

Brief communication - Thoracic non-oncologic Cervico-mediastinal goiter: is telescopic exploration of the mediastinum (video mediastinoscopy) useful?☆

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Abstract

Surgeons are aware that most mediastinal goiters can be excised through a Kocher transverse collar incision, but in rare circumstances a partial-complete median sternotomy or a thoracotomy are mandatory. During an operation to remove a large cervico-mediastinal goiter (CMG) a profound, not massive, bleeding in the anterior mediastinum developed. Bleeding was unsuccessfully treated with packing. Instead, to perform an urgent sternotomy we used telescopic imaging to identify the source of hemorrhage, and a metallic clip was used to stop the bleeding. Since then we have prospectively used the telescope in the case of large CMG causing compression of an adjacent structure. This report is a preliminary communication demonstrating the technique. Telescopic exploration of the mediastinum was performed in seven patients. The goiters were located in the middle mediastinum in five patients and in the anterior and middle mediastinum in one, respectively. The use of a telescope can help the surgeon during the removal of a large mediastinal goiter. It facilitates a) the visualization of the intrathoracic tributaries reducing the risk of hemorrhage, b) the research of ectopic thyroid gland, and finally c) minimizes the risk of complications of a median sternotomy.

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1. Introduction

Surgeons are aware that most mediastinal goiters can be excised through a Kocher transverse collar incision, but in rare circumstances a partial-complete median sternotomy or a thoracotomy are mandatory [1, 2].

In recent years, the mediastinoscopic assistance has been suggested in some circumstances to avoid a sternotomy in case of mediastinal goiter [3].

Since January 2007 we have prospectively used telescopic imaging to facilitate exposure of the mediastinum during surgery for a large cervico-mediastinal goiter (CMG). This report is a preliminary communication demonstrating the technique.

2. Material and methods

In January 2007 during an operation to remove a large CMG a profound bleeding in the anterior mediastinum developed. Bleeding was unsuccessfully treated with packing. Instead, to perform an urgent sternotomy we used telescopic imaging to identify the source of hemorrhage, and a metallic clip was used to stop the bleeding. Since then we have prospectively used the telescope in the case

of a large CMG causing compression of an adjacent structure.

Telescopic exploration of the mediastinum was performed in seven patients with CMG. There were six females with a mean age of 54 years. Patients' demographics, and the location and size of the thyroids mass are listed in Table 1. One hundred and twenty-seven thyroidectomies have been performed in the same period in the endocrine surgical unit. All patients had at least half of the thyroid located substernally [4]. The goiters were located in the middle mediastinum in five patients and in the anterior and middle mediastinum in one, respectively.

3. Position of the surgeon and axillary instrumentation

The surgeon stands on the left side with the nurse on his left. The television monitor is positioned in front of the surgeon. Standard open instrumentations are used for removal of the thyroid gland. A 0° 5 mm diameter telescope is used to explore the mediastinum. The sternum is elevated with a sternum retractor suspended from a transverse bar. The sternotomy is ready on the main instruments table.

4. Surgical technique

The superior mediastinum is entered through a trans-cervical incision 2 cm above the sternal notch. The upper

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Table 1
Characteristics in seven patients requiring a video-mediastinoscopic exploration of the mediastinum during removal of cervico-mediastinal goiter

| Patient no. | Sex | Age | Location | Dimension (cm) |
|-------------|-----|-----|-----------|----------------|
| 1 | F | 47 | Anterior | 10×8×7 |
| 2 | F | 81 | Middle | 12×8×7 |
| 3 | F | 57 | Middle | 9×6×5 |
| 4 | F | 35 | Middle | 12×7×5 |
| 5 | F | 70 | Middle | 8×7×6 |
| 6 | F | 52 | Middle | 10×7×7 |
| 7 | M | 40 | Posterior | 11×9×8 |

thyroid arteries and veins are tied first. As usual care is taken to visualize the recurrent laryngeal nerve.

The index finger is used to perform the blunt dissection which is carried out in the mediastinum anteriorly, laterally and posteriorly to the gland. If the thyroid is fixed in the anterior mediastinum, to facilitate the dissection the sternum is elevated with a sternum retractor. At this point without utilizing access port the telescope is used to magnify the operative field. The optic, through the cervical incision, is inserted into the mediastinum by one assistant. Attention is taken to avoid invasion of the operating field of the primary surgeon. The thyroid can then be freed from the mediastinal pleura and posteriorly from the pericardium using dissecting tampon or yankauer suction. Difficulties can be found due to the movements of the mediastinal pleura with respiration. In the anterior mediastinum, care is taken to identify posteriorly the innominate vein, and the residual thymus gland. Small deep vessels can be in fact tied with endoclips under telescoping assistance. After the thyroid is removed the telescope is used to explore the empty mediastinal cavity to search for ectopic gland or persistent bleeding. A small drainage is inserted under video control.

5. Results

Adherence to the mediastinal pleura or vascular structures was found in all patients. No intraoperative blood loss. The patients were extubated in the operating room and remained stable with no respiratory stridor or airway compromise. No ectopic thyroid glands have been found. Postoperatively the patients did not experience postoperative complications, such as recurrent laryngeal nerve injury, bleeding, wound infection, or tracheomalacia. A transient hypocalcemia developed in one patient. The drainage was removed the first day postoperatively and all the patients were discharged on the 2nd postoperative day. Final histology showed a multinodular colloid goiter in all patients.

6. Discussion

A goiter is defined mediastinal when at least 50% of the thyroid tissue is located substernally [4]. Intrathoracic thyroid masses account for 5.8% of all mediastinal masses [5] while partial or complete mediastinal goiters represent 18% of all intrathoracic thyroid [6]. Our experience confirms that mediastinal goiters are mostly located in the anterior and middle mediastinum, and rarely in the posterior medi-

astinal compartment [7]. Most are located in the middle mediastinum, and they descend along the trachea into the mediastinum from thyroid tissue in the neck or originate from ectopic thyroid tissue in the mediastinum. This is the reason for their common association with tracheal compression and deviation.

Main indications for surgery of a CMG are the presence of a large mass causing local compression of adjacent structures, and when there is the possibility of malignancy.

Sternotomy, partial sternotomy, and right anterior thoracotomy are most frequently used for the treatment of intrathoracic thyroid masses as they offer greater exposure and access for radical excision and control of intraoperative bleeding that may occur in the mediastinum. Full or partial median sternotomy has the advantage of excellent visualization of the entire anterior mediastinum but this incision has the potential risk of wound infection, dehiscence and reduced mobility for six weeks, even more it does not give an optimal cosmetic appearance.

We agree with Tsai et al. that a mediastinal goiter may be successfully removed via a neck incision and video-mediastinoscopic assistance [3], and finally that each patient should be evaluated prior to surgery to determine if mediastinoscopic assistance can obviate the need of a sternotomy.

The use of the telescope in fact enables the mediastinum to be visualized, and it also permits to obtain vascular control of the mediastinal tributary vessels for the thyroid gland. Therefore, it can help to avoid hemorrhage which is usually an emergency to be treated appropriately [8]. In our experience, adherence to the mediastinal pleura or vascular structures were the indication for video-mediastinoscopic assistance. Of course the use of telescope assistance is not indicated in the case of massive mediastinal bleeding when a sternotomy must be performed, but this is a very rare circumstance.

In conclusion, the use of a telescope can help the surgeon during the removal of a large mediastinal goiter. It facilitates a) the visualization of the intrathoracic tributaries reducing the risk of hemorrhage, b) the research of ectopic thyroid gland, and finally c) minimizes the risks of complications of a median sternotomy.

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