

TRANSORAL ENDOSCOPIC THYROIDECTOMY: EARLY OUTCOMES AT MILITARY HOSPITAL 175

Nong Huu Tho^{1*}, Tran Hong Quang¹, Nguyen Viet Cuong¹, Dang Le Hong Ngan²

¹Department of Thoracic Surgery, Military Hospital 175 - Ho Chi Minh City, Vietnam

²Cardiothoracic Intensive Care Unit, Tam Anh General Hospital - Ho Chi Minh City, Vietnam

ABSTRACT

Background: Transoral endoscopic thyroidectomy vestibular approach (TOETVA) offers genuinely scarless access to the thyroid gland, yet institutional data from Vietnam remain sparse. We report the early outcomes at Military Hospital 175 following introduction of the technique in January 2024.

Methods: A prospective descriptive case series of 65 consecutive patients undergoing TOETVA at Military Hospital 175 between November 2025 and May 2026. Primary endpoints were operative time, estimated blood loss, length of hospital stay, early complication rates, postoperative pain assessed by visual analogue scale (VAS) on day 1, and cosmetic satisfaction (VAS at 1 month post-operatively).

Results: The cohort was predominantly female (86.2%; mean age 31 ± 9.7 years). Mean operative time was 90 min (range 70–120), mean blood loss 6.67 ± 2.3 mL, and mean hospital stay 7.1 ± 1.8 days. Transient complications included mental nerve paraesthesia (12.3%), temporary hoarseness (7.7%), delayed vocal recovery (3.1%), and cervical seroma (4.6%). One patient developed transient hypocalcaemia (1.5%). Two cases (3.1%) required conversion to open surgery, both due to uncontrolled intraoperative haemorrhage. No permanent complications were observed. Cosmetic satisfaction VAS at 1 month was 7.4 ± 0.9 , with 55.4% of patients reporting very high satisfaction (VAS ≥ 8).

Conclusion: TOETVA is safe and feasible during the early institutional implementation phase, with a complication profile comparable to published international series and high patient-reported cosmetic satisfaction. Expansion within the Vietnamese military and civilian healthcare system is warranted for appropriately selected patients.

Keywords: TOETVA; thyroid surgery; transoral endoscopic thyroidectomy; early outcomes; cosmetic satisfaction; Military Hospital 175.

1. INTRODUCTION

Thyroid nodular disease is one of the most prevalent endocrine conditions globally, with an estimated prevalence of 20–76% in the general population depending on the diagnostic method used. In Vietnam, a large population-based survey conducted in 2023 found a nodule prevalence of 48.4%, with women disproportionately affected (55.2% versus 42.9%; $p < 0.001$) [1]. Surgical resection remains the definitive treatment for thyroid nodules causing compressive symptoms, cosmetic concern, or progressive growth despite conservative management.

The principal limitation of conventional open thyroidectomy is the visible anterior cervical scar, which carries a measurable negative impact on cosmetic satisfaction, body image, and quality of life, particularly in young women who constitute the vast majority of patients presenting for thyroid surgery [2]. Various minimally invasive and remote-access techniques have been developed over the past two decades. Minimally invasive video-assisted thyroidectomy (MIVAT) reduced incision length while preserving direct cervical access [3]. Subsequent remote-access approaches—transaxillary, bilateral axillo-breast (BABA), and retroauricular—displaced scars to less conspicuous anatomical regions at the cost of more extensive flap dissection and longer operative times [4–6].

A paradigm shift occurred in 2016 when Anuwong first described TOETVA, a natural-orifice technique utilizing three incisions placed entirely within the oral vestibule [4]. The approach provides a truly scar-free neck, symmetrical midline access to both thyroid lobes, and direct visualization of bilateral recurrent laryngeal nerves. Since its introduction, TOETVA has been validated at multiple high-volume centres worldwide, demonstrating comparable perioperative safety to conventional surgery in carefully selected patients alongside superior cosmetic outcomes [4,5].

In Vietnam, the technique has gradually been adopted at several tertiary centres, with early

national series confirming feasibility and an acceptable safety profile [6]. Military Hospital 175 introduced TOETVA in January 2024 as part of its minimally invasive surgery programme. The present study reports early perioperative outcomes and cosmetic satisfaction data from the first 65 consecutive cases, providing evidence to guide further adoption within both the military and civilian healthcare systems of Vietnam.

