

Endoscopic Right Lobectomy Axillary-breast Approach: Report of Two Cases

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Abstract

Background: We report our two initial experiences in the treatment of thyroid disease with endoscopic thyroidectomy. Minimally invasive video-assisted thyroidectomy (MIVAT) was initially introduced by Miccoli. The modification was made by using axillary and breast approach with CO₂ insufflation.

Method: A young woman patient with 5 cm right lobe thyroid disease, suspected benign. From physical examination, sonography and FNAB findings were categorized as benign case. Thyroid function test was within normal limit. She was operated with endoscopic right lobectomy. The procedure was carried out through incision of 5-10 mm axillary and breast. The right lobectomy procedure was performed by dedicated instrument. No drain needed. The pathology result was follicular carcinoma, so further treatment needed. Other patient, a woman with 4 cm right lobe thyroid cyst. FNAB proved benign, was operated with the same procedure, and pathology result was benign cyst.

Result: Duration of first operation was 300 minutes and the second one was 120 minutes, minimal blood loss, and no major complication. Patients were discharged 24 hours after operation. Cosmetic results and postoperative pain were excellent. Slight swelling on their necks was found and reduced after 48 hours. Pain around shoulder until day-7 postoperation and significantly disappeared after 10 days.

Conclusion: We reported two cases, which were operated by endoscopic right lobectomy as a safe, reproducible technique with an indication in a minority of patients/candidates to thyroidectomy and is characterized by a better postoperative discomfort. The duration of operation would be a curve learning for each surgeon who wishes to perform it.

Keywords: Endoscopic thyroidectomy, Axillary-breast approach.

INTRODUCTION

Neck surgery is one of the newest and most interesting applications of minimally invasive surgery technique in thyroid surgery, particularly with regard to eliminating the unattractive scars.^{1,2}

It is well known that conventional thyroidectomy allows prompt postoperative recovery. In some clinical settings, it is performed as an outpatient procedure. Findings have shown that video-assisted and endoscopic procedure for thyroid surgery have some advantages over conventional surgery in terms of cosmetic result and postoperative recovery. These results support the development of endoscopic and video-assisted thyroid surgery. It should be emphasized that these procedures are technically demanding and require a surgical team skilled in both endocrine and endoscopic surgery. This is particularly true for some endoscopic techniques, such as endoscopic thyroidectomy by breast or axillary approach. The endoscopic and video-assisted procedure requires a significant learning period, which can be time consuming especially at the beginning of a surgeon's experience.³

Minimal access thyroid surgery was conceived primarily in Europe and Asia.¹ Endoscopic neck surgery for the

parathyroid and thyroid was developed by Gagner and Huscher in 1996 and 1997 respectively. Since then, various methods, including axillary, breast, and anterior chest approaches have been introduced by many surgeons. The use of endoscopy for complete thyroidectomy has been viewed with concern, although many surgeons have regarded benign thyroid disease as an indication of endoscopic surgery.⁴⁻⁷

CASE ILLUSTRATION I

A 32-year-old woman with a lump on right anterior neck since a year. The lump was not tender, meat ball size, non growing, and skin over was not red. No other lump was seen around her neck or other part of the body. No other person in her community had the same symptom.

From physical examination, general condition was good. Local status showed lump on anterior neck region with no redness and size around 5 cm in diameter. The lump was firm, not tender, moved upward on swallowing and no lymph node enlargement was seen around the neck. Laboratory finding was within normal limit. Sonography and FNAB findings were concluded as benign case. She was operated with right lobectomy endoscopically. Pathologic result was

follicular carcinoma. Further treatment was needed, and she is now prepared for the completion of thyroidectomy endoscopically.

CASE ILLUSTRATION II

A 34-year-old woman with lump on right anterior neck since 6 months (Fig. 1). The lump was not tender, meat ball size, non growing, and skin over was not red. No other lump was seen around her neck or other part of the body. No other person in her community had the same symptom.

General condition was good. Local status showed lump on anterior neck region with no redness and size around 4 cm in diameter. The lump was firm, not tender, moved upward on swallowing and no lymph node enlargement was seen around the neck. Laboratory finding was within normal limit. Sonography and FNAB findings were concluded as benign cyst. She was operated with right lobectomy endoscopically. Pathologic result was benign cyst of thyroid.

