Video-assisted transcervical thymectomy for myasthenia gravis

Laura Donahoe, Shaf Keshavjee

Division of Thoracic Surgery, Toronto General Hospital, University Health Network, University of Toronto, Toronto, ON, Canada

Correspondence to: Shaf Keshavjee, MD. Professor, Division of Thoracic Surgery, Toronto General Hospital, 200 Elizabeth Street, 9N-946, Toronto, ON M5G 2C4, Canada. Email: shaf.keshavjee@uhn.ca.

Submitted Aug 18, 2015. Accepted for publication Sep 29, 2015.
doi: 10.3978/j.issn.2225-319X.2015.10.05
View this article at: http://dx.doi.org/10.3978/j.issn.2225-319X.2015.10.05

Clinical vignette

A 49-year-old female presents with ptosis, diplopia and dysphagia and is diagnosed with myasthenia gravis by electromyography (*Figure 1*). The patient reports some improvement of her symptoms with pyridostigmine, but due to increasing symptoms, she has been placed on prednisone and mycophenolate mofetil. She is otherwise healthy and takes no other medications. Computed tomography imaging shows normal thymic tissue with no thymoma. She is referred by her neurologist for consideration of thymectomy to treat her myasthenia gravis.

Surgical techniques

Preparation

The patient is positioned in the supine position with the neck extended. An inflatable bag is placed between the scapulae and inflated once the patient is anaesthetized.

Exposure

A 5-cm transverse curvilinear incision is made one finger-breadth above the clavicular heads in sternal notch. The platysma is divided and the strap muscles are split in the midline. Blunt dissection is used to clear the posterior aspect of the manubrium. A Cooper retractor is then placed to elevate the sternum anteriorly.

Operation

To begin, the superior pole of the thymus is identified. This is accomplished by following the anterior border of the thymus laterally and sharply dissecting the gland off the medial border of the sternomastoid muscle. Small perforating vessels are cauterized between forceps, taking care to avoid the use of cautery near the recurrent laryngeal nerves. The dissection is carried superiorly until the upper pole of the thymus is clearly seen. Once skeletonized, the upper pole is divided between clamps and a long suture is placed on the specimen side to aid retraction. The same technique is performed on the opposite side. In order to aid with orientation of the specimen as the surgery progresses, a straight instrument is placed on the suture around the right superior pole, and a curved instrument is placed on the suture around the left superior pole.

Next, blunt dissection is used to dissect the thymus anteriorly from the posterior border of the sternum until the pericardium is clearly seen at the inferior edge of the gland. The thymus is then bluntly dissected from the pleura laterally. Once fully mobilized anteriorly, the upper pole stay-sutures are retracted anteriorly over the cross bar of the Cooper retractor to bring the thymus up to the sternum. Blunt dissection is then used to identify and dissect the thymus off of the innominate vein and pericardium posteriorly. The thymic veins draining into the innominate vein are clipped and divided. The gland is then fully mobilized.

Completion

Once the gland is free from all surrounding structures, it is removed and sent to pathology. Hemostasis is ensured. A 7-mm Jackson-Pratt drain is placed through a separate incision into the mediastinum and the incision is closed in layers.

Figure 1 Video-assisted transcervical thymectomy for myasthenia gravis (1).
Available online: http://www.asvide.com/articles/724

Comments

Clinical results

The trans-cervical thymectomy is a minimally invasive approach to thymectomy with minimal associated morbidity. The first large series of patients who underwent thymectomy for myasthenia gravis using the trans-cervical approach was published by Kark in 1971, and showed that this technique is associated with minimal morbidity and allows complete removal of the gland (2). The first series reported from our institution included 52 patients ranged from 1977-1986 and showed a complete remission rate of 44.2% at 8.4 years (3). In a follow-up series from Toronto General Hospital of 120 consecutive patients who underwent trans-cervical thymectomy from 1991-2000, the complete remission rate was 50% at 48 months, with a similar improvement in Osserman grade (2.2±1.2) as the patients who required conversion to an upper sternotomy (1.9±1.4) (4). This is comparable to other large studies showing similar rates of complete remission for transcervical thymectomy and trans-sternal thymectomy (4-6). At our institution, the complication rate was 3.3% (four patients), and included two patients who had a myasthenic crisis requiring reintubation post-operatively, and one hemothorax and one pneumothorax, which were both treated conservatively. The average length of stay after 1994 was one day and there were no mortalities (4).

Advantages

The trans-cervical approach for thymectomy is an effective treatment for patients with myasthenia gravis with minimal associated morbidity. The length of stay is typically one day and patients can return to normal functioning soon after being discharged from hospital. Compared with the risks and recovery associated with a sternotomy, this approach provides similar results with improved short-term outcomes.

Caveats

Correct identification of the superior poles at the start of the surgery is one of the key steps in this procedure. Once identified and divided, they are used to guide the surgeon to the bulk of the gland in the chest. The procedure can be more difficult if these poles are not correctly identified at the start. The main thymic veins drain into the innominate vein, but care must be taken when dissecting over the superior vena cava because there may be small veins draining here. Also, the innominate vein must be clearly seen and the small tributaries must be fully dissected prior to division in order to prevent injury to the innominate vein. Once the specimen is removed, the mediastinum should be examined and any tissue suspected of being residual or ectopic thymus can be excised if desired to ensure removal of all potential thymic tissue.

Acknowledgements

None.

Footnote

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

References

1. Donahoe L, Keshavjee S. Video-assisted transcervical thymectomy for myasthenia gravis. Asvide 2015;2:147. Available online: http://www.asvide.com/articles/724
2. Kark AE, Kirschner PA. Total thymectomy by the transcervical approach. Br J Surg 1971;58:321-6.
3. Bril V, Kojic J, Ilse WK, et al. Long-term clinical outcome after transcervical thymectomy for myasthenia gravis. Ann Thorac Surg 1998;65:1520-2.
4. de Perrot M, Bril V, McRae K, et al. Impact of minimally invasive trans-cervical thymectomy on outcome in

patients with myasthenia gravis. Eur J Cardiothorac Surg 2003;24:677-83.
5. Calhoun RF, Ritter JH, Guthrie TJ, et al. Results of transcervical thymectomy for myasthenia gravis in 100 consecutive patients. Ann Surg 1999;230:555-9; discussion 559-61.
6. Shrager JB, Deeb ME, Mick R, et al. Transcervical thymectomy for myasthenia gravis achieves results comparable to thymectomy by sternotomy. Ann Thorac Surg 2002;74:320-6; discussion 326-7.

Cite this article as: Donahoe L, Keshavjee S. Video-assisted transcervical thymectomy for myasthenia gravis. Ann Cardiothorac Surg 2015;4(6):561-563. doi: 10.3978/j.issn.2225-319X.2015.10.05

