

1. Head Neck. 2017 Dec 14. doi: 10.1002/hed.25034. [Epub ahead of print]

Comparative analysis of 2 robotic thyroidectomy procedures: Transoral versus bilateral axillo-breast approach.

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Abstract

BACKGROUND:

The surgical outcomes of a single surgeon's initial cases of transoral robotic thyroidectomy (TORT) were compared with the surgeon's initial cases of a bilateral axillo-breast approach (BABA) robotic thyroidectomy.

METHODS:

The medical reports were retrospectively reviewed. The BABA robotic thyroidectomies were performed between 2008 and 2009, and TORTs were performed between 2012 and 2016.

RESULTS:

Each group comprised 50 patients. Operative time for total thyroidectomy was shorter, the pain scores were lower, and hospital stays were shorter in the TORT group than in the BABA robotic thyroidectomy group. There were no significant differences between groups in either vocal cord palsy or hypoparathyroidism rates. There were 9 cases of mental nerve injury in the first 12 cases of TORT, but none subsequently.

CONCLUSION:

The TORT procedure could be performed safely and showed comparable outcomes with BABA robotic thyroidectomy in selected patients. Therefore, TORT may be an alternative approach for patients who prefer a scar-free thyroidectomy.

2. Endocrine. 2018 Feb;59(2):275-279. doi: 10.1007/s12020-017-1451-x. Epub 2017 Oct 16.

Transoral endoscopic thyroidectomy via a vestibular approach: why and how?

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Abstract

The transoral endoscopic thyroidectomy vestibular approach (TOETVA) is a novel, scar-free surgical procedure that does not require visible incisions. Indications for TOETVA are as follows: predicted gland width on diagnostic

imaging ≤ 10 cm; a thyroid volume outline of < 45 mL or dominant nodule dimension of ≤ 50 mm; three or four Bethesda lesions; a primary papillary microcarcinoma without local or distant metastasis; and patient request for optimal esthetic results. Contraindications are as follows: patients unfit for general anesthesia; precedent radiation in the head, neck, upper mediastinum; antecedent neck surgery; recurrent goiter; a gland volume of > 45 mL or main nodule diameter of > 50 mm; and documentation of lymph node or distant metastases, tracheal/esophageal infiltration, preoperative laryngeal nerve palsy, hyperthyroidism, mediastinal goiter, or an oral abscess. Patients with poorly differentiated or un-differentiated cancer, dorsal extrathyroidal radius, and/or lateral neck metastasis are not suitable for TOETVA. Following the introduction of a robotic surgical system, enabling a three-dimensional surgical view and the use of articulating instruments, TOETVA became suitable for most differentiated thyroid cancers without evidence of extensive extrathyroidal invasion or lateral neck metastasis. The procedure is performed using a vestibular approach and three-port technique; a 10-mm port is used for the 30° endoscope, two 5-mm ports are used for the dissecting and coagulating instruments, and an 8-mm port is placed in the axillary fold during the robotic procedure to enhance fine countertraction of tissue for radical oncological dissection. TOETVA follows surgical planes and is probably the best scar-free approach to the thyroid, given the short distance between the gland and intraoral incisions.

3. World J Surg. 2017 Jan;41(1):116-121. doi: 10.1007/s00268-016-3738-0.

Remote Access Robotic Facelift Thyroidectomy: A Multi-institutional Experience.

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Abstract

BACKGROUND:

Robotic facelift thyroidectomy (RFT) was developed as a new surgical approach to the thyroid gland using a remote incision site. Early favorable results led to this confirmatory multi-institutional experience.

METHODS:

Prospectively collected data on consecutive patients undergoing RFT in five North American academic endocrine surgical practices were compiled. Surgical indications, operative times, final pathology, nodule size, complications, and postoperative management (drain use and length of hospital stay) were evaluated.

