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Outcomes of Transoral Endoscopic vs Robotic Thyroidectomy: A Propensity Score-Matched Retrospective Analysis in a Single Tertiary Center in Thailand

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Background

Transoral thyroidectomy is an innovative minimally invasive approach that avoids a neck scar and improves cosmetic outcomes. This technique can also reduce pain and speed recovery compared to open surgery. Transoral endoscopic thyroidectomy vestibular approach (TOETVA) and transoral robotic thyroidectomy (TORT) are the two main methods used. This study is the first in Thailand to compare their outcomes in patients treated at Police General Hospital, Bangkok.

Methods

We conducted a retrospective analysis of patients who underwent TOETVA or TORT between January 2023 and December 2024. Baseline characteristics, operative results, and postoperative complications were collected. Statistical analysis was performed using R Studio. Propensity score matching (PSM) was applied to adjust for potential confounding factors. A total of 147 patients underwent TOETVA and 42 patients underwent TORT before matching. After matching, 42 patients were included in each group.

Table 1. Baseline Demographic and Clinical Characteristics Before and After Propensity Score Matching

Variable	Before Propensity Score Matching			After Propensity Score Matching		
	TOETVA (n=147)	TORT (n=42)	p-value	TOETVA (n=42)	TORT (n=42)	p-value
Age, years (Mean ± SD)	46.08 ± 13.43	46.07 ± 10.73	0.996	46.55 ± 11.88	46.07 ± 10.73	0.848
Sex, n (%)			0.959			1.000
Female	141 (95.9%)	41 (97.6%)		42 (100%)	41 (97.6%)	
Male	6 (4.1%)	1 (2.4%)		0 (0.0%)	1 (2.4%)	
BMI, kg/m ² (Mean ± SD)	22.53 ± 4.24	23.07 ± 4.81	0.480	22.95 ± 4.27	23.07 ± 4.81	0.900
ASA classification, n (%)			0.739			0.480
I	131 (89.1%)	36 (85.7%)		39 (92.9%)	36 (85.7%)	
II	16 (10.9%)	6 (14.3%)		3 (7.1%)	6 (14.3%)	
Indication, n (%)			0.181			0.820
Benign	115 (78.2%)	28 (66.7%)		26 (61.9%)	28 (66.7%)	
Malignancy	32 (21.8%)	14 (33.3%)		16 (38.1%)	14 (33.3%)	
Diameter of largest tumor, cm	2.28 ± 1.11	1.95 ± 0.96	0.084	1.98 ± 1.04	1.95 ± 0.96	0.897
Extent of Surgery, n (%)			0.335			0.827
Lobectomy	88 (59.9%)	21 (50.0%)		19 (45.2%)	21 (50.0%)	
Total Thyroidectomy	59 (40.1%)	21 (50.0%)		23 (54.8%)	21 (50.0%)	
Central Neck Dissection, n (%)			0.097			1.000
Yes	26 (17.7%)	13 (31.0%)		14 (33.3%)	13 (31.0%)	
No	121 (82.3%)	29 (69.0%)		28 (66.7%)	29 (69.0%)	

Table 2. Operative Outcomes and Postoperative Complications

Variable	Before Propensity Score Matching			After Propensity Score Matching		
	TOETVA (n=147)	TORT (n=42)	p-value	TOETVA (n=42)	TORT (n=42)	p-value
Operative time (minutes), mean ± SD	171.2 ± 57.4	212.6 ± 67.5	<0.001	181.7 ± 62.8	212.6 ± 67.5	0.032
Estimated blood loss (mL), mean ± SD	22.4 ± 12.1	28.3 ± 7.6	<0.001	26 ± 15.2	28.3 ± 7.6	0.367
Conversion to open surgery, n (%)	0 (0.0%)	0 (0.0%)	NA	0 (0.0%)	0 (0.0%)	NA
Length of hospital stay (days), mean ± SD	2.1 ± 0.7	2.3 ± 0.5	0.014	2 ± 0.0	2.3 ± 0.5	<0.001
Postoperative complications, n (%):						
- Recurrent laryngeal nerve (RLN) injury	5 (3.4%)	0 (0.0%)	0.588	3 (7.1%)	0 (0.0%)	0.241
- Hypoparathyroid	23 (15.6%)	12 (28.6%)	0.072	7 (16.7%)	12 (28.6%)	0.297
-Hematoma	4 (2.7%)	2 (4.8%)	0.577	2 (4.8%)	0 (0.0%)	0.494
- Seroma	5 (3.4%)	3 (7.1%)	0.379	0 (0.0%)	3 (7.1%)	0.241
- Tracheal injury	1 (0.7%)	0 (0.0%)	1.000	0 (0.0%)	0 (0.0%)	NA
- Surgical site infection	0 (0.0%)	0 (0.0%)	NA	0 (0.0%)	0 (0.0%)	NA
Overall complication rate, n (%):	35 (23.8%)	13 (31.0%)	0.421	10 (23.8%)	13 (31.0%)	0.625
Readmission within 30 days, n (%):	0 (0.0%)	0 (0.0%)	NA	0 (0.0%)	0 (0.0%)	NA

