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HOW I DO IT

Endoscopic Thyroid Surgery through Breast and Axillary Approach

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ABSTRACT

Thyroid surgery was introduced since ages; it was initially started with large incision in the neck. Due to advancement in technology the minimally invasive surgery has been introduced for all organs. This technology is introduced in the thyroid surgery too. Different approaches have been established including minimally invasive video assisted, endoscopic, robotic and natural orifice thyroid surgery. Among these different approaches of endoscopic thyroid surgery, the breast and axillary approach is most acceptable and easy to perform. Here I am going to describe this technique of endoscopic thyroid surgery.

Keywords: Thyroid surgery, Endoscopic surgery techniques, Thyroidectomy.

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INTRODUCTION

Thyroid surgery was introduced by Theodor Kocher in 1996, after him there is continuous technical advancement in thyroid surgery, that development is possible only due to better understanding of thyroid embryology, anatomy and pathophysiology of disease process. There is evolution in techniques of capsular dissection with preservation of recurrent laryngeal nerve and parathyroid. There is also advancement in vessels sealing energy devices, including bipolar cautery, Ligasure and Harmonic scalpel. Due to these advancements in technology, the feasibility and acceptance of conventional surgery to minimally invasive surgery that includes video assisted to total endoscopic thyroid surgery has been increased among the thyroid surgeons as well as patients.[2-4] Endoscopic neck surgery was first develop for parathyroidectomy by Gagner and Huscher et al in 1996 and 1997 respectively.[1,5] There are different approaches for this endoscopic thyroid surgery including, cervical approach, axillary approach, breast approach and chest wall approach. Among these approaches the axillary and breast approach is most popular and it was originally described by Ohgami et al.[6] This technique is cosmetically most acceptable.

This manuscript describes our approach to endoscopic thyroid surgery through breast and axillary approach. This approach is most suitable for the single small thyroid nodule less than four centimeters and benign on cytology. After a fair amount of experience one can operate larger goiters with bilateral disease and papillary thyroid cancer also.

SURGICAL TECHNIQUE

Instruments

This technique is very simple, it requires only a standard set of laparoscopic instruments, which includes telescopes, common gas insufflators, light source and routine hand instruments. For dissection, we use the electro cautery, suction machine and ultrasonic vessel sealing and cutting device.

Preoperative Preparations

All patients should be adequately preoperative prepared as for the open surgery with care for preoperative comorbid conditions like diabetes, hypertension and respiratory disease. Patients' conditions should be optimized before surgery with medications.

Anesthesia

All patients require surgery under general anesthesia with single lumen flexometallic endotracheal tubes.

The hair should be removed from neck including axilla up to upper part of abdomen especially in male patients.

Position

The patient put on supine positions at 30 degree reverse trendelenburg position with sandbag under the shoulder to give extension over the neck and head is supported by head ring. The ipsilateral arm is extended up to 90º to 120º.

The arm is well padded and strapped in position. The neck, chest and ipsilateral arm is cleaned well with savlon soap solution sprit and povidone iodine lotion.

Skin Markings

After proper draping, the surface marking of clavicle, sternocleidomastoid muscle (SCM), midline of neck and tumor is done with skin marking pen.

Incision site is marked: First 10 mm port just posterior to anterior axillary line (AAL) in the axilla near lower hairline, another 10 mm port marking at the superior-medial

periareolar site on ipsilateral breast. Third 5 mm port is marked here to in the AAL 5 cm above to first port (Fig. 1).

Port Placement

1. After surface marking: the first 12 mm transverse incision is given parallel in skin crease in the axilla, the incision is deepened with artery forceps; a tunnel is created by pushing 10 mm trocar bluntly into the subcutaneous plane toward the midpoint of mid line of neck medial border of SCM. Then withdraw the trocar need to be corrected below the clavicle level and now connect with CO_2 insufflations with pressure at 6 mm Hg. Now telescope is put in 10 mm port after white balancing is given.
2. Now another 10 mm incision at ipsilateral areolar margin for another port. After the incision, create subcutaneous plane toward neck and then pass the 10 mm cannula bluntly in subcutaneous plane toward the ipsilateral neck side and reach up to the first 12 mm blind tunnel and view with the telescope.
3. Now another 5 mm skin crease incision above the first port in AAL and create a small subcutaneous space with blunt artery forceps and pass a 5 mm trocar bluntly in subcutaneous plan directing it toward the ipsilateral neck side into the 10 mm tunnel.

