Thoracoscopic Anatomic Left S1+2ab Subsegmentectomy with the Central Vein Type in Left Upper Pulmonary Vein

Objective: While segmentectomy has been widely performed for small-sized lung cancer, identification of the pulmonary vein is important during this procedure. Left S1+2 segmentectomy has often been performed among all segmentectomies and the left upper pulmonary vein has some variations in the branch pattern. Although most patterns of the pulmonary vein are the apical type, the central vein type is very rare (approximately: 2%), and the S1+2 segmentectomy with the central vein type is assumed to be difficult because the anatomic dissection from the hilum site using the pulmonary vein as a demarcation is impossible. We present the left S1+2ab subsegmentectomy referring to pleurography and vascular reconstruction in order to overcome this difficulty.
Case Video Summary: A 75-year-old man was admitted with a suspicion of lung cancer that showed a 1.0 cm-solid nodule on the left S1+2b subsegment. The pattern of this patient's pulmonary vein was the central vein type in the left upper pulmonary vein. Therefore, we planned thoracoscopic left S1+2ab subsegmentectomy pre- and intra-operatively using three-dimensional computed tomography simulation combined with pleurography and pulmonary vascular reconstruction. Under the four-ports access, subsegmental arteries (A1+2ab) were first divided, then subsegmental bronchi (B1+2ab) were dissected. The bronchi were closed with a slip-knot using a monofilament thread after both lungs were inflated (Slip-knot technique). The bronchi were then divided with a stapler. The inflation-deflation line could be gradually identified as the inter-segmental line. Third, the parenchyma between S1+2a and S3c was divided using a stapler along the inflation-deflation line and the line connecting the root of A3 and the concave portion of the apical pleura (as shown by the preoperative 3D-CT simulation: Figure.) After this parenchymal division, it became possible to proceed to the next steps of dividing the pulmonary vein. Intra-segmental veins (V1+2a and V1+2b) were divided using an energy device, and the parenchyma between S1+2b and S1+2c was divided along the inter-subsegmental vein (V1+2c). The peripheral parenchyma was finally divided using a stapler. The frozen section revealed adenocarcinoma. The long surgical time of 378 minutes and the bleeding of 137 ml was due to the adhesiolysis process of dense whole lung adhesion. Chest tube was removed on post-operative day 1. Post-operative hospital stay was 4 days.
Conclusion: Three-dimensional computed tomography simulation using both pleurography and vascular reconstruction can be simple and safe to perform thoracoscopic anatomic S1+2ab subsegmentectomy with a central vein type.

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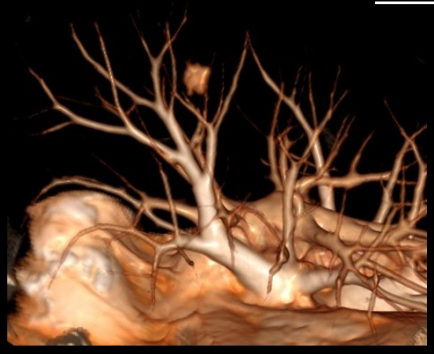
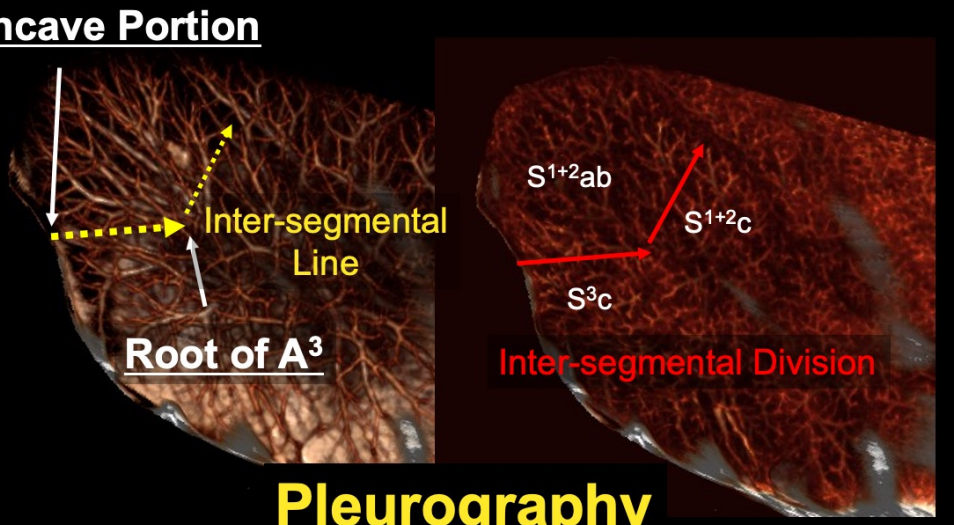
3D-CT Simulation



Vascular Reconstruction



Pleurography