



Therapeutic strategy for lung adenocarcinoma with pure ground-glass opacity: surgery, radiotherapy, or watchful waiting?

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Ground-glass opacity (GGO) is often detected on chest computed tomography (CT) during medical screening or during the examination for other diseases, and the treatment strategy for GGO is the topic of debate. Due to the location of the tumour and its small size, transbronchial lung biopsy or CT-guided needle biopsy is difficult to perform, and follow-up is often the first step. In the European guidelines for the surgical management of pure GGOs, nodules less than 6 mm are recommended for no routine follow-up while nodules more than 6 mm are recommended for observation every 2 years until 5 years. If solid components or growth develops, resection is considered (1). Obayashi *et al.* reported that the volume doubling time of lung adenocarcinoma with GGO was significantly longer than that without GGO (725 *vs.* 177 days), indicating that GGO lesions tend to grow slowly over many years (2).

Radiotherapy is a treatment option for low-risk patients, and the usefulness of stereotactic body radiotherapy (SBRT) has been reported (3,4). However, it is difficult to make a definitive diagnosis of lung cancer before treatment because of small nodules, as mentioned above. SBRT is disadvantageous in that a definitive diagnosis of lung cancer cannot be made before treatment in many cases, so treatment is probably performed with an undetermined diagnosis, and posttreatment changes appear on images

after radiotherapy, making it difficult to evaluate whether recurrence or posttreatment changes have occurred.

Surgical treatment is the first choice for patients who can tolerate surgery. In recent years, the usefulness of intensive sublobar resection for small lung cancer has been reported, and the prognosis of segmentectomy is better than that of lobectomy (5). In addition, the 5-year recurrence-free survival rate of partial lung resection for peripheral GGO-dominant lesions with a consolidation tumour ratio (CTR) <0.25, which is the diameter of the tumour's substantial component divided by the overall diameter, was 99.7%, which is a good result (6).

In the article reported by Li *et al.* in this study (7), 308 lung adenocarcinomas showing pure GGO were operated on, and the prognosis was assessed at the follow-up visits for 10 years. The 10-year recurrence-free survival rate was 100%, which was very good. One hundred and twenty-one lobectomies were performed (39.3%) and 187 sublobar resections were performed (60.7%). There was no difference in the 10-year recurrence-free survival rate between lobectomy and sublobar resection despite 21.6% of patients having pathologically invasive components. The 173 patients who underwent wedge resection had no recurrence, which is surprising. The good results may be attributed to sufficient surgical margins.

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Spread through air spaces (STAS) has recently been mentioned as a new pattern of pulmonary tumour extension; it has been shown to be a poor prognostic factor and a risk factor for margin recurrence in patients with lung metastases of colorectal cancer (8) and a strong prognostic factor in patients with lung cancer (9,10). We previously demonstrated that STAS was positive in 13.8% of stage I lung adenocarcinomas with a CTR <0.5, suggesting that it is important to ensure adequate margins for resection of lung cancer (10).

Li *et al.* also reported that secondary primary lung cancer (SPLC) was observed in 2.2% of patients, and the rate at which sublobar resection is performed has been increasing since 2011 (7). Surgical treatment of pure GGO is expected to increase in the future, and this study by Li *et al.* is an important contribution to this trend.

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