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Manuscript Title:

Thoracoscopic segmentectomy and lobectomy assisted by three-dimensional computed-tomography bronchography and angiography for the treatment of primary lung cancer

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Abstract:

Background. This study aimed to assess the safety and feasibility of three-dimensional computed-tomography bronchography and angiography (3D-CTBA) in performing video-assisted thoracoscopic surgery (VATS) for lung cancers.

Methods. In this study, we enrolled 123 patients who consented to undergo thoracoscopic segmentectomy and lobectomy assisted by 3D-CTBA between May 2017 and June 2019. Using Mimics software, we reconstructed image data from enhanced computed-tomography (CT) scans in three dimensions. The results of preoperative 3D-CTBA, in combination with intraoperative navigation, guided the surgery.

Results. A total of 59 women and 64 men were enrolled, of whom 57 (46.3%) underwent segmentectomy and 66 (53.7%) underwent lobectomy. The majority of tumor appearance on CT was mixed ground-glass opacity (mGGO; 55.3%). The mean duration of chest intubation was 3.5 ± 1.6 days, and the length of postoperative hospital stay was 6.8 ± 1.8 days, on average. Regarding surgical complications, we encountered six chylothoraces and one pneumonia. Three patients suffered from prolonged air leak lasting >5 days. Notably, there was no intraoperative massive hemorrhage or 30-day mortality.

Conclusions. VATS and 3D-CTBA worked in harmony in our study. This combination also provided a new pattern of transition from lesion-directed location of tumors to computer-aided surgery for the management of early lung cancer.

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