2. METHODS

2.1. Study Design, Setting, and Population

This was a prospective descriptive case series conducted at the Military Hospital 175, Ho Chi Minh City, between November 2025 and May 2026. Sixty-five consecutive patients undergoing TOETVA were enrolled. The study was approved by the Institutional Ethics Committee of Military Hospital 175 (Approval No. 387/GCN-HĐĐĐ, dated 17 January 2026); written informed consent was obtained from all participants.

Eligible patients fulfilled all of the following inclusion criteria: (i) total thyroid gland diameter < 10 cm; (ii) thyroid gland volume < 45 mL; (iii) index nodule ≤ 4 cm; and (iv) written informed consent. Patients were excluded if they had uncontrolled hyperthyroidism, a history of prior neck irradiation, or active oral cavity infection.

2.2. Surgical Technique

All procedures followed the standardized Anuwong (2016) protocol. Under general endotracheal anaesthesia with the patient in supine

¹Department of Thoracic Surgery,
Military Hospital 175 - Ho Chi Minh City, Vietnam

²Cardiothoracic Intensive Care Unit,
Tam Anh General Hospital - Ho Chi Minh City, Vietnam

*Corresponding author: Nong Huu Tho
Email: huuthomd@gmail.com - Tel: 0977688868

Received: 15/06/2026 Revised: 03/07/2026

Accepted: 08/07/2026

DOI: 10.47972/vjcts.v56i.1797

neck-extension position, three trocars were placed through the oral vestibular mucosa: a 10 mm central port and two 5 mm lateral ports. Carbon dioxide insufflation was maintained throughout. A subplatysmal working space was created under direct endoscopic visualization from the oral vestibule to the sternal notch, with lateral borders at the sternocleidomastoid muscles. Haemostasis and tissue dissection were performed using an ultrasonic scalpel and LigaSure vessel-sealing device. The recurrent laryngeal nerve was identified and preserved under direct endoscopic visualization throughout the procedure.

2.3. Outcome Measures and Statistical Analysis

Pre-specified outcome variables were: (i) operative time; (ii) estimated intraoperative blood loss, measured by the volume of blood collected in the suction canister with irrigation fluid volume subtracted; (iii) length of postoperative hospital stay; (iv) postoperative pain on day 1 assessed by a 10-cm visual analogue scale (VAS; 0 = no pain, 10 = worst imaginable pain) (7); (v) early complications within 30 days; and (vi) cosmetic satisfaction assessed by a 10-cm VAS (0 = completely dissatisfied, 10 = completely satisfied) at 1 month post-operatively, consistent with the assessment approach used in published TOETVA series [4,5]. Data were analysed using IBM SPSS v20.0. Continuous variables are expressed as mean $\pm$ standard deviation (SD) or mean with range; categorical variables as frequencies and proportions. Descriptive statistics only were applied; no inferential hypothesis testing was performed.

3. RESULTS

3.1. Patient Characteristics

Sixty-five patients were included (56 female, 86.2%; mean age 31 ± 9.7 years) (Table 1). Most cases were detected incidentally on routine health

surveillance (73.8%). All patients had normal thyroid function and no prior neck surgery. Mean nodule diameter was 1.65 ± 0.21 cm. On ultrasonography, 73.8% were classified as TIRADS 3 and 26.2% as TIRADS 4.

Table 1. Baseline patient characteristics (n = 65)

Characteristic	n / Mean $\pm$ SD	% / Range
Age (years)		
Mean age	31 ± 9.7	—
≤ 30 years	32	49.2%
31–45 years	28	43.1%
> 45 years	5	7.7%
Sex		
Female	56	86.2%
Male	9	13.8%
BMI (kg/m ²)	21.8 ± 2.4	—
Clinical Presentation		
Incidental finding (routine health check)	48	73.8%
Self-palpated neck mass	17	26.2%
Mild dysphagia	11	16.9%
Pre-operative hoarseness	0	0%
Nodule Characteristics		
Largest diameter (cm)	1.65 ± 0.21	—
Right lobe	39	60.0%
Left lobe	22	33.8%
Isthmus	2	3.1%
Bilateral	2	3.1%
Ultrasonographic Classification		
TIRADS 3	48	73.8%
TIRADS 4	17	26.2%

BMI: body mass index; TIRADS: Thyroid Imaging Reporting and Data System. † Dysphagia is a presenting symptom and is not mutually exclusive with mode of detection; proportions do not sum to 100%.

