$  years, preoperative FEV1:  $\text{preFEV1}=97\pm 16\%$ ) were retrospectively analysed. CT images were processed by segmenting lungs and lobes, and we calculated, in the overall lungs and individual lobes, textural parameters of lung parenchyma, volumes and weights. Imaging parameters were combined with preFEV1 to predict postoperative FEV1 (postFEV1) and the correlations between measured and predicted postFEV1 were calculated.

Measured postFEV1 ( $\text{postFEV1}=64\pm 19\%$ ) correlated to predicted postFEV1 calculated using CT parameters, respectively, functional volume (lung volume between  $-910\text{HU}$  and  $-500\text{HU}$ ,  $r=0.81$ ,  $p=0.002$ ) and tissue weight ( $r=0.76$ ,  $p=0.004$ ). Lower correlation was found between measured postFEV1 and predicted postFEV1 calculated using anatomical segment-counting ( $r=0.73$ ,  $p=0.005$ ).

These preliminary results show that preoperative CT parameters can reliably predict lung function, offering a more in-depth analysis of the operability of lung cancer patients, particularly in subjects with impaired respiratory function.

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