

Anatomic bisegmentectomy for synchronous lung adenocarcinoma

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Abstract: Modern thoracic surgery requires the ability to manage patients with ground glass opacities (GGO). However, due to the lack of a standardize approach in our institution these cases are discussed in the tumor board. We here present our therapeutic rationale in a case of a patient with multiple GGOs, who underwent an en-bloc anatomic bisegmentectomy as surgical treatment for a synchronous lung adenocarcinoma.

Keywords: Lung; lung cancer; anatomic segmentectomy; bisegmentectomy; ground glass opacity; ground glass opacities (GGO)

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Introduction

The ongoing evolution of radiologic imaging techniques has allowed a precise correlation between lung histology and computer tomography imaging. Radiologic descriptions of ground glass opacity (GGO) with or without solid components directly correlate (1) with the latest adenocarcinoma classification (2) and so far, with oncologic prognosis. The clinical assessment of these opacities, the location, the number of lesions and the ratio of solid component define the proper surgical approach. We are frequently challenged with patients with not only a single GGO, but also multiple GGOs requiring a case-by-case strategy. This is the case report of a patient with multiple GGOs.

Case presentation

An asymptomatic 72-year-old female, previous smoker (quit 30 years ago), without significant comorbidities, presented with multiple GGOs with three dominant lesions. The major lesion was in the superior segment of the right lower lobe (RLL). It measured 3.4 cm, with mixed GGO and a 1.5 cm solid component, with a standardized uptake value (SUV) of 3.3 on positron emission tomography (PET). The second lesion was in the posterior segment of the right

upper lobe (RUL), measured about 1cm and was inactive on PET. The third lesion was in the posterior segment of the left upper lobe, also measured 1cm and was inactive on PET. There were other multiple infracentimetric GGOs in both lungs, without mediastinal lymph node involvement or distant metastasis at computed tomography (CT)-scan or PET scan. A transthoracic needle biopsy of the RLL lesion confirmed an adenocarcinoma. A full clinical pre-operative evaluation was performed and the patient was considered fit for surgery.

Surgery

Under general anesthesia and one-lung ventilation, the patient was installed in a left lateral decubitus, with the hips flexed. Surgery was performed through single port technique, with a 4-cm incision in the 5th right intercostal space, between the anterior axillary and midaxillary lines.

After confirming resectability, both lesions of the right lung were identified. Due to the absence of posterior fissure between the RUL and the RLL, both tumors had to be resected *en bloc* to preserve oncologic principles. So, from the main artery we planned to resect towards the posterior segment of the RUL and towards the superior segment of the RLL.

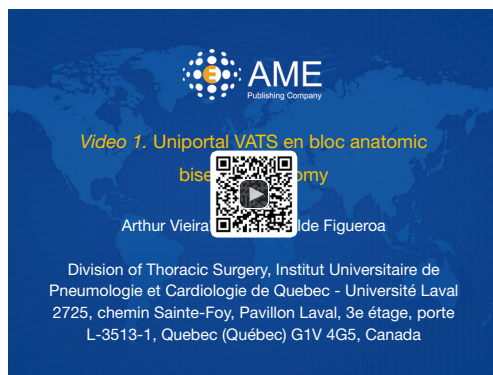


Figure 1 Uniportal VATS *en bloc* anatomic bisegmentectomy (3). Available online: <http://www.asvide.com/articles/1499>

The dissection started at the major fissure to identify the pulmonary artery and its branches. Lymphadenectomy was performed along the dissection to allow a safer and clear exposure of the vessels and also to confirm early stage disease. Only when segmental and hilar lymph nodes were proven negative the vascular branches were transected. With the help of ultrasonic scalpel and the stapler, the arterial branches of the respective segment of the RUL and of the RLL were ligated. Subsequently, the corresponding bronchus and veins. To complete the segmentectomy, the parenchyma was stapled following the intersegmental vein. Finally, intercostal nerve blockade was performed, followed by the insertion of a 24 French chest drain and full expansion of the lung (*Figure 1*).

Discussion

Since the randomized trial performed in 1995 by the Lung Cancer Study Group, lobectomy with lymphadenectomy has been established as the gold standard treatment for early stage non-small cell lung cancer (NSCLC) (4). Meanwhile, thoracic imaging techniques have evolved allowing early identification of very small NSCLC. Likewise, minimally invasive thoracic surgery grew to become the standard approach to early stage lung cancer and has progressed to offer lung-sparing techniques to this very early lung cancer.

Recently, several non-randomized trials demonstrated the role of segmentectomy in the treatment of peripheral stage IA NSCLC. Current literature review suggests that certain aspects as tumor <2 cm; margin adequacy; peripheral lesion, anatomical segmentectomy rather than wedge resection; and proper lymphadenectomy correlate with improved results after sublobar resection (5-8).

Two important multi-institutional prospective randomized trials are currently underway to clarify if sublobar resection offers similar overall survival when compared to lobectomy for the peripheral early stage NSCLC (9,10). Only the Japanese trial has completed accrual, and the results from these two trials are expected in the years to come.

In our institution, patients with multiple GGO are presented at the tumor board and a conjoint decision is made. If a dominant lesion is identified or one lesion is progressing, a lung sparing surgery will be proposed, ideally anatomic segmentectomy with lymph node sampling. This case represents well our proposed strategy to this type of cancer. The right lung was approached first for a posterior segmentectomy of the RUL and superior segmentectomy of the RLL (segment S6). Once the patient recovers from this intervention, most probably she will undergo a left upper segmentectomy.

Conclusions

In this patient with multiple GGO lesions, we proposed an anatomic segmentectomy through a minimally invasive approach. Segmentectomy is a challenging procedure that requires a profound knowledge of anatomy and technical expertise in minimally invasive surgery. Bisegmentectomy was the optimal procedure to treat this multiple early stage adenocarcinoma that has a very favorable oncologic prognosis.

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None.

Footnote

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

Informed consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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