3.2. Perioperative Outcomes and Cosmetic Satisfaction

Hemithyroidectomy was the predominant procedure (93.8%); total thyroidectomy and isthmusectomy each 3.1% (Table 2). Mean operative time was 90 min (range 70–120); mean estimated blood loss 6.67 ± 2.3 mL; no transfusion required. Mean hospital stay was 7.1 ± 1.8 days. Postoperative pain (day 1) was mild (VAS 0–3) in 60.0% and moderate (VAS 4–6) in 40.0%; no patient experienced severe pain. Cosmetic satisfaction VAS at 1 month was 7.4 ± 0.9 , with 55.4% of patients reporting very high satisfaction (VAS ≥ 8) and 38.5% satisfied (VAS 5–7).

Table 2. Perioperative outcomes and cosmetic satisfaction (n = 65)

Variable	Value
Perioperative Parameters	
Operative time, mean (range), min	90 (70–120)
Estimated blood loss, mean $\pm$ SD, mL	6.67 ± 2.3
Hospital stay, mean $\pm$ SD, days	7.1 ± 1.8
Type of Resection	
Right hemithyroidectomy	39 (60.0%)
Left hemithyroidectomy	22 (33.8%)
Total thyroidectomy	2 (3.1%)
Isthmusectomy	2 (3.1%)
Postoperative Pain — VAS (0–10)	
Day 1 pain VAS, mean $\pm$ SD	3.2 ± 1.1
Mild (0–3)	39 (60.0%)
Moderate (4–6)	26 (40.0%)
Severe (7–10)	0 (0%)
Cosmetic Satisfaction — VAS (0–10)	
1-month VAS, mean $\pm$ SD	7.4 ± 0.9
Very satisfied (VAS 8–10)	36 (55.4%)
Satisfied (VAS 5–7)	25 (38.5%)
Not satisfied (VAS 0–4)	4 (6.2%)

VAS: visual analogue scale (0 = no pain/ completely dissatisfied, 10 = worst pain/ completely satisfied).

3.3. Complications and Conversions

Complications were exclusively transient. Transient mental nerve paraesthesia (lower-lip numbness) occurred in 8 patients (12.3%), resolving spontaneously without intervention. Temporary hoarseness attributable to recurrent laryngeal nerve neuropraxia was observed in 5 patients (7.7%), with complete vocal recovery within 2–4 weeks; two further patients (3.1%) demonstrated delayed recovery beyond four weeks but ultimately resolved. Cervical seroma without wound infection occurred in 3 patients (4.6%), managed conservatively. Transient hypocalcaemia was recorded in one patient (1.5%) undergoing total thyroidectomy. No permanent vocal cord paralysis, permanent hypocalcaemia, or aerodigestive tract injury was identified.

Two patients (3.1%) required intraoperative conversion to open thyroidectomy: both due to uncontrolled intraoperative haemorrhage. In both cases, conversion was undertaken immediately to allow direct open access for haemostatic control, as the limited working space and angled endoscopic view of TOETVA preclude adequate haemostatic management in such situations. Both conversions occurred within the first 10 cases, consistent with TOETVA learning-curve dynamics. Table 3 summarises outcomes compared with major international series.

Table 3. Comparison with major international TOETVA series

Parameter	MH175 (n=65)	Anuwong 2016	Russell 2021	Lira 2021
Female (%)	86.2	78.3	~72.0	87.1
Mean age (yrs)	31 ± 9.7	40.3 ± 12.1	~45	40
Op time (min)	90	109 ± 35	~119†	NR
Blood loss (mL)	6.67	12.4	NR	NR

Parameter	MH175 (n=65)	Anuwong 2016	Russell 2021	Lira 2021
Hospital stay (d)	7.1	2.1	~1	NR
Mental paraesthesia (%)	12.3	13.1	NR	NR
Transient hoarseness (%)	7.7	4.6	4.5	7.6
Transient hypocalcaemia (%)	1.5	4.1	18.2 [‡]	4.0
Permanent hypocalcaemia (%)	0	0.7	≤1.5 [§]	0.8
Cervical seroma (%)	4.6	1.8	NR	NR
Conversion to open (%)	3.1	2.4	≤1.5 [§]	0.7
Permanent complications (%)	0	NR	1.5 [§]	NR

NR: not reported. [†] Median from Russell JO et al. 2021 (same institution). [‡] Higher rate due to greater proportion of total thyroidectomy in North American cohort. [§] Composite major-complication rate; individual components not disaggregated.