Subplatysmal Space Creation

Once all the three ports have been created, a subcutaneous tunnel is made in the subplatysmal plane in the neck. The space is created laterally beyond the lateral border of SCM, superiorly up to the level of hyoid bone and medially up to the mid line and inferiorly beyond the suprasternal notch. This dissection is very crucial and careful use of electro-cautery is required because sometime the anterior jugular vein or lateral jugular vein is injured and causing lot of bleeding, so one can lose the plane of dissection and may get into the trouble.

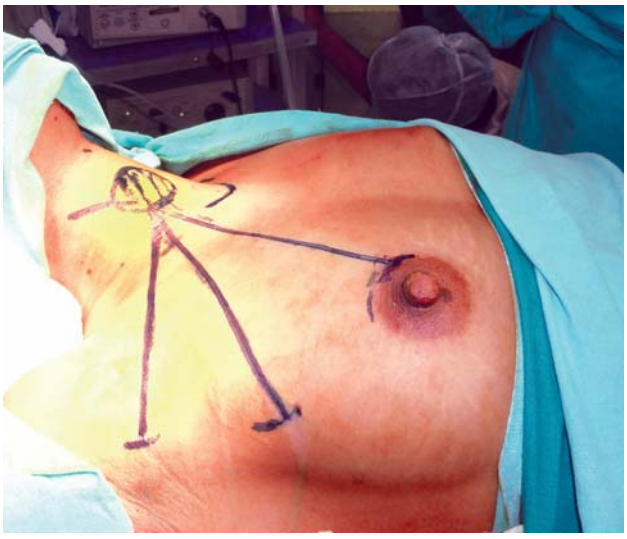

Fig. 1: Skin marking for the port placement

Dissection of Strap Muscles

After the creation strap of adequate space for working the camera is handled by camera assistant (CA). The SCM is held with the grasper and space is created between the SCM and strep muscle. This space creation is started at the junction of upper 2/3rd and lower 1/3rd of SCM and proceeds upward with the help of electrocautery hook; once upper and lower ends are dissected then depth up to the visceral surface of thyroid lobe is dissected. Now the strap muscle is carefully dissected from the thyroid lobe with the help of grasper and electrocautery hook.

Dissection of Inferior Pole and Isthmus

After mobilizing the strap muscle from the visceral surface of thyroid, middle thyroid vein is searched for and if it is present, coagulated and cut with ultrasonic devices. Then dissection is continued close to the thyroid gland inferiorly to handle the inferior vascular pedicle with ultrasonic vessel sealing and cutting devices. After cutting the inferior pedicle vessels, move toward the isthmus and cut the isthmus.

Lateral Dissection

The thyroid is now lifted up and medially to visualize the recurrent laryngeal nerve (RLN), RLN is identified and protected. The inferior parathyroid is identified inferiomedial to RLN identified and preserved. The inferior thyroid artery is secured properly with ultrasonic vessel sealing device. During this dissection care to be taken, not to injure the RLN and parathyroid specially when tubercle of zuckerkandl is enlarged. The endoscopic magnification makes this step easier.

Upper Pole Dissection

Now the lobe is dissected out from the trachea and the gland is now pulled down to dissect the superior pole. The superior pole vessels are either clipped or directly coagulated and cut with the ultrasonic vessel sealing device near the upper pole of the thyroid lobe to preserve the external branch of superior laryngeal nerve.

Dissection Near Trachea

After managing the large vessels, the small vessels are also managed with ultrasonic device, now the upper pole of lobe is retracted downward and medially identify the superior parathyroid gland.

The superior parathyroid is identify and preserve, then cut the berry's ligament near the trachea and also few small attachment to the trachea is managed with the ultrasonic vessel sealing.

If the nodule in the upper pole of lobe, it is some time difficult to manage and you need to cut few fibers of strap muscle to reach the upper vascular practice.

In hemithyroidectomy, there is no need to suture the cut end of isthmus when you cut with ultrasound vessel sealing device.

For total thyroidectomy the similar procedure is repeated on contralateral sides with similar manner and position. The operating surgeon have to perform surgery from opposite side.

Specimen Retrieval and Closure

Both dissected lobe is kept in endo bag and taken out from one axillary port. Sometimes when the specimen is large, then the tunnel of axillary port is dilated with large artery forceps.

Proper homeostasis is secured and one can put hemostatic gel foam or absorbable gauge on both sides of trachea. Now negative pressure tube drain is kept through the axillary port. All ports side is closed with the subcuticular suture (Fig. 2).