RESULTS:

A total of 102 RFT procedures were undertaken in 90 patients. All but one of the patients (98.9 %) were female, and the mean age was 41.9 ± 13.1 years (range 12-69 years). The indication for surgery was nodular disease in 91.2 % of cases;

8.8 % were completion procedures performed for a diagnosis of cancer. The mean size of the largest nodule was 1.9 cm (range 0-5.6 cm). The mean total operative time for a thyroid lobectomy was 162 min (range 82-265 min). No permanent complications occurred. There were 4 cases (3.9 %) of transient recurrent laryngeal nerve weakness, no cases of hypocalcemia, and 3 (2.9 %) hematomas. There were no conversions to an anterior cervical approach. The majority of patients were managed on an outpatient basis (61.8 %) and without a drain (65.7 %).

CONCLUSIONS:

RFT is technically feasible and safe in selected patients. RFT can continue to be offered to carefully selected patients as a way to avoid a visible cervical scar. Future prospective studies to compare this novel approach to other remote access approaches are warranted.

4. J Endocrinol Invest. 2017 Nov;40(11):1259-1263. doi: 10.1007/s40618-017-0676-0. Epub 2017 Apr 21.

Transoral thyroidectomy: advantages and limitations.

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Abstract

In this opinion paper of the Journal of Endocrinological Investigation, leading experts in the field report on their current clinical experience with a novel approach for thyroid gland surgery, namely, "transoral thyroidectomy" (TOT). This feasible and novel surgical procedure does not require visible incisions and is, therefore, a truly scarless surgery. Patients meeting the following criteria can be considered as candidates for TOT: (a) an ultrasonographically (US) estimated thyroid diameter ≤ 10 cm; (b) US-estimated gland volume ≤ 45 mL; (c) nodule size ≤ 50 mm; (d) presence of a benign tumor such as a thyroid cyst or a single- or multi-nodular goiter; (e) Bethesda 3 and/or 4 category and (f) papillary microcarcinoma without the evidence of metastasis. The procedure is conducted via a three-port technique at the oral vestibule using a 10-mm port for the 30° endoscope and two additional 5-mm ports for the dissecting and coagulating instruments. TOT is performed using conventional endoscopic instruments and is probably the best scarless approach to the thyroid because of the short distance between the thyroid and the incisions placed intra-orally that do not result in any cutaneous scar and upon following the surgical planes. Experts in TOT organized a working group of general, endocrine, head and neck ENT surgeons and endocrinologist to develop the standards for practicing this emerging technique.

5. Surg Endosc. 2018 Jan;32(1):456-465. doi: 10.1007/s00464-017-5705-8. Epub 2017 Jul 17.

Transoral endoscopic thyroidectomy vestibular approach (TOETVA): indications, techniques and results.

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Abstract

INTRODUCTION:

The Transoral Neck Surgery (TONS) Study Group was established at the 1st International Thyroid NOTES Conference in February 2016 with the intention of standardizing and refining thyroid NOTES techniques, including both transoral endoscopic and robotic thyroidectomy approaches. Herein, the authors report the modification of indications, preparation, and step-by-step explanations for operative techniques, as well as results and postoperative care for transoral endoscopic thyroidectomy vestibular approach (TOETVA).

METHODS:

Between February 2015 and December 2015, a total of 200 patients comprising 8 males (4%) and 192 females (96%) underwent TOETVA using 3 laparoscopic ports inserted at the oral vestibule. Of these patients, 111 presented with single thyroid nodules (55.5%), while 66 patients had multinodular goiters (33%), 12 had Graves' disease (6%) and 11 had papillary microcarcinoma (5.5%). The CO₂ insufflation pressure was maintained at 6 mmHg. Each surgery was performed using laparoscopic instruments and ultrasonic devices.

RESULTS:

TOETVA was performed on 200 consecutive patients. No conversion to conventional open surgery was necessary. Average tumor size was 4.1 ± 1.78 cm (1-10 cm). Median operative time was 97 ± 40.5 min (45-300 min). Median blood loss was 30 ± 46.25 mL (6-300 mL). Mean visual analog scale measurements were 2.41 ± 2.04 (2-7), 1.17 ± 1.4 (0-5), and 0.47 ± 0.83 (0-3) on the first, second, and third days, respectively. Temporary hoarseness and hypoparathyroidism occurred in 8 patients (4%) and 35 patients (17.5%), respectively. No permanent hoarseness or hypoparathyroidism occurred. Mental nerve injury occurred in 3 patients (1.5%). One patient (0.5%) developed a post-operative hematoma that required open surgery. No infection was identified.

