

## Uniportal video-assisted thoracoscopic surgery wedge lung biopsy in the diagnosis of interstitial lung diseases

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**U**niportal lung biopsy by video-assisted thoracoscopic surgery (VATS) has recently been introduced as an acceptable alternative to the traditional three-port VATS.<sup>1</sup> This is an institutional review of the preliminary experience with uniportal VATS to diagnose interstitial lung conditions.

### Methods

Between January 2000 and April 2004, a total of 20 patients underwent wedge pulmonary resection by uniportal VATS for diagnosis of suspected interstitial lung diseases according to a standardized technique described elsewhere.<sup>1</sup> In brief, only one incision (2-2.5 cm long) is placed in the chest opposite to the target area to be sampled for biopsy. As a rule, the fourth or fifth intercostal space in the midposterior axillary line is selected for wedge biopsy of the apical and basal segments of the lower lobe, and the sixth intercostal space in the scapular line is selected for the middle lobe and the lingula. A 5-mm thoracoscope is routinely used, along with roticulating grasping and stapling instruments, while the target areas are approached along a sagittal plane, developing the entire procedure according to a craniocaudal perspective<sup>1</sup> (Figure 1). The specimen is removed from the chest with an endobag and injected with formalin to avoid collapse of the diseased alveoli and histologic artifacts.

We used this technique in 11 male and 9 female patients with a median age of 56 years (range 32-80 years). Preoperative median forced expiratory volume in 1 second was 2.14 L (range 1.17-3.21 L). The median forced expiratory volume in 1 second and diffusing capacity of lung for carbon monoxide percentage values were 74% (range 54%-101%) and 58% (range 39%-79%), respectively.

### Results

Neither mortality nor major morbidity was observed, apart from prolonged air leaks (5 days) seen in 1 patient. The median chest

drain duration and hospital stay were 1 day (range 1-6 days) and 2.5 days (range 1-6 days), respectively. Each procedure included a median of 2 wedge lung biopsies (range 1-4). The target areas, alone or in combination, were the right upper lobe in 5 patients, the right lower lobe in 12, the right middle lobe in 2, the lingula in 5, the left upper lobe in 2, and the left upper lobe in 4.

The median size of the specimens was 43 mm (range 20-124 mm) by 22 mm (range 8-50 mm) by 10 mm (range 3-20 mm). The final pathologic diagnoses were as follows: cryptogenic fibrosing alveolitis (5 patients), nonspecific interstitial pneumonia (4 patients), extrinsic allergic alveolitis (3 patients), sarcoidosis (2 patients), histiocytosis X (2 patients), usual interstitial pneumonia (2 patients), and pulmonary hypertension and metastatic lymphangitis from lung cancer (1 patient each). As a consequence of the biopsy results, the therapeutic management was altered in 14 cases (70%).

### Discussion

Unlike with minithoracotomy but similar to the classic three-port approach, uniportal VATS lung biopsy may provide enough pulmonary tissue to facilitate the diagnosis by selecting, if needed, parenchymal areas different than the usual middle lobe or lingula.<sup>2,3</sup> In addition, the uniportal VATS approach may offer intuitive



Figure 1. Intraoperative illustration showing uniportal VATS wedge resection of the lingula.

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advantages relative to the previously mentioned techniques in terms of postoperative pain and length of hospital stay.<sup>1</sup> Recently, chest wall paresthesia has been described as a significant postoperative complication of the standard VATS approach,<sup>4</sup> which may be reduced by limiting the number of port incisions.

The postoperative course of the patient subjected to lung biopsy is usually uneventful, and the hospital stay is short.<sup>2</sup> In this context, the use of uniportal VATS in awake patients receiving epidural analgesia may contribute in the future to routine performance of this procedure on an outpatient basis.<sup>5</sup> The main disadvantage of uniportal VATS resides in the costs of the instrumentation<sup>1</sup> (currently used also during standard VATS), which may be offset by a further reduction in the postoperative stay.<sup>1,2</sup>

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