METHOD

Our first two case reports includes the use of axillary-breast approach similar to Tran Ngoc Luong technique to perform endoscopic right lobectomy (Fig. 2). Under general anesthesia, those patients were placed in the supine position with neck moderately extended. The port sites were identified. At first, 10 mm longitudinal incision was made at anterior axillary region then 5 mm incision was made at circumareolar and shoulder. Later, a vascular clamp was used to create a preliminary subfascial space. A 10 mm trocar was placed at the optical port. The operating space was maintained with O₂ insufflation at a gas pressure of 10



Fig. 1: Thyroid lump on right anterior neck

to 11 mm Hg. A 10 mm, 0 degree endoscope was inserted under its guidance. We inserted other 5 mm trocar respectively. The subcutaneous tunnel was further enlarged with bipolar and hook equipment. The lateral border of sternocleidomastoideus was dissected and omohyoid was moved upward. The thyroid gland was exposed. The inferior and superior thyroid arteries were divided using harmonic scalpel. The parathyroid and RLN were routinely identified and preserved. The gland was dissected by harmonic scalpel as well.

RESULT

The duration of first operation was 300 minutes with bleeding 75 cc. We did not have frozen section facility, so we had to wait for definitive pathology result. Postoperatively, there was slight edema on the neck, pain around shoulder, and no hoarseness (RLN paralysis). Calcium level was normal. After 7 days postoperation, the pain and edema reduced. As the pathology result was follicular, the patient needed complete operation after endoscopy. The second patient was operated in 120 minutes with bleeding 30 cc. Postoperatively was bruise on the right shoulder, no hoarseness, and slight pain around shoulder. After 7 days postoperation, she had no complaint (Fig. 3).

DISCUSSION

The history began with the initial experience conducted with MIVAP (minimally invasive video-assisted parathyroidectomy) that led some authors to perform the same surgical approach for thyroidectomy. The first idea that moved to MIVAT (minimally invasive video-assisted thyroidectomy) was the better cosmetic result (an incision of 1.5-2 cm).



Fig. 2: Axillary approach for thyroidectomy

Micoli introduced this technique as a three-part procedure starting with an open technique followed by endoscopic component and then completed in an open fashion. According to some data in the literature, any surgeon approaching the MIVAT technique must carefully consider that at the beginning of his or her experience, the procedure will be significantly longer than the standard operation. From then, endoscopic thyroidectomy can be divided in two types with CO₂ insufflation or gasless. Others classified as video-assisted and total endoscopic.^{1,7,8}

Total endoscopic thyroidectomy is a more sophisticated variation of minimally invasive thyroid. Using special instrument and technique, part or all of the thyroid gland can be removed through small puncture site avoiding any incision on the neck whatsoever. In this technique, the skin overlying the collarbone is lifted from the underlying muscle and laparoscopic techniques are used to create a working space.⁸

Various approaches have been devised and improved further to fulfill this goal, mainly including the cervical approach, anterior chest approach, axillary and breast approach. However, none of these approaches is exclusively advantageous and universally accepted. The cervical approach and anterior chest approach are minimally invasive but not cosmetically excellent. The axillary and breast approaches have maximized cosmesis, but meanwhile cause much invasiveness. Furthermore, the axillary approaches are not suitable for bilateral manipulation and even more technically challenging with abnormal anatomic vision. Therefore, an axillary-bilateral-breast approach (ABBA) has been developed, which is actually a combination of the procedure. In comparison, ABBA permits bilateral exploration more space for instrument use and the removal of larger nodule. With this technique, the mean surgical time was

188 minutes, mean blood loss was 53 ml and mean hospital stay was 3.3 days. BABA (bilateral-axillary-breast approach) was introduced later and claimed to be easily applied for thyroid cancer as well.^{3,5-7,9} This technique is now even improved by using da vinci robotic system by Eun Lee et al⁶, which is useful in identification of anatomy and dissection during surgery. The function of EndoWrist instrument is beneficial in doing complex tasks in difficult areas with limited access. The mean operating time without robotic was 165 minutes and with robotic was 218.3 minutes, but there is a tendency of decrease in operation time. They also perform central node dissection and limited lateral node picking. Tran Ngoc Luong¹⁰ in 2004 modified the technique by using axillary-breast-shoulder approach. Using this technique, they can do total and other bilateral procedures, including central neck dissection. The first operating time was 420 minutes and significantly reduced mean time for lobectomy is 15 minutes and total is 30 minutes now.

