

# Modified transoral endoscopic thyroid surgery for treatment of thyroid cancer: operative steps and video

Xiao-Wei Peng, Hui Li, Zan Li, Xiao Zhou, Da-Jiang Song, Bo Zhou, Chun-Liu Lv, Wen Peng

Department of Head and Neck Surgery, Hunan Cancer Hospital, The Affiliated Tumor Hospital of Xiangya Medical School, Central South University, Changsha 410008, China

Correspondence to: Zan Li, MD. The Department of Head and Neck Surgery, Hunan Cancer Hospital, The Affiliated Tumor Hospital of Xiangya Medical School, Central South University, Changsha 410008, China. Email: lizan@hnszlyy.com.

**Abstract:** In this video we describe a kind of modified transoral endoscopic thyroid surgery involving meticulous dissection of mental nerve. Inclusion criteria are: the diameter of benign tumors such as thyroid cyst, nodular goiter were limited less than 50 mm; the malignant thyroid tumors including follicular and papillary microcarcinoma were defined as a papillary carcinoma <2 cm in diameter and endoscopic surgery required for the patient. A 6 cm arc-shaped incision was designed at oral vestibule. The branches of mental nerves at both sides were identified and exposed carefully. A 10 mm trocar was placed at the midpoint of the vestibule. Two 5 mm trocars were separately inserted into the vestibule at lateral or medial of the medial branches of the mental nerve. Thyroidectomy and central lymph node dissection was done fully endoscopically using conventional endoscopic instruments.

**Keywords:** Oral vestibule; mental nerve; endoscopic; thyroidectomy; thyroid cancer

Submitted May 13, 2017. Accepted for publication Jul 17, 2017.

doi: 10.21037/gs.2017.07.11

View this article at: <http://dx.doi.org/10.21037/gs.2017.07.11>

## Description of the surgical technique

Transoral endoscopic thyroidectomy is developing very rapidly, which allows operations without skin incisions. However, it still face the problem of space limitation and limited angle while deal with the upper pole of thyroid and the possibility of mental nerve injury. We present a case report video of a modified transoral endoscopic thyroidectomy involving dissection of mental nerve (*Figure 1*).

## Patient selection

We followed precise inclusion criteria, i.e., the diameter of benign tumors such as thyroid cyst, nodular goiter were limited less than 50 mm; the malignant thyroid tumors including follicular and papillary microcarcinoma were defined as a papillary carcinoma <2 cm in diameter; endoscopic surgery required for the patient.

Exclusion criteria included, i.e., previous radiation in the area of the head, neck and/or upper mediastinum;

had previous neck surgery; recurrent goiter; evidence of the cervical neck lymph node metastasis; Hashimoto's thyroiditis; malignant tumors were close to trachea or tracheoesophageal groove (2-7).

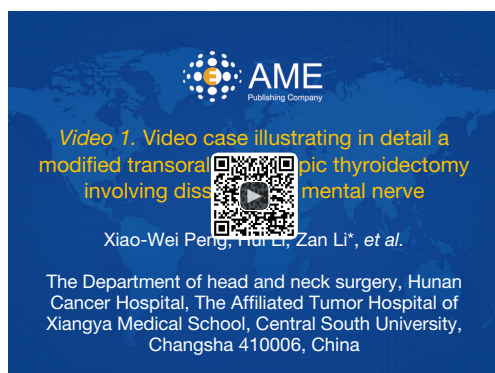
## Operative technique

The anesthesia of patients underwent the general endotracheal anesthesia through nasal intubation.

The patients were in a supine position with neck extension created by a pillow placed under the shoulders to make the angle about 140 between hyoid-chin line and hyoid-suprasternal fossa line.

An L-shaped pole to lift up the retracting wires was fixed above the patient's neck. After conventional disinfection, the primary surgeon sat down at a position near the patient's head and the assistants sat on the left and right side of the patient separately. In addition, a nurse sat down near the primary surgeon.

Oral disinfection was performed three times with



**Figure 1** Video case illustrating in detail a modified transoral endoscopic thyroidectomy involving dissection of mental nerve. A 10 mm trocar was placed into the previously created subcutaneous tunnel through the midpoint of the vestibule. Two 5 mm trocars were separately inserted into the vestibule at lateral or medial of the medial branches of the mental nerve. Thyroidectomy and central lymph node dissection were done fully endoscopically using conventional endoscopic instruments (1).

Available online: <http://www.asvide.com/articles/1886>

chlorhexidine. The lower lip was then retracted, exposing the oral vestibule.

A 6 cm arc-shaped incision beginning at the midpoint of the vestibule 1 cm inferior to the gingival edge and ended at the mucosa opposite to the bilateral second premolar was made with electrotome. The branches of mental nerves at both sides were identified and exposed.

About 10 mL expansion solution (1 mg adrenaline in 500 mL saline) was injected down the middle of the incision towards the submental triangle. From the chin to the suprasternal fossa, a subcutaneous tunnel was created by a blunt rod. A 10 mm trocar was placed into the previously created subcutaneous tunnel through the midpoint of the vestibule, and a 1.0 cm endoscope was inserted into the trocar for observation. CO<sub>2</sub> was injected and a constant pressure of 6 mmHg was maintained. Then, two 5 mm trocars were separately inserted into the vestibule at lateral or medial of the medial branches of the mental nerve, serving as the main and auxiliary operation holes.

