



Technical aspects of biportal video assisted thoracoscopic right S3 segmentectomy of the lung

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Abstract: The technical aspects of the biportal anterior approach for right anterior anatomic segmentectomy are described with particular emphasis to meticulous dissection and exposure of the segmental hilar structures. The key step is the identification of the arterial branches to the anterior segment and after their division of the B3 segmental bronchus.

Keywords: Anterior segmentectomy; video assisted thoracoscopic (VATS); S3 segmentectomy; lung resection

Received: 02 June 2018; Accepted: 26 June 2018; Published: 17 July 2018.

doi: 10.21037/jovs.2018.06.19

View this article at: <http://dx.doi.org/10.21037/jovs.2018.06.19>

General principles

As a rule, we perform VATS anatomic segmentectomies through a biportal approach, including a 3–4 cm anterior utility incision and another 1.5 cm inferior port.

We utilize a 5 or 10 mm, 30-degree angled HD video-thoracoscope.

The surgeon and the assistant are usually positioned on the anterior (abdominal) side of the patient. The surgeon can change position and place himself cranially or caudally with respect to the assistant depending on the different steps of the operation.

Initially, the anterior utility incision is made and the wound is protected by a plastic soft tissue retractor (wound protector) kept in place by a ring in the chest cavity and one outside the skin (Alexis Retractor, Applied Medical, USA). This incision is usually placed at the 4th–5th intercostal space between the tip of the scapula and the breast in the anterior axillary line.

A second 1.5 cm port is positioned more posteriorly at the level of the 7th intercostal space just anterior to a straight line down from the tip of the scapula and is performed under endoscopic guidance using the thoracoscope through the utility incision made previously.

Operative steps

Approach for right S3 segmentectomy is similar to a right

upper lobectomy. The surgeon and the assistant stand at the abdominal side of the patient. Camera is introduced through the utility incision and the inferior port is used for insertion of a lung grasping instrument and the endoscopic staplers if appropriate. Dissection begins from the anterior part of the hilum with exposure of the superior pulmonary vein and its branches. As shown in the video (*Figure 1*), isolation and retraction of the V1 vein assists in exposure of the truncus anterior and the A3 segmental artery. Dissection can be performed using monopolar diathermy with protected tip or energy device while the use of suction device maintains the surgical field dry. Dissection and division of the V3 vein is carried out using endoscopic stapler device from the inferior port. Development of the horizontal fissure may facilitate better exposure of the hilar vessels as demonstrated in the video.

The next step is the dissection of the A3 segmental artery, which is encircled and divided with the stapler, again from the inferior port which favors a better angle as shown in the video. After division of the A3 artery the bronchus for the anterior segment (B3) is dissected free from the surrounding tissues, encircled and divided using endoscopic stapler. Before division of the segmental bronchus, the anesthetist is asked to re-inflate the lung to identify the intersegmental plane. An additional V3 branch from the V1 branch is then dissected with a right-angle instrument and divided using the endoscopic from the utility incision. The



Figure 1 Technical aspects of biportal video assisted thoracoscopic right S3 segmentectomy of the lung (1).

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posterior part of the horizontal fissure is then completed with endoscopic stapler.

Occasionally an additional segmental artery for the anterior segment (A3a) may arise from the truncus intermedius as in the case presented in the video. This has to be dissected and divided in a similar fashion.

The final step of the right anterior segmentectomy is the division of the parenchymal intersegmental plane with the use of endoscopic staplers along the inflation-deflation line. The specimen is removed using a protective bag from the utility incision. A systematic lymph node sampling is the final step of the procedure.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Journal of Visualized Surgery* for the series “Uncommon Segmentectomies”. The article has

doi: 10.21037/jovs.2018.06.19

Cite this article as: Brunelli A, Konstantinidis K. Technical aspects of biportal video assisted thoracoscopic right S3 segmentectomy of the lung. *J Vis Surg* 2018;4:147.

undergone external peer review.

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/jovs.2018.06.19>). The series “Uncommon Segmentectomies” was commissioned by the editorial office without any funding or sponsorship. AB served as the unpaid Guest Editor of the series and serves as an unpaid editorial board member of *Journal of Visualized Surgery* from Dec 2016 to Nov 2018. The authors have no other conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013).

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