



# Wedge resection, segmentectomy or lobectomy: the correct choice considering the risk of lobar lymph node involvement

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Identification of lymph node metastases remains a milestone in non-small cell lung cancer approach, for a precise staging and in particular to plan the correct treatment (1,2). This concept is fundamental in patients with mediastinal involvement, in which multimodal treatment combining radiotherapy, chemotherapy or surgery ensures the best outcome compared to single treatment.

On the other hand, in patients with hilar involvement, surgery is indicated as the first treatment, with platinum-based adjuvant therapy indication after resection. It is important to note that pre-treatment lymph node assessment is indicated in case of suspected/potential mediastinal involvement, while histological diagnosis in suspected N1 is not usually required. However, hilar involvement may have a crucial role in the therapy of elderly/compromise patients or in presence of small cancer less than 2 cm of diameter.

Indeed, these categories of patients may receive a sub-lobar resection, with well-known benefits in terms of residual lung function and quality of life, so a wedge resection or a segmentectomy may be considered in their surgical treatment (3,4). Conversely, despite wedge resection may be more rapid, easy and parenchyma sparing than segmentectomy, overall and disease-free survival rate are usually worse than anatomical resections (5). This fact may be also due to a rough lymph node assessment, because lymphadenectomy in wedge resection is usually reduced to few nodes or absent, with consequent risk of incorrect staging.

Similarly, patients underwent segmentectomy may

also have incomplete lymph node assessment if the nodes around the other segmentary bronchi or around the main and lobar bronchus are not dissected during surgery, leading to a partial pathological staging with the risk of occult node involvement (6).

For these reasons, patients with occult hilar metastases may remain without administration of adjuvant therapies, with a worse impact on their prognosis. These considerations show that sub-lobar resections may be carefully indicated not only considering the primitive tumor characteristics, but also considering the risk of hilar involvement.

In a recent paper, Dejima and colleagues reported the value of the total lesion glycolysis (TLG) and modified TLG (mTLG) to detect hilar metastases (station 12u) in upper lobe non-small cell lung cancer, using a mixed metabolic and morphological parameter (7). In detail, TLG is calculated by multiplication of the mean standardized uptake value ( $SUV_{mean}$ ) with the metabolic tumor volume (MTV), and it was previously used as metabolic parameter in other cancers (8). They differentiated the TGL on the basis of kind morphological analysis: TLG and modified TLG (mTLG) were calculated as  $SUV_{mean} \times MTV$  and  $SUV_{mean} \times \text{volume measured by CT}$ , respectively.

In particular, they also performed a comparison between TLG, mTLG,  $SUV_{max}$  and lymph node short axis in hilar nodes metastases assessment, and reported the superiority of the mTLG compared to the other two parameters (usually used in this setting), with an area under the curve (AUC) at ROC analysis of 0.87 for TGL, 0.79 for short axis and 0.77 for  $SUV_{max}$ .

Considering the characteristic of the patients reported in the paper, this parameter may be useful to plan surgical treatment especially in patients with solid T1b-c nodules. Indeed, the author did not report node metastases in case of GGO, part solid nodules or tumors less than 1 centimeter, finding nodal involvement only in patients with T1b-c solid cancer.

At the start of the art, sub-lobar anatomic resection in patients with solid nodule are indicated if tumor dimension is less than 2 centimeters and without nodal involvement, while in the other cases lobectomy with lymphadenectomy remains the indicated treatment (2,3).

Independently from the primitive tumor characteristics, the lymph node assessment remains one of the most intriguing issue regarding the effectiveness of sub-lobar resections, with usually a smaller number of sampled nodes than lobectomies to that may explain the differences in survival or recurrence rate in some studies (9,10). On the other hand, when the extent of lymphadenectomy is compared, the differences in survival between lobectomy and segmentectomy disappeared (11,12).

Another interesting point is that, especially in wedge resections, the lymph node assessment may regard the mediastinal stations, without analysis of the N1 stations for the technical difficulties due the absence of hilar dissection. As previously mentioned, a lack in N1 metastases identification may lead to an incomplete treatment due the absence of adjuvant therapies administration.

For these reasons, a parameter able to individuate suspect hilar involvement may be used to plan the appropriate surgical treatment in terms of lung resection and lymphadenectomy.

In particular, mTLG presented a high negative predicting value (96%), and its performance in terms of positive predicting value increases in case of asymmetric hilar uptake, resulting a better prognostic factor to individuate hilar nodal involvement compared to short axis and  $SUV_{max}$  that are usually used for this scope.

The correct preoperative node assessment may permit to plan tailored surgery in patients with T1b-c tumor or compromised lung function in many ways. Indeed, if hilar stations are suspected for nodal involvement in healthy patients with normal lung function, lobectomy remains the treatment of choice independently by the tumor diameter. On the other hand, if negative, segmentectomy plus hilar and mediastinal lymphadenectomy may be a valid alternative, and may be the treatment of choice also in patients with a limited pulmonary function and suspected

hilar node involvement. Conversely, wedge resection in this class of fragile patients may be considered only in case of low risk of N1 metastases.

We are living in fervent period with particular attention to the quality of life of our patients, in which new technologies in minimally invasive approach permit to perform surgery with a very limited impact on patient's performance status. Also for this reason, there is a renovate interest to sub-lobar resections with the aim to obtain an excellent oncological result without damages on the quality of life of these patients.

Total lesion glycolysis may represent one of these innovations that permits to identify patients' candidate to sub-lobar resection, improving preoperative staging and reducing the risk of incorrect treatment.

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### Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

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