Postoperative Care

Postoperative care is same as conventional open thyroid surgery. Drain is removed after 48 to 72 hours. For hemi thyroidectomy most of our patients are discharged within 24 hours and for total thyroidectomy they are discharged after drain output is low and no sign of hypocalcemia. For women, we recommend them to wear a sports brassiere during the first month postoperative to protect the incision and to make free form discomfort (Fig. 3).

DISCUSSION

The overall outcome with this technique is comparable with the other endoscopic thyroid surgery. The postoperative pain after 1 to 3 days of surgery is less and mean drainage period is put 3 to 4 days after surgery and seroma may be present in few cases.[7]

Other approaches include bilateral areolar approach (BAA). Hur SM et al have operated 88 patients with benign tumors of any size or papillary thyroid microcarcinomas, the mean operation times were [121.7 ± 24.5 *vs* 102.6 ± 25 minutes for lobectomy ($p < 0.05$) and 162.5 ± 36.1 *vs* 131 ± 28 minutes for total thyroidectomy ($p < 0.05$) respectively]. There were no significant differences in the duration of hospitalization, amount of drainage from the surgical sites, and occurrence of postoperative complications.[8]

Another endoscopic thyroidectomy via bilateral axillo-breast approach (BABA), Choi JY et al presented 512 patients with thyroid diseases, who underwent BABA endoscopic thyroidectomy. A total of 397 had a malignant tumor and 115 had benign thyroid disease. Mean operation time was 151.2 ± 38.1 minutes for total and near-total thyroidectomy, and 141.7 ± 50.1 minutes for subtotal thyroidectomy and lobectomy. Regarding postoperative complications, transient hypocalcemia occurred in 31.1% of patients and permanent hypoparathyroidism occurred in 4.2% of patients. Transient hoarseness occurred in 20.3% of patients, and permanent vocal cord palsy occurred in 1.7%. Mean hospital stay after operation was 3.34 ± 0.8 days

Fig. 2: After closure of wound

Fig. 3: Four weeks after surgery

(range 3-7 days), and mean follow-up period was 57.1 ± 17.6 months (range 38.5-71.7 months). They concluded that endoscopic thyroidectomy via bilateral axillo-breast approach is a safe and effective method that gives good surgical completeness, a low rate of postoperative complications and recurrence, and an excellent cosmetic result.[9]

In summary these endoscopic techniques are becoming popular in Asia and well accepted with good cosmetic outcome and comparable complications.

REFERENCES

1. Huscher CS, Chiodini S, Napolitan C, et al. Endoscopic right thyroid lobectomy. Surg Endosc 1997;11:877.
2. Miccoli P, Rago R, Massi M, et al. Standerd versus video-assisted thyroidectomy: a prospective randomized study. Surgery 130;1039-1043.
3. Gal I, Solymosi T, Szabo, et al. Minimally invasive video assisted thyroidectomy and conventional thyroidectomy: a prospective randomized study. Surg Endosc 2008;22:2245-2449.
4. Miccoli P, Berti P, Frustaci GL, et al. Video-assisted thyroidectomy: indications and results. Langenbeck Arch Surg 2006;391:68-71.
5. Gagner M. Endoscopic subtotal parathyroidectomy in patients with primary hyperparathyroidism. Br J Surg 1996;83:875.
6. Ohgami M, Ishii A, Aisawa Y, et al. Scarless endoscopic thyroidectomy: breast approach for better cosmesis. Surg Laparosc Endosc Percutan Tech 10:1-4.
7. Lee MC, Mo JA, Choi IJ, Lee BC, Lee GH. New endoscopic thyroidectomy via a unilateral axillo-breast approach with gas insufflation: preliminary report. Head Neck 2013 Apr;35(4): 471-476.
8. Hur SM, Kim SH, Lee SK, Kim WW, Choe JH, Lee JE, Kim JH, Nam SJ, Yang JH, Kim JS. New endoscopic thyroidectomy with the bilateral areolar approach: a comparison with the bilateral axillo-breast approach. Surg Laparosc Endosc Percutan Tech. 2011 Oct;21(5):e219-224.
9. Choi JY, Lee KE, Chung KW, Kim SW, Choe JH, Koo do H, Kim SJ, Lee J, Chung YS, Oh SK, Youn YK. Endoscopic thyroidectomy via bilateral axillo-breast approach (BABA): review of 512 cases in a single institute. Surg Endosc 2012 Apr; 26(4):948-955.

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