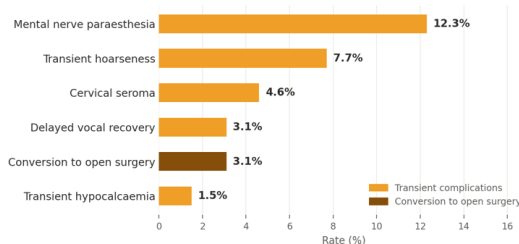


Figure 1. Postoperative complication rates following TOETVA at Military Hospital 175 (n = 65). All complications were transient and resolved without permanent sequelae

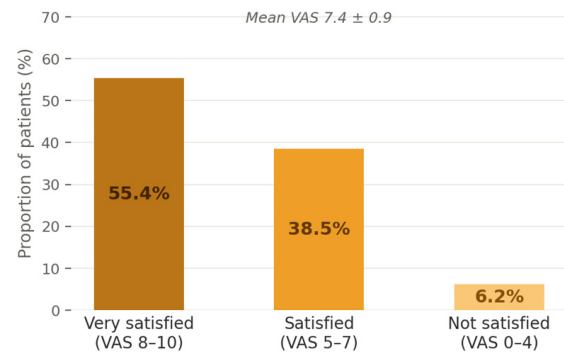


Figure 2. Cosmetic satisfaction VAS at 1 month post-TOETVA (n = 65). VAS: visual analogue scale (0 = completely dissatisfied, 10 = completely satisfied).

4. DISCUSSION

4.1. Epidemiological Profile: Cite accordingly the Tables/Figures after each number/result noted in discussion.

The marked female predominance (86.2%) (Table 1) exceeds proportions reported in Western series (72–79%) but is consistent with the established epidemiology of thyroid nodular disease across Asian populations. The relatively young mean age (31 ± 9.7 years) (Table 1), with nearly half the cohort aged 30 years or under (49.2%) (Table 1), reflects the demographic profile of a military hospital population. Young female patients are recognised as the group most likely to prioritise avoidance of a visible cervical scar [2], making TOETVA particularly well suited as the index surgical approach for this cohort.

4.2. Operative Efficiency and Learning Curve

The mean operative time of 90 minutes compares favourably with early reports from pioneering centres: Anuwong's original series (109 ± 35 min) and the Johns Hopkins North American cohort (median ~119 min) [4,5]. The mean nodule diameter of 1.65 cm (Table 1), predominance of unilateral resection (93.8%) (Table 2), and growing

surgical team experience likely contributed to this efficiency. Both conversions occurred early in the series, consistent with the well-described learning curve of 35–40 cases required to reach procedural stability [8]. As institutional volume grows, operative time and conversion rates may be expected to decrease further.

The mean hospital stay of 7.1 days (Table 2) is longer than reported in international series (Anuwong 2016: 2.1 days; Russell 2021: approximately 1 day). This reflects institutional protocol rather than clinical necessity: as a military hospital, Military Hospital 175 applies a standardised post-operative monitoring schedule that includes mandatory observation for recurrent laryngeal nerve function, serum calcium monitoring, and wound assessment before discharge. With accumulating experience and protocol optimisation, length of stay is expected to shorten in subsequent series.

