



Preoperative pulmonary function testing and postoperative complications

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Lung resection is the standard therapeutic option for early-stage non-small cell lung cancer and its incidence has been increasing worldwide (1). Postoperative pulmonary complications are associated with increased postoperative mortality and prolonged hospital stay (2-4). Thus, many investigators have reported risk factors of postoperative pulmonary complications (5,6). Particularly, it must be clinically useful to stratify risk of postoperative complications with simple and non-invasive assessment methods including computed tomography (CT) findings (7,8) and exercise testing (9-11). On the other hand, conventional laboratory spirometry (LS) is the gold standard in preoperative assessment for risk stratification of postoperative pulmonary complications to date (12-14) and the quality of life following pulmonary resection is strongly associated with long-term change of LS parameters (15,16) which is significantly influenced by degree of compensatory response (17) as well as preoperative smoking status (18). However, in some situations, limited medical resources cannot necessarily allow us to perform LS.

For these reasons, some researchers have investigated potential clinical relevance of office-based spirometry (OS) that can be easily performed in outpatient office with less cost and time (19). Previous investigations demonstrated that OS parameters including expiratory volume in one second (FEV1) and forced vital capacity (FVC) had been significantly correlated with LS parameters (20) and OS

was reportedly useful for screening of chronic obstructive pulmonary disease (COPD) (21). In a recent paper of Hudson *et al.* in the *Annals of Thoracic Surgery* (22), the authors demonstrated that patients who had undergone preoperative OS had experienced similar major morbidity to those who had undergone preoperative LS after propensity score matching. Their data suggests that OS can be used as preoperative assessment without LS. This finding could be a basis for planning a prospective study to compare predictive ability of postoperative pulmonary complications between OS and LS. Meanwhile, they enrolled only low-risk patients in this study, which may result in no postoperative mortality and quite low readmission rate.

For thoracic surgeons, stratifying poor risk patients is one of the most important clinical demands. It may lead us to select less-invasive treatment including sublobar resection or stereotactic body radiotherapy. Whereas, it is still unknown whether OS can be used in normal or high-risk patients as preoperative assessment, because Hudson *et al.* employed only low-risk patients (22). Of note, almost two third patients had undergone sublobar resection even after propensity matching. It may cause very few events, so that potentially LS as well as OS could be omitted preoperatively.

In considering future routine use of preoperative OS, it is mandatory to investigate whether OS has similar predictive ability of postoperative morbidity especially in normal and

high-risk patients. Although the previous study had shown significant correlation between OS and LS for both forced FEV1 and FVC in patients with COPD (20), it should be also noted that there are patients at high-risk for pulmonary complications even if the spirometry data does not show low FEV1/FVC (8,23). Moreover, it is also great interests of pulmonary physicians whether both FEV1 and FVC of OS show significant association with those of LS in patients with a variety of pathologies.

OS is easily available and notably economical test compared with LS (24). These robust benefits are clinically significant in any setting. Since preoperative evaluation is often time-consuming and futile, it is sometimes stressful for patients as well as physicians.

In summary, the novel simple and cost-effective spirometry and its usefulness in preoperative evaluation in normal and high-risk patients needs to be investigated in large-scale cohort, possibly in prospective study. Better risk stratification of postoperative complication with using OS may improve our clinical practice and impact on medical economy in near future.

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Footnote

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