



Squamous-cell carcinoma of the recipient's explanted lung

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A 66-year-old male patient with chronic obstructive pulmonary disease (COPD) underwent right lung transplantation 2 years ago. He has been a smoker for over 30 years, consuming approximately one pack of cigarettes daily. However, the donor of the transplanted lung had no history of smoking or malignant tumors. The patient undergoes a chest computed tomography (CT) scan every three months after surgery, and a chest CT scan one year later revealed a small solid nodule with a diameter of ~0.5 cm in the posterior basal segment of the right lower lung (*Figure 1A*, blue arrow). The pulmonary nodule increased to a diameter of 1 cm after 3 months (*Figure 1B*, blue arrow). After four and a half months the chest CT showed an enlarged pulmonary nodule ~2.5 cm in diameter with shallow lobulation, short hair spurs on the edge and the presence of pleural traction, suggesting peripheral lung cancer (*Figure 1C*, blue arrow). Whole-body positron emission tomography/CT imaging revealed hypermetabolism in the right lower lung nodule (*Figure 2A*, red arrow), with no hypermetabolic lymph nodes in the bilateral hilar or mediastinal regions, and no metastatic tumors throughout the body. Bronchoscopy examination identified no abnormal mucosa. Preoperative lung function examination showed diffusing capacity of the lung for carbon monoxide was 63% of the predicted value; forced expiratory volume in one second was 1.89 L, accounting for 61% of the predicted value. Pulmonary

ventilation perfusion scanning indicated that the right lower lung perfusion accounted for 37% of the total, while ventilation accounted for 42%. The patient underwent right lower lobectomy and lymph node dissection of the hilum and mediastinum. The pathology results confirmed a diagnosis of squamous cell carcinoma (*Figure 2B*), with the pathological staging being T1N0M0, stage IA. Three days after surgery, the patient was admitted to the ICU for dyspnea and underwent invasive ventilation via endotracheal intubation.

Patients with COPD secondary to smoking face a significantly elevated risk of lung cancer following lung transplantation, particularly single-lung transplantation, with lung cancer rarely originating from the donor lung (1). A case series study encompassing 520 lung transplant cases from a single center over 17 years revealed that 12 patients developed lung cancer, with only one instance being in the donor lung (2). For most solid organ transplant recipients who develop new cancer post-transplantation, research recommends reducing immunosuppressive therapy (3,4) instead of continuing with standard immunosuppressive therapy. During the perioperative period, the patient discontinued mycophenolate mofetil, lowered the target concentration of tacrolimus to approximately 8 ng/mL, and maintained a dosage of 15 mg prednisone acetate. Based on international expert consensus, patients should be cancer-free for at least 3–5 years prior to lung transplantation to

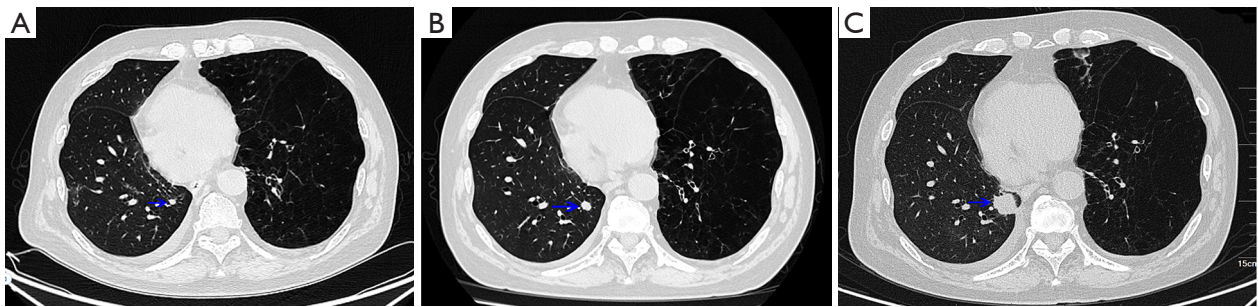


Figure 1 A timeline chart for chest CT. (A) One year after lung transplantation, a chest CT scan revealed a small solid nodule with a diameter of ~0.5 cm in the posterior basal segment of the right lower lung (blue arrow). (B) Three months later, the pulmonary nodule increased to a diameter of 1 cm after 3 months (blue arrow). (C) Four and a half months later, chest CT showed an enlarged pulmonary nodule ~2.5 cm in diameter with shallow lobulation, short hair spurs on the edge and the presence of pleural traction (blue arrow). CT, computed tomography.

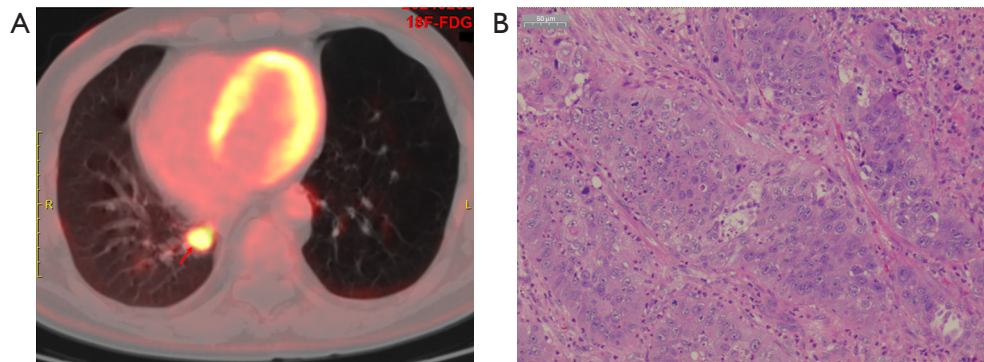


Figure 2 PET/CT and pathology results. (A) Whole-body PET/CT imaging revealed hypermetabolism in the right lower lung nodule (arrow); (B) the hematoxylin and eosin staining of pulmonary nodule confirmed a diagnosis of squamous cell carcinoma. $\times 400$. PET, positron emission tomography; CT, computed tomography; ^{18}F -FDG, ^{18}F -fluorodeoxyglucose.

minimize postoperative cancer recurrence and enhance the success rate of the procedure (5). However, for patients with early lung cancer, particularly those ineligible for conventional surgical removal due to pulmonary limitations or multifocal tumors, lung transplantation may be a viable option (4). The patient's preoperative lung function was compromised, with a disproportionately high ventilation perfusion ratio in the right lower lobe. Following right lower lobectomy, the pulmonary ventilation may fall short of the patient's requirements. Consequently, bilateral lung transplantation is another viable option worth considering.

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Footnote

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have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this article and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

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