Next, the dissection can be performed up to the medial border of the sternocleidomastoid muscle on both sides. Superior border is the larynx, inferior border is the suprasternal notch, and lateral borders were the anterior and medial borders of both sternocleidomastoid muscles. Laterally, both for lobectomy and bilateral procedure, the dissection is continued up to the medial border of

the sternocleidomastoid muscle on both sides. After dissection of the subplatysmal plane, four prolene sutures were stitched to the subplatysmal layer of the anterior cervical area. The prolene sutures were lifted up by the retracting wire system fixed to the L-shaped pole above the patient's neck.

## Thyroidectomy

After establishment of the working space, an incision was made at the linea alba cervicalis with the Harmonic scalpel and dissection was made at the strap muscles, which was then pulled laterally with a retractor for exposure of the thyroid gland. The pyramidal lobe was divided and the isthmus is transected with a Harmonic scalpel after dissection of the thyroid gland from the trachea. Part of sternothyroid muscle was transected, upper pole of thyroid was exposed, and then the superior thyroid artery and vein are severed. The upper pole can be dislocated completely. The medial thyroid vein was also severed by the Harmonic scalpel. The upper pole of the gland was lifted up and the parathyroid and the recurrent laryngeal nerve (RLN) were carefully identified and further separated. Berry's ligament was cut, and thereafter the thyroid gland including nodule is removed. Under direct visualization, the resected tissue was removed by a specimen bag made from the observation hole and sent for intraoperative frozen pathology (8).

## Central lymph node dissection

If PTC was detected, the central lymph node clearance was carried out on the same side immediately. The strap muscles were stretched to the outside as much as possible by the thyroid retractor to fully expose the operative field. The RLN and parathyroid glands were identified and preserved (9). Lymph nodes and adipose tissue were resected by an ultrasonic scalpel (5,10).

Closure. The operation site was flushed with sterile water and then checked for bleedings. The strap muscles were running sutured with 3-0 absorbable sutures. A slender drainage tube made by a 6# tube specialized for drainage of pancreatic fluid is placed in the bed of the thyroid gland through the retractor hole to drain blood and fluid, followed by excluding gas and 5-0 absorbable sutures for the oral mucosa incisions. After that, the mouth was rinsed with chlorhexidine (6).

Postoperative management. During the first postoperative 24 hours, cotton pads were used to press

against the skin over the chin, and ice compression was also applied on the skin over the neck and chin to relieve swelling and bleeding. The patient began oral intake of liquid diet 6 hours after surgery, and the drainage tube was removed 2 or 3 days after operation. Perioperative use of antibiotics including cefathiamidine and ornidazole lasted for 3 days generally to avoid infection. Vocal cord function was checked by laryngoscopy the day after surgery. Discharges from hospital are dictated by the common rules of the thyroid surgery.

### Acknowledgements

*Funding:* This study was supported by the grants from Science and Technology Foundation of Hunan province in China (2013TP4087) and Natural Science Foundation of Hunan Province (2016JJ6089).

### Footnote

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

*Informed Consent:* Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

### References

1. Peng XW, Li H, Li Z, et al. Video case illustrating in detail a modified transoral endoscopic thyroidectomy involving dissection of mental nerve. *Asvide* 2017;4:567. Available online: <http://www.asvide.com/articles/1886>
2. Yang J, Wang C, Li J, et al. Complete Endoscopic Thyroidectomy via Oral Vestibular Approach Versus Areola Approach for Treatment of Thyroid Diseases. *J Laparoendosc Adv Surg Tech A* 2015;25:470-6.
3. Anuwong A. Transoral Endoscopic Thyroidectomy Vestibular Approach: A Series of the First 60 Human Cases. *World J Surg* 2016;40:491-7.
4. Wilhelm T, Metzger A. Video. Endoscopic minimally invasive thyroidectomy: first clinical experience. *Surg Endosc* 2010;24:1757-8.
5. Wang C, Zhai H, Liu W, et al. Thyroidectomy: a novel endoscopic oral vestibular approach. *Surgery* 2014;155:33-8.
6. Dionigi G, Bacuzzi A, Lavazza M, et al. Transoral endoscopic thyroidectomy via vestibular approach: operative steps and video. *Gland Surg* 2016;5:625-627.
7. Yang K, Ding B, Lin C, et al. The novel transvestibule approach for endoscopic thyroidectomy: a case series. *Surg Laparosc Endosc Percutan Tech* 2016;26:e25-8.
8. Witzel K, Hellinger A, Kaminski C, et al. Endoscopic thyroidectomy: the transoral approach. *Gland Surg* 2016;5:336-41.
9. Park JO, Kim MR, Kim DH, et al. Transoral endoscopic thyroidectomy via the trivestibular route. *Ann Surg Treat Res* 2016;91:269-72.
10. Wang Y, Yu X, Wang P, et al. Implementation of intraoperative neuromonitoring for transoral endoscopic thyroid surgery: a preliminary report. *J Laparoendosc Adv Surg Tech A* 2016;26:965-71.

**Cite this article as:** Peng XW, Li H, Li Z, Zhou X, Song DJ, Zhou B, Lv CL, Peng W. Modified transoral endoscopic thyroid surgery for treatment of thyroid cancer: operative steps and video. *Gland Surg* 2017;6(6):742-744. doi: 10.21037/gs.2017.07.11