Thyroid Carcinoma is a contre-indication of this technique? How about anatomopathological result of these 65 patients

Regarding oncological suitability, our institutional indication and contraindication criteria for TOETVA were adapted from those applied at leading Vietnamese thyroid surgery centres, including the National Cancer Hospital (Bệnh viện K), Hanoi Medical University Hospital, and the University Medical Center at Ho Chi Minh City, where general indications permit both benign thyroid nodules and selected low-risk differentiated thyroid carcinomas, while contraindications include prior neck surgery or irradiation and active oral cavity infection. As Military Hospital 175 was in the earliest phase of programme implementation, three staff members were sent for structured training at these major centres, and the institution applied a substantially more conservative selection strategy: benign nodules were managed according to our general size threshold (index nodule ≤ 4 cm), while thyroid malignancy would have been accepted

only for solitary papillary thyroid carcinoma confined to one lobe, under 2 cm, without capsular invasion (cT1N0M0); suspected or confirmed carcinoma with capsular invasion, extrathyroidal extension, or nodal metastasis was considered a contraindication to TOETVA at our institution during this period. Consistent with this conservative, benign-prioritising selection strategy, final histopathology confirmed benign disease in all 65 patients (100%); no case of malignancy was encountered in this series. As surgical experience accumulates, cautious extension of indications to appropriately selected low-risk malignancies, in line with practice at established Vietnamese centres, may be considered in future series.

4.3. Complication Profile

The rate of transient mental nerve paraesthesia (12.3%) (Figure 1) falls within the commonly reported range of 5–15% and is virtually identical to Anuwong's original series (13.1%) [4]. All cases resolved without intervention, confirming neuropraxia. Transient hoarseness (7.7%) (Figure 1) was consistent with Lira et al. (7.6%) [9] and somewhat higher than Russell et al. (4.5%) [5], reflecting cohort differences rather than inferior nerve management. The notably higher transient hypocalcaemia rate in the Russell cohort (18.2%) reflects its substantially greater proportion of total thyroidectomies; our low rate (1.5%) is commensurate with our predominantly hemithyroidectomy practice. The cervical seroma rate of 4.6% (Figure 1) —higher than Anuwong's 1.8%—is attributable to the learning-curve phase of subplatysmal flap dissection, in which incomplete haemostasis and wider dead-space creation are more frequent; no case required surgical drainage and all resolved with conservative management. The absence of permanent complications is consistent with benchmarks from established high-volume centres.

Need discussion of 2 cases with hemorrhage's complication?

Both conversions to open surgery occurred

within the first 10 cases of the series, during the earliest phase of the institutional learning curve, when the surgical team had limited experience controlling the superior thyroid pedicle and the lateral thyroid veins under the constrained, angled endoscopic view characteristic of TOETVA. In both cases, bleeding from these structures could not be safely controlled endoscopically, and conversion to open access was undertaken promptly to secure haemostasis. No further conversions occurred beyond these two cases; from approximately the 20th case onward, the team's proficiency in vascular control improved substantially, reflecting growing familiarity with the LigaSure vessel-sealing device and ultrasonic scalpel for management of the superior pedicle and lateral thyroid venous drainage. This pattern is consistent with published learning-curve data indicating that proficiency in critical steps such as pedicle control is typically achieved after approximately 20–40 cases, and underscores the importance of structured, stepwise case selection and mentorship during early programme adoption.

4.4. Cosmetic Satisfaction

Cosmetic satisfaction VAS at 1 month was 7.4 ± 0.9 , with 55.4% of patients reporting very high satisfaction ($\text{VAS} \geq 8$) and 38.5% satisfied ($\text{VAS} 5\text{--}7$). This result underscores the defining advantage of TOETVA over any neck-incision approach — the complete absence of a visible cervical scar is immediately apparent to patients from the earliest post-operative assessment. Anuwong's original series reported a mean cosmetic VAS of 8.1 at one month in a comparable cohort [4], and our result of 7.4 reflects the early-phase adaptation period; cosmetic satisfaction is expected to improve as intraoral wound healing progresses beyond the first month. The high satisfaction rate supports the technique's particular suitability for young female patients in whom avoidance of a visible cervical scar carries the greatest psychosocial benefit [2].

4.5. Limitations

The absence of a concurrent open-surgery control group precludes direct comparative conclusions. The short follow-up duration — up to 1 month depending on the timing of each patient's surgery — is insufficient to evaluate long-term nodule recurrence rates or sustained quality-of-life trajectories. Cosmetic satisfaction was assessed at only one month and by a single-item VAS rather than a validated thyroid-specific cosmesis instrument such as the Patient Scar Assessment Scale. Future work should incorporate a prospective comparative design with follow-up ≥ 12 months, formal learning-curve analysis, and validated patient-reported outcome measures.