CONCLUSION:

TOETVA was shown to be safe and feasible with a reasonable surgical duration and minimal pain scores. This approach shows promise for those patients who are motivated to avoid a neck scar.

Yonsei Experience of 5000 Gasless Transaxillary Robotic Thyroidectomies.

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Abstract

BACKGROUND:

Since the use of robot systems in thyroid surgery was introduced in 2007, we have advanced a novel method of robotic thyroidectomy (RT) using a gasless transaxillary approach (TAA). We report our experience with this technique and detail the surgical outcome of 5000 robotic thyroidectomies.

METHODS:

From October 2007 to May 2016, we successfully performed 5000 robotic thyroidectomies using a gasless TAA at the Department of Surgery, Yonsei University Health System. The medical records of the patients are reviewed retrospectively, and the details of clinicopathologic characteristics, operation times, perioperative complications, and oncologic outcomes are analyzed.

RESULTS:

The 5000 patients with thyroid tumor (4804 with cancer and 196 with benign tumor) underwent RT using a gasless TAA. Mean operation time was 134.5 ± 122.0 min. The most common histologic subtype of thyroid cancer was papillary (98%), and the mean tumor size was 8.0 ± 6.0 mm. Stage I was found in 85.4% patients regarding tumor nodes metastasis staging. The 196 benign tumors consisted of 104 adenomatous hyperplasias (53.0%), 43 follicular adenomas (21.9%), 30 Graves' diseases (15.3%), and 19 others (9.7%). Postoperative complication occurred in 24.1% without any serious one, and overall morbidity tended to decrease over time. No disease-specific mortality was observed during the follow-up period. Locoregional recurrence was developed in 26 patients (0.5%).

CONCLUSION:

The authors have tried to improve RT technique using gasless TAA and achieved acceptable surgical outcomes. The rapid evolution of surgical robot technology and our constant effort to advance RT technique using gasless TAA would make it possible to reduce the perioperative morbidity and gain the best possible operative and oncologic outcomes.

7. Gland Surg. 2017 Jun;6(3):218-228. doi: 10.21037/g.s.2017.03.18.

Overview of robotic thyroidectomy.

[Chang EHE](#)¹, [Kim HY](#)², [Koh YW](#)³, [Chung WY](#)⁴.

Abstract

With the advancement and adaptation of technology, there has been a tremendous evolution in the surgical approaches for thyroidectomy. Robotic thyroidectomy has become increasingly popular worldwide attracting both surgeons and patients searching for new and innovative techniques for thyroidectomy with a superior cosmetic result when compared to the conventional open procedures. In this review, we describe the following surgical approaches for robotic thyroidectomy: transaxillary, retroauricular (facelift) and transoral. The advantages and disadvantages as well as limitations of each approach are examined, and future directions of robotic thyroidectomy are discussed.

8. Gland Surg. 2017 Jun;6(3):250-257. doi: 10.21037/gs.2017.04.05.

Bilateral axillo-breast approach robotic thyroidectomy: review of evidences.

[Liu SY](#)¹, [Kim JS](#)².

Abstract

The bilateral axillo-breast approach (BABA) is one of the most popular contemporary remote-access thyroidectomy techniques. While the initial experiences with BABA endoscopic thyroidectomy (ET) were associated with some technical challenges and safety concerns, many limitations of the technique could now be substantially overcome by BABA robotic thyroidectomy (RT). In this review, the current literature evidences of BABA RT were analyzed. Data regarding the patient selection, the learning curve, and the comparison with open thyroidectomy (OT) and BABA ET were examined. Careful case selection for BABA RT should be undertaken according to factors related to the patient and the thyroid pathology. The learning curve of BABA RT was about 40 cases. Comparing to OT, BABA RT was comparable to OT for the complication profiles and most perioperative outcomes. But it was associated with longer operative time, higher cost and possibly inferior oncological control with lower number of central lymph node (LN) retrieved. When compared to BABA ET, BABA RT was comparable for most perioperative outcomes except longer operative time and higher cost. Yet, BABA RT was superior to BABA ET for better oncological control. BABA RT is a safe and effective procedure for most benign thyroid conditions and low-risk differentiated thyroid cancers (DTC).