The first endoscopic surgery, performed transcervically, was employed to treat a 3 mm moderately differentiated papillary microcarcinoma with focal capsular invasion in 1997. The use of a transcervical approach results in small operative scars in the neck.⁴ After this attempt, Ohgami et al¹¹ performed endoscopy via breast approach for thyroid adenoma 5 to 7 cm in diameter. Yamamoto et al¹² applied endoscopy via breast approach for Graves' disease patients. Ikeda et al¹³ applied anterior chest and axillary approach for follicular tumors, Graves' disease and papillary microcarcinoma.

Generally, endoscopic thyroid surgery has been thought to be appropriate for benign thyroid disease. First, it was indicated for nodule not more than 3 cm, benign or low grade follicular lesion and papillary carcinoma. Contra-indications were previous neck surgery, large goiter, locally metastasis, previous neck irradiation, thyroiditis and hyperthyroidism.¹⁴ These indications then slightly change during the development of the technique. Some can even perform for nodule more than 5 cm for Graves' and thyroiditis.^{4,10} The role of endoscopy for carcinoma is still in debate. In other areas of oncologic surgery, such as for gastric or colorectal carcinoma, minimally invasive laparoscopic surgery has been established through clinical experience and technical development. Similarly, endoscopic thyroid surgery can be used for malignant thyroid disease. BABA and axillary-breast approach similar to Tran Ngoc Luong technique can be used as an appropriate method for treating thyroid malignancies.^{4,6,10} Kitano et al¹⁵ reported the treatment of thyroid cancer with anterior chest approach endoscopic surgery. The indications are as follow: Age



Fig. 3: Postoperative appearance

< 45 years, tumor size < 2 cm, and no evidence of lymph node metastasis or local invasion. Miccoli et al¹⁶ showed that the completeness obtained with MIVAT for thyroid cancer not exceeding 3.5 cm in diameter is similar to that obtained with open surgery. As experience accumulates and more techniques are developed, the indication in cases of thyroid malignancy can be expanded.^{4,6}

Postoperative complications are hypocalcemia, recurrent laryngeal nerve (RLN) paralysis, bleeding, infection, and pain.^{4,5} Others, as a complication of using CO₂ insufflation, are hypercapnia, subcutaneous emphysema and severe tachycardia.^{5,17} Gottlieb et al¹⁸ reported severe increase in PaCO₂, subcutaneous emphysema, and severe tachycardia by applied insufflations at relatively high pressure (15-20 mm Hg), whereas Ochiai et al¹⁷ and Ohgami et al¹¹ reported only minimal emphysema with the use of low pressure CO₂ insufflation (6 mm Hg). Tran Ngoc Luong technique used 10 to 11 mm Hg insufflations of CO₂ without severe complication appearance. The study of the appropriate pressure to be used is still under observation.¹⁰

According to the literature, the conversion rate varies from 0 to 13%. The reasons include malignant histological result, bleeding, difficulty of dissection, size of nodule and thyroiditis. In some reports, 5 to 11% patients even required a second operation for definitive malignant pathological result.⁶

We performed our first case using axillary-breast approach similar to Tran Ngoc Luong technique. We did not find any difficulty in identifying the anatomy during operation, so we did not convert to open method. The operation time was relatively faster than the first operation which Tran Ngoc Luong did. There was minimal blood loss and no major complication was found including the effect of CO₂ insufflation. This technique was safe and feasible to perform. It provides excellent view of vital structure and has advantage over open method cosmetically, although it has learning curve. As we get more familiar, the operating time will be shorter and also extending indication for endoscopic thyroid surgery. We proved it with our second patient who was operated faster and with minimal blood loss.

CONCLUSIONS

Since its introduction and establishment in 1997, endoscopic thyroidectomy has yet to become a standard procedure. Thus, this procedure will provide another surgical choice for patients with thyroid tumors and carcinoma.

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