5. CONCLUSION

TOETVA can be implemented safely and efficiently within a structured military surgical programme, yielding perioperative outcomes comparable to leading international series and high patient-reported cosmetic satisfaction that improves meaningfully over time. The technique should be offered as a viable and safe surgical option for eligible patients—particularly young women in whom scarless surgery carries the greatest psychosocial benefit. Standardisation and expansion within Vietnamese military and civilian referral centres, supported by prospective outcome registries with longer follow-up, will be essential to confirming long-term safety and durability of cosmetic outcomes.

6. ACKNOWLEDGMENTS

The authors thank the nursing and anaesthesia teams of Military Hospital 175 for their support throughout this series. The authors declare no conflict of interest. No external funding was received for this study.

REFERENCES

1. Tran NQ, Le BH, Hoang CK, Nguyen HT, Thai TT. Prevalence of Thyroid Nodules and Associated Clinical Characteristics: Findings from a Large Sample of People Undergoing Health Checkups at a University Hospital in Vietnam. *Risk Manag Healthc Policy*. 2023 May 17;16:899–907. doi:10.2147/RMHP.S410964 PubMed PMID: 37220482; PubMed Central PMCID: PMC10200104.
2. Sethukumar P, Ly D, Awad Z, Tolley NS. Scar satisfaction and body image in thyroidectomy patients: prospective study in a tertiary referral centre. *J Laryngol Otol*. 2018 Jan;132(1):60–7. doi:10.1017/S0022215117002158 PubMed PMID: 29143715.
3. Miccoli P, Berti P, Raffaelli M, Conte M, Materazzi G, Galleri D. Minimally invasive video-assisted thyroidectomy. *Am J Surg*. 2001 Jun;181(6):567–70. doi:10.1016/s0002-9610(01)00625-0 PubMed PMID: 11513788.
4. Anuwong A. Transoral Endoscopic Thyroidectomy Vestibular Approach: A Series of the First 60 Human Cases. *World J Surg*. 2016 Mar;40(3):491–7. doi:10.1007/s00268-015-3320-1 PubMed PMID: 26546193.
5. Russell JO, Razavi CR, Shaeer M, Liu RH, Chen LW, Pace-Asciak P, et al. Transoral Thyroidectomy: Safety and Outcomes of 200 Consecutive North American Cases. *World J Surg*. 2021 Mar;45(3):774–81. doi:10.1007/s00268-020-05874-8 PubMed PMID: 33205227.
6. Xuan Nguyen H, Nguyen HX, Thi Hoang H, Van Le Q. Quality of Life and Surgical Outcome of Transoral Endoscopic Thyroidectomy Vestibular Approach (TOETVA) versus Open Thyroid Surgery: Experience from a Single Center in Vietnam. *J Thyroid Res*. 2022 Oct 11;2022:2381063. doi:10.1155/2022/2381063 PubMed PMID: 36268522; PubMed Central PMCID: PMC9578921.
7. Delgado DA, Lambert BS, Boutris N, McCulloch PC, Robbins AB, Moreno MR, et al. Validation of Digital Visual Analog Scale Pain Scoring With a Traditional Paper-based Visual Analog Scale in Adults. *J Am Acad Orthop Surg Glob Res Rev*. 2018 Mar;2(3):e088. doi:10.5435/JAAOS-Global-D-17-00088 PubMed PMID: 30211382; PubMed Central PMCID: PMC6132313.
8. Razavi CR, Vasiliou E, Tufano RP, Russell JO. Learning Curve for Transoral Endoscopic Thyroid Lobectomy. *Otolaryngol--Head Neck Surg Off J Am Acad Otolaryngol-Head Neck Surg*. 2018 Oct;159(4):625–9. doi:10.1177/0194599818795881 PubMed PMID: 30126330; PubMed Central PMCID: PMC6214162.
9. Lira RB, De Cicco R, Rangel LG, Bertelli AA, Duque Silva G, de Medeiros Vanderlei JP, et al. Transoral endoscopic thyroidectomy vestibular approach: Experience from a multicenter national group with 412 patients. *Head Neck*. 2021 Nov;43(11):3468–75. doi:10.1002/hed.26846 PubMed PMID: 34382715.