Traditional thoracoscopic strategies using two to four ports has been demonstrated to be oncologically successful for patients with resectable lung cancer, with numerous advantages over thoracotomy. A single-incision approach has been described, but it is associated with potential disadvantages. The modified uniportal approach described may address those disadvantageous, with retention of the potential advantages of using a single incision.

Video-assisted thoracoscopic surgery (VATS) describes resection for pulmonary pathologic conditions by use of a minimally invasive method wherein visualization is dependent on video monitors and rib spreading is avoided [1–4]. There has been much experience with this technique, with the proven benefits of VATS lung resection responsible for the increase in its clinical use [1–5]. VATS lobectomy has traditionally been performed by the use of two to four incisions [1–5]. Uniportal access for VATS was first described in 2004 by Rocco and colleagues [6], and this strategy has been used for numerous indications, including lobectomy [7].

We have been using a two-incision VATS for anatomic pulmonary resection since 1999 [1, 3–5]. Although the potential advantages of a one-incision (uniportal) approach have not been demonstrated to date, it does seem reasonable to consider that the use of only one incision and only one interspace may result in less pain. However, the uniportal approach has two important disadvantages: the camera competes for the same space with the multiple operating instruments needed for lobectomy, and the single incision must be closed around a chest tube. We have recently developed a modified uniportal approach, using a small 5-mm counterincision in the same interspace adjacent to the operating incision, which keeps the camera separate from the operating instruments and gives the chest tube its own incision.

Technique

The reoperative setup for the modified uniportal VATS technique is the same as our classic VATS procedure [1]. The patient is under general anesthesia with single-lung ventilation (either dual-lumen endotracheal tubes or bronchial blocker) and is positioned in a full lateral decubitus position with slight flexion of the table at the level of the middle of the chest, which allows slight splaying of the ribs to improve exposure in the absence of rib spreading [1, 3]. We prefer using the fifth intercostal space, which is known to be wider, thus allowing for both better exposure and easier retrieval of specimens. A 4-cm “access incision” is made anteriorly, and the fifth intercostal space is opened, approximately 1 cm more anterior and posterior than the extent of the skin incision (Fig 1). Adjacent and posterior to the incision, a 5-mm “camera port incision” is made (Fig 2). A 5-mm 30° thoracoscope is placed within a trocar. The camera is operated by a team member standing at the back side of the patient, and the surgeon stands at the patient’s anterior side (Fig 3).

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Address correspondence to Dr Kara, Department of Surgery, Division of Thoracic Surgery, Duke University Medical Center, Box 3496, Durham, NC 27710; e-mail: volkan_kara@yahoo.com.

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Hilar dissection is carried out through the anterior incision, as with the standard two-incision VATS resection. Dissection of the pulmonary vessels and bronchi is performed beginning anteriorly and continuing posteriorly. Endoscopic linear staplers are used for individual vessel and bronchial ligation. Once the lobe is completely resected, it is placed in a specimen bag for retrieval to avoid implantation of tumor cells into the incision. We also perform systematic mediastinal lymph node dissection. A single 24F chest tube for drainage is inserted in the camera incision with a single stitch to be tied as the tube is removed. The anterior incision is sutured subcutaneously with absorbable material.

Comment

Our classic approach to thoracoscopic lobectomy has been through two incisions, placing a 10-mm 30° thoracoscope in the seventh or eighth intercostal space in the midaxillary line, and a 4- to 5-cm anterior utility incision is placed in the fifth intercostal space [1, 3]. With increasing knowledge and experience with this method, we have been performing the most advanced cases successfully, including pneumonectomy, hybrid thoracoscopic lobectomy with chest wall resection [8], and bronchoplastic resection.

Several authors have described a single-incision approach for thoracoscopic lobectomy [6, 7], but there have been no reported advantages over a two-incision approach to date. In addition, the standard uniportal approaches are associated with these potential disadvantages: (1) the camera competes with the operative instruments, and (2) the chest tube needs to be incorporated within the 4- to 6-cm access incision.

The modified uniportal VATS technique described herein addresses both of these potential disadvantages by creating a small incision adjacent to the access incision, using the same (fifth) intercostal space. Although it is acknowledged that a single intercostal space approach has not been proved to be advantageous in terms of pain and recovery, it does seem reasonable to limit the procedure to one intercostal space in selected procedures. We have operated on approximately 40 to 50 patients with this technique and have the impression that the lower lobes are easier to complete because there is less need to direct the stapler from a more medial port.

As advances in camera and instrumentation develop, the modified uniportal technique will become even more efficient. Outcome studies should be performed, however, to confirm the advantages of the uniportal approach.
over more traditional and established thoracoscopic approaches.

References