Video-assisted thoracoscopic thymectomy

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Clinical vignette

A 70-year-old female was referred after an incidental discovery of an anterior mediastinal mass on a computed tomography (CT) scan taken after a fall. A repeat CT scan demonstrated that the mass was increasing in size, and the patient was offered resection by video-assisted thoracoscopic surgery (VATS). She had no evidence of myasthenia gravis (*Figure 1*).

Surgical procedure

Preparation

Access from the right chest is generally easier. In this case however, the thymoma was predominantly left-sided and therefore a left-sided approach was preferred. The anesthetist places a double lumen tube to allow isolation of the required lung.

The patient is placed with the chest elevated to an angle of around 30 degrees. This allows the plane between the sternum and thymus to be developed easily, while minimizing instrument clashes. The arm lies secured beside the chest (2).

The chest wall is prepared from the posterior axillary fold to beyond the sternum, and from the jugular notch to just below the xiphisternum. This leaves the entire sternum exposed, making quick conversion to sternotomy possible if needed.

Operation

We use a 10-mm 30-degree thoracoscope with a high definition camera head and stack (Karl Storz, Germany). There are a number of approaches for port placement. In this case, a three port technique was employed with a 12-mm camera port and two 5 mm working ports placed in the submammary line along the lateral chest wall before applying gas insufflation. Alternatively, a two-port approach can be used: a camera port and a working port, held open with a soft tissue retractor (Alexis, Applied Medical, CA, USA). This protects the wound edge and allows use of the suction without re-inflating the lung. Gas insufflation is not necessary with this technique.

Using an energy device such as the Ligasure (Covidien, Dublin, Ireland) speeds up surgery, since blunt dissection, haemostasis and tissue division are possible without changing instruments.

We start by identifying the phrenic nerve. The mediastinal pleura is opened just above the nerve. The incision is extended from the level of the innominate vein to the limit of the inferior pole of the thymus.

The plane between thymus and pericardium is usually clear and relatively avascular. The contralateral pleura is identified. It is not essential to preserve it, but take care not to injure the phrenic nerve. The nerve is at most risk at the cranial extent of the incision. It is also in this area where small lateral arterial feeding vessels are found, which must be carefully cauterised.

With the plane between pericardium and thymus fully developed, any remaining attachment to the chest wall and pleural reflection is divided using the Ligasure, carefully controlling any small feeding vessels form the mammary artery.

With the thymus gland mobile, it is retracted inferiorly and towards the contralateral side, making identification of the thymic veins easier. There are usually two principal branches, draining into the inferior aspect of the innominate

Figure 1 Video-assisted thoracoscopic thymectomy (1). Available online: http://www.asvide.com/articles/722

vein. They are carefully dissected and generally ligated with 5 mm Hemolock clips (Ligasure can be used on the specimen side) before division.

Lastly, the superior poles of the thyroid are mobilised and followed superiorly. These can often be retracted inferiorly very effectively, once the gland has been mobilized. They are ligaclipped superiorly and divided.

The specimen is then retrieved via the working post using a retrieval bag (EndoCatch, Covidien, Dublin, Ireland).

Local anesthetic is injected into the intercostal spaces at multiple levels under direct vision, with 2 mL of chirocaine per space being sufficient. The 30-degree thoracoscope is angled laterally.

Lastly, a 24 French intercostal drain is placed under direct vision. Its tip is laid in the thymic bed anterior to the pericardium. We ensure that some side holes lie in the pleural space. If the contralateral pleura have been opened, the tip is placed through the defect to drain both pleural spaces.

The lung is re-inflated under vision, and the drain secured with a No. 1 prolene suture.

Comment

Clinical results and advantages

Our group has undertaken 32 VATS mediastinal resections over the last three years. The advantages of a minimally invasive approach may be decreased post-operative pain (and subsequently early mobilization) as well as excellent visualization of the thymoma, especially on the side of the incision (3,4). The ipsilateral phrenic nerve is easily visualized. By avoiding anterior chest or neck scars, the cosmetic result is very good.

Caveats

Disadvantages include potential difficulty in managing thymic vein bleeding, which may require conversion to an open approach. Furthermore, access to the superior pole of the thymoma is more difficult with a VATS approach when compared to open. The contralateral phrenic nerve can be difficult to visualize. When particularly concerned, it is sometimes necessary to site a single contralateral camera port to identify the course of the nerve. Large (>5 cm) and advanced (Masaoka-Koga stage 3 or more) tumors are difficult to excise thoracoscopically.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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