9. Gland Surg. 2017 Dec;6(Suppl 1):S49-S58. doi: 10.21037/gs.2017.10.02.

Less than total thyroidectomy for goiter: when and how?

[Makay Ö](#)¹.

Abstract

Benign goiter is the most common endocrine disease that requires surgery, especially in endemic areas suffering from iodine-deficiency. Recent European and American guidelines recommended total thyroidectomy for the surgical treatment of multinodular goiter. Total thyroidectomy has now become the technique of choice and is widely considered the most reliable approach in preventing recurrence. Nevertheless, total thyroidectomy carries a substantial risk in terms of hypoparathyroidism and the morbidity associated with injury to the inferior laryngeal nerve. In this context, partial/less-than-total thyroidectomy is being considered once again as a viable alternative. This review will discuss the extent of thyroid surgery for benign disease and the impact of the surgical protocol on the patient- and surgeon-specific risk factors for specific complication rates.

10. Surg Endosc. 2017 Dec;31(12):5451-5456. doi: 10.1007/s00464-017-5603-0. Epub 2017 May 31.

A novel surgery technique: non-visual dissection for establishing the operating space during total endoscopic thyroidectomy.

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Abstract

BACKGROUND:

Patients and surgeons are typically satisfied with the cosmetic results of total endoscopic thyroidectomy using the complete areola approach. However, the disadvantages of this approach include an excessive free flap and a longer operative time.

METHODS:

A retrospective analysis was conducted in 72 patients (64 women and 8 men) with a benign thyroid nodule who underwent non-unvisual dissection to establish the operating space for endoscopic surgery.

RESULTS:

The time needed to create the operating space in the chest was 6.43 ± 0.94 min. The time for the overall operating space was 15.35 ± 1.52 min. The overall surgical time was 96.54 ± 19.32 min. The flap area in the chest was 30.25 ± 3.42 cm².

CONCLUSIONS:

Application of non-visual dissection shorten the time to create operating space and the overall surgical time, and markedly reduced the flap area. Our non-visual dissection technique for establishing the operating space is different from any previous techniques.

11. Thyroid. 2016 Mar;26(3):331-7. doi: 10.1089/thy.2015.0407.

American Thyroid Association Statement on Remote-Access Thyroid Surgery.

[Berber E¹](#), [Bernet V²](#), [Fahey TJ 3rd³](#), [Kebebew E⁴](#), [Shaha A⁵](#), [Stack BC Jr⁶](#), [Stang M⁷](#), [Steward DL⁸](#), [Terris DJ⁹](#); [American Thyroid Association Surgical Affairs Committee](#).

Abstract

BACKGROUND:

Remote-access techniques have been described over the recent years as a method of removing the thyroid gland without an incision in the neck. However, there is confusion related to the number of techniques available and the ideal patient selection criteria for a given technique. The aims of this review were to develop a simple classification of these approaches, describe the optimal patient selection criteria, evaluate the outcomes objectively, and define the barriers to adoption.

METHODS:

A review of the literature was performed to identify the described techniques. A simple classification was developed. Technical details, outcomes, and the learning curve were described. Expert opinion consensus was formulated regarding recommendations for patient selection and performance of remote-access thyroid surgery.

RESULTS:

Remote-access thyroid procedures can be categorized into endoscopic or robotic breast, bilateral axillo-breast, axillary, and facelift approaches. The experience in the United States involves the latter two techniques. The limited data in the literature suggest long operative times, a steep learning curve, and higher costs with remote-access thyroid surgery compared with conventional thyroidectomy. Nevertheless, a consensus was reached that, in appropriate hands, it can be a viable option for patients with unilateral small nodules who wish to avoid a neck incision.

CONCLUSIONS:

Remote-access thyroidectomy has a role in a small group of patients who fit strict selection criteria. These approaches require an additional level of

expertise, and therefore should be done by surgeons performing a high volume of thyroid and robotic surgery.