Results

After matching, the average operative time was significantly shorter in the TOETVA group compared to the TORT group (181.7 ± 62.8 vs 212.6 ± 67.5 minutes, p=0.032). Length of hospital stay was also shorter in the TOETVA group (2.0 vs 2.3 ± 0.5 days, p<0.001). Estimated blood loss and conversion to open surgery were similar between groups. Rates of postoperative complications, including recurrent laryngeal nerve injury, hypoparathyroidism, seroma, hematoma, and tracheal injury, showed no significant differences between the two techniques (overall complication rate: 23.8% vs 31.0%, p=0.625).

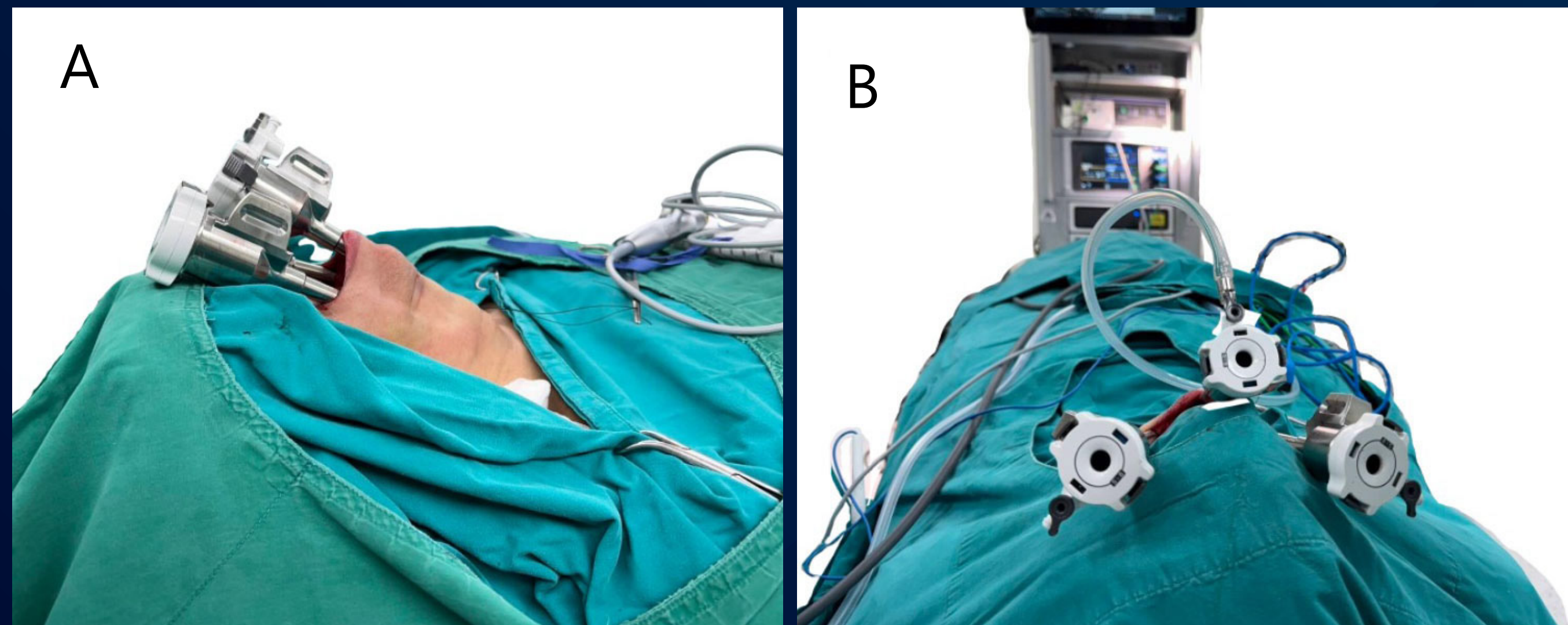


Figure 1. Three robotic port insertion for transoral robotic thyroidectomy (TORT). (A) Lateral view demonstrating placement of the transoral vestibular access system at the lower oral vestibule. (B) Anteroposterior view showing the three transoral robotic cannulas positioned in a triangular configuration-one central camera port and two lateral instrument ports.

Conclusion

Both TOETVA and TORT are feasible and safe options for thyroid surgery with comparable complication rates. However, TOETVA was associated with shorter operative time and reduced hospital stay. As the first report of TORT outcomes in Thailand, these findings may help guide surgical approach selection in appropriately selected patients.