

Thyroidectomy: A novel endoscopic oral vestibular approach

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Background. To date, no report has discussed endoscopic thyroidectomy using the oral vestibular approach (ETOVA). The objective of this study was to evaluate the feasibility, safety, efficacy, and cosmetic results of endoscopic thyroidectomy involving this surgical approach.

Methods. Twenty-four patients with benign thyroid nodules were randomized into the ETOVA (n = 12) and the endoscopic thyroidectomy by areola approach (ETAA) groups (n = 12). Therapeutic effects were assessed at follow-up by physical examination. All patients were followed to evaluate thyroid function and scar formation from endoscopic treatment.

Results. Complete resection of all the lesions was performed endoscopically, and no conversion to open surgery was needed. There was no difference between the 2 groups with respect to surgical time (60.4 vs 59.6 min), blood loss (10.8 vs 13.8 mL), postoperative hospital stay (4.9 vs 4.6 d), or cost of surgery (17.6 vs 17.4 thousand yuan). Patients who underwent the areola approach had 3 scars, 10 × 2 mm, 5 × 1 mm, and 5 × 1 mm in size, all of which were visible at the 6-month follow-up. Patients in the ETOVA group did not have any scars. Follow-up showed a significant difference (P = .019) in the satisfaction score between the ETOVA (2.33 ± 0.65) and the ETAA group (1.58 ± 0.79). Imaging showed that all patients had complete resection and no residual disease. Severe complications such as subcutaneous accumulation of blood and fluid, superior or recurrent laryngeal nerve injury, and parathyroid dysfunction were not observed.

Conclusion. ETOVA was found to be safe and feasible and did not leave any scars; however, large-scale, randomized clinical trials are necessary for confirmation. (Surgery 2014;155:33-8.)

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CONVENTIONAL OPEN THYROIDECTOMY leaves scars over parts of the neck. This can place a great psychological burden on the patient. With economic development and improvements in lifestyle, patients' demand for minimally invasive and esthetically pleasing surgery has increased greatly. Endoscopic treatment technology has obvious cosmetic advantages over conventional open operative treatments. Endoscopic surgery not only requires smaller surgical incisions, but also facilitates faster recovery and results in less postoperative scarring. Endoscopic surgical methods allow more hidden parts

of the body to be entered to reach the focus of the thyroid through the subcutaneous tissue, which leads to better cosmetic results.¹

There are many approaches for performing endoscopic thyroidectomies. These include thyroidectomy through the neck,^{2,3} minimally invasive video-assisted thyroidectomy,⁴ subclavian approach,^{5,6} axillary approach,⁷⁻⁹ axillary areola approach,¹⁰⁻¹² chest and breasts approach,¹²⁻¹⁴ complete areola approach,^{15,16} dorsal approach,¹⁷ and submandibular approach.¹⁸ These approaches allow the neck incision to be shorter or grossly invisible; however, endoscopic thyroid surgery still results in considerable surgical scarring on the skin surface. Comparing the current approaches of mature thyroidectomy, the complete areola approach has the best cosmetic result.¹⁹⁻²¹ As lifestyles have improved, so have cosmetic requirements for thyroidectomies, particularly among female patients who desire hidden or no scars. Endoscopic thyroid surgery through the oral cavity has been reported.²²⁻²⁶ However, the channel for observation is only 5 mm. Although the surgery is scarless, the removal of the specimen is difficult.

Supported by the Science and Technology Development Fund of Macao (No. 027/2010/A).

Accepted for publication June 20, 2013.

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0039-6060/\$ - see front matter

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<http://dx.doi.org/10.1016/j.surg.2013.06.010>

Postoperative swelling on the floor of the mouth is severe, and there is a high conversion rate to open surgery. Benhidjeb et al²⁷ reported many difficulties with this surgical method.

The present study was performed on patients admitted to our hospital from November 2011 to June 2012 with a goiter. A prospective, randomized, comparative study was performed between patients undergoing the oral vestibular approach (ETOVA) for endoscopic thyroid resection and those undergoing the complete areola approach for endoscopic thyroidectomy to evaluate the feasibility, safety, efficacy, and cosmetic results of endoscopic thyroid resection.

