Simultaneous double video mediastinoscopy and video mediastinotomy—a step forward

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1. Introduction

The assessment of mediastinal lymph nodes plays a fundamental role in diagnosis, staging and management of lung cancer. Since Carlens described mediastinoscopy in 1961, the procedure has become the ‘gold standard’ for assessment of mediastinal lymph nodes [1-3]. Anterior mediastinotomy or Chamberlain’s procedure has been used to access the sub-aortic, aorto-pulmonary window and hilar lymph nodal groups. These procedures can be combined to provide excellent information regarding T and N status. We describe a novel method of using the video-mediastinoscope for concurrent cervical mediastinotomy and anterior mediastinoscopy.

2. Procedure

We have been routinely using the KARL STORZ LERUT Video Mediastroscope for cervical mediastinoscopy for the last 14 months. It is 15 cm long and equipped with a DCI-HOPKINS® forward-oblique 30° telescope and a direct coupled interface (DCI) camera head. It also comes with a KARL STORZ Endovision DCI Endoscopic system consisting of the camera and various connections.

We have performed five concurrent procedures using this system. All patients were males with lung tumours, in whom pre-operative radiological staging revealed mediastinal lymphadenopathy (four patients) and possible pericardial involvement (one patient). Hence, routine cervical mediastinoscopy was followed by a left anterior videomediastinotomy.

In two patients, the sub-aortic lymph nodes were positive precluding curative surgery. In two others all mediastinal lymph nodes were free of disease and curative surgery was performed with the same anaesthetic.

The fifth patient was a 74-year-old asymptomatic male found incidentally to have a large lingular mass on the chest radiogram. Computerised Tomography confirmed a lingular mass abutting the pericardium and mediastinal lymphadenopathy (Fig. 1). Cervical Mediastinoscopy and biopsy of paratracheal and sub-carinal lymph nodes were negative. We proceeded to an anterior videomediastinotomy coupled with direct intrapericardial inspection to assess the extent of pericardial involvement (Fig. 2).

In all patients the procedure is done via a 2.5-3 cm horizontal incision over the left third intercostal space lateral to the sternum. The pectoralis muscle fibres are separated and not divided. Diathermy is utilised to lift...
the intercostal muscles from the superior border of the fourth rib until the parietal pleura or fat is visible. Blunt dissection is thereafter commenced taking care to avoid the internal mammary vessels medially. The parietal pleura is easily dissected off the posterior periosteum and mediastinum medially and the dissection creates a tunnel lateral and superior to the pulmonary artery towards the (A-P) window. Bidigital palpation is performed with the left index finger through the mediastinoscopy incision posterior to the aorta and the right index finger through the extra pleural tunnel pointing towards the A-P window. The A-P nodes can be gently palpated in between the tips of the index fingers. As soon as the anatomy is well established the shaft of the videomediastinoscope is introduced and biopsies performed gently to avoid recurrent nerve injury and bleeding. In cases of uncomfortable bleeding, diathermy is not to be utilised and the area is tamponaded with a dressing allowing ample time for natural haemostasis.

The parietal pleura is violated only when tumour biopsies are necessary. For intrapericardial inspection the pericardium is divided at the medial end of the modified Chamberlain incision where it surfaces under the sternum. An initial small incision is performed until pericardium ‘sweats’ through it. It is thereafter enlarged enough to accommodate the shaft of the videomediastinoscope.

In all cases, the procedures are carried out under the same anaesthetic sequentially with the videomediastinoscopy through a cervical skin crease incision and the anterior video mediastinotomy through an incision over the third costal cartilage. In our experience the video mediastinoscope has provided an excellent visualisation of the nodes, the primary mass and pericardial invasion with minimal trauma and prevented an exploratory thoracotomy in all patients.

3. Comments

The video mediastinoscope allows safe and ergonomic handling and provides simultaneous image and light transmission. This makes it easier for all the theatre personnel to follow the procedure as it is being carried out. The magnification (17×) provided by the scope allows better visualisation of the anatomy. This is vital, as the dissection is often fraught with a significant risk of injury to major neuro-vascular structures in the vicinity during both procedures. This technique has significant advantages over combining video mediastinoscopy and video-assisted thoracoscopic surgery (VATS) as it allows bimanual palpation of sub-aortic lymph nodes; can be performed in the presence of pleural adhesions; patient does not need re-positioning; VATS equipment is not required.

Our experience demonstrates the benefits of the video mediastinoscope when combined cervical and anterior mediastinal assessment is required.

i. The Chamberlain incision is reduced to a minimum.
ii. Extrapleural dissection is safe and easy.
iii. Costal cartilage resection is not required.
iv. The dissection field is well stented by the shaft of the scope.
v. The length of the shaft allows good access to the A-P window nodes.
vi. It provides an excellent training tool.
vii. It can be recorded and reproduced.
viii. All concerned theatre personnel are involved in the procedure.

Thoracic surgeons have become well versed with the needs and challenges of minimal-access surgery over the last two decades with the proliferation of VATS. The skills that one gathers in the course of mastering VATS makes us adept at handling the video mediastinoscope for both cervical and anterior mediastinoscopy. Hence, we believe that video
mediastinoscopy and video mediastinotomy is a vital tool in selected cases and governs some patients from unnecessary open procedures.

Appendix. Supplementary Material

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.ejcts.2005.01.052.

References