MATERIALS AND METHODS

Patients. From November 2011 to June 2012, 24 consecutive patients were enrolled in a prospective, controlled clinical protocol approved by the ethical committee of the First Affiliated Hospital of Jinan University. All patients provided written informed consent before beginning the study and were randomly assigned to the treatment groups. Patients were informed of the potential risks and benefits of endoscopic thyroidectomy, and written consent was obtained. Twenty-four patients with a goiter underwent preoperative physical examinations, B-ultrasonography, and noncontrast computed tomography to determine the disease focus, diabetes status, and malignancy status. Biopsies were performed and the tissues were sent for cytopathology (Table I).

Study eligibility criteria were as follows: (a) B-ultrasonography and computed tomography suggesting a benign tumor, which was confirmed by cytopathology as nonmalignant. (b) Patient agreement to minimally invasive endoscopic thyroid resection. (c) Mass with a diameter not exceeding 6 cm with no skin damage over the neck or breast area. (d) Generally good patient health with normal heart and lung functions, normal tolerance to anesthesia, and normal coagulation. Study exclusion criteria were: (a) Maximum diameter of mass >6 cm with damage over the neck and breast area; (b) patient indifference regarding unscarred skin over the neck region; (c) advanced cardiac or pulmonary disease; and (d) patient not surgical candidate for minimally invasive endoscopic surgery.

Treatment modalities. *Endoscopic thyroidectomy with a complete oral vestibular approach.* The patient was placed in a supine position with the neck tilted and the head lifted. Nasotracheal intubation was performed under general anesthesia. After conventional disinfection, the surgeon stood over the patient's head. Oral disinfection was performed

twice with chlorhexidine. Then, the lower lip was retracted, exposing the buccal cavity. An expansion solution of 1 mg adrenaline in 500 mL saline was injected down the middle of the buccal cavity towards the neck. Subsequently, a 10-mm mucosal incision was made in the oral vestibule parallel to the incisors. Using a 10-mm trocar (puncture cannula), the incision was punctured for observation, CO₂ was injected and a constant pressure of 6 mmHg was maintained. Next, a 5-mm incision was made on both sides of the mucous membrane of the buccal cavity to allow placement of a 5-mm trocar into the main and auxiliary operation holes. A 10-mm endoscopic observation hole was placed (Fig, A–C). Under direct vision using ultrasonic scalpel separation of the jaw and neck, loose subcutaneous connective tissue of the suprasternal fossa was removed. Both sides reached the sternocleidomastoid, and the subcutaneous gap was expanded. An ultrasonic scalpel was used for dissection of the anterior neck muscles. The infrahyoid muscle layer and thyroid gland were revealed using an in vitro suspension line retractor. The tumor was identified, and the thyroid isthmus was removed. Then, the superior blood supply to the thyroid was severed, and the thyroid suspensory ligament and finally the inferior blood supply were severed. Depending on the disease condition, resection of the entire side of the thyroid gland was performed, in some cases retaining only the recurrent laryngeal nerve and a small amount of gland. During the separation process, the head of the ultrasonic scalpel was maintained away from the trachea, other glands, and nerves. This protected the parathyroid, recurrent laryngeal nerve, and trachea. Under direct visualization, the resected tissue was removed from the observation hole and sent for pathologic examination. The surgical wound was flushed with normal saline. The oral vestibular wound was sutured close and a slight pressure bandage was applied to the surgical site for 2 days.

Endoscopic thyroidectomy with a complete areolar approach. After successful intubation after induction of general anesthesia, the patient's neck and shoulders were slightly raised. The patient was prepped and draped in the usual sterile fashion and the primary surgeon was positioned between the patient's legs and his assistants were on either side of the patient. A curved, 10-mm incision was made at the 2 o'clock position of the areola on the right breast. An expansion solution of 1 mg adrenaline in 500 mL saline was injected subcutaneously into the neck and chest regions. The neck and chest regions were repeatedly subcutaneously punctured with a blunt rod. Then, a 10-mm trocar

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