



Pharyngeal-Phase Dysphagia after Thyroidectomy with Central Compartment Neck Dissection

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Purpose

Surgical management of thyroid cancer often includes central neck dissection, yet its impact on postoperative dysphagia remains insufficiently studied, therefore, this study aimed to evaluate swallowing dysfunction after thyroidectomy with central neck dissection using videofluoroscopic swallowing study (VFSS) analysis.

Material and Methods

- This retrospective study was conducted at a single tertiary hospital between August 2018 and October 2025. Patients who underwent thyroidectomy with central compartment neck dissection and received VFSS were included. Patients with insufficient VFSS data or clinical information, previous head and neck surgery, or pre-existing neurologic disease were excluded. The VFSS protocol comprised semisolid (IDDSI levels 2 and 3), porridge (IDDSI level 4), and liquid (IDDSI level 0) boluses administered in small (5 mL) and large (15 mL) volumes.
- Swallowing severity was evaluated by Videofluoroscopic Dysphagia Scale (VDS, 0-100, higher scores indicate greater severity), and aspiration risk was assessed with the Penetration–Aspiration Scale (PAS, 1-8, higher scores indicate greater severity). The mean value of VDS and PAS scores were calculated and its association with clinicopathological factors, including lymph node metastasis, lymphatic invasion, lymphocytic thyroiditis, adenomatous hyperplasia, and pathology subtype (anaplastic versus papillary carcinoma), were evaluated. Due to the small sample size, all group comparisons were performed using the Mann–Whitney U test and P value < 0.05 was considered statistically significant.

Results

- Total 23 patients were analyzed, with a mean interval of 8.8 days from surgery to VFSS.
- No oral phase abnormalities were observed. Pharyngeal phase abnormalities were observed in all patients, with a mean VDS total score of 22.3 ± 12.7 ; triggering of pharyngeal swallow (N=6, 26.1%), vallecular residue (N=21, 91.3%), reduced laryngeal elevation (N=16, 69.6%), pyriform sinus residue (N=9, 23.1%), coating of pharyngeal wall (N=12, 52.2%), and aspiration (N=11, 47.8%).(Table 2)
- The mean PAS score was 3.3 ± 2.9 . Aspiration (PAS ≥ 6) occurred in 8 patients (34.8%), exclusively during swallowing. (Table 3) No significant differences in VDS scores were observed according to lymph node metastasis (P=0.8), lymphatic invasion (P=0.9), lymphocytic thyroiditis (P=0.8), or adenomatous hyperplasia (P=0.9). Patients with anaplastic carcinoma showed higher VDS total scores (31.0 ± 11.3 vs. 20.5 ± 12.2 ; P=0.29) and PAS scores (5.5 ± 2.6 vs. 2.9 ± 2.7 ; P=0.18) compared with those with papillary carcinoma patients. However, these differences did not reach statistical significance.

Table 1. Patients' characteristics

Characteristics (N=24)	N (%) or Mean (SD)
1. Demographic characteristics	
Sex, N(%)	
Male	3(13.0)
Female	20 (87.0)
Age, yr	44.1 (17.2)
Height, cm	159.3 (7.9)
Weight, kg	61.1 (16.4)
Body mass index, kg/m ²	24.0 (5.7)
2. Perioperative characteristics	
Operation duration, min	119.5 (76.8)
Approaching side	
Right	7 (30.4)
Left	16 (69.6)
3. Postoperative characteristics	
Pathology	
Papillary carcinoma	19 (82.6)
Anaplastic carcinoma	4 (17.4)
Combined benign lesion	
Lymphocytic thyroiditis	9 (39.1)
Adenomatous hyperplasia	9 (39.1)
Invasion	
Lymphatic invasion	9 (39.1)
Vascular invasion	3 (13.0)
Lymph node metastasis	10 (41.7)
Post-surgery to VFSS period	9.1 (16.8)

Table 2. Videofluoroscopic swallowing findings

Videofluoroscopic swallowing findings	Score, mean (SD)	No. of dysfunction (%)
Oral phase		
Lip closure	0.0 (0.0)	0.0 (0.0)
Bolus formation	0.0 (0.0)	0.0 (0.0)
Mastication	0.0 (0.0)	0.0 (0.0)
Apraxia	0.0 (0.0)	0.0 (0.0)
Tongue to palate contact	0.0 (0.0)	0.0 (0.0)
Premature bolus loss	0.0 (0.0)	0.0 (0.0)
Oral transit time	0.0 (0.0)	0.0 (0.0)
Pharyngeal phase		
Triggering of pharyngeal swallow	1.2 (2.0)	6 (26.1)
Vallecular residue	2.7 (1.4)	21 (91.3)
Laryngeal elevation	6.3 (4.2)	16 (69.6)
Pyriform sinus residue	2.5 (3.5)	9 (39.1)
Coating of pharyngeal wall	4.7 (4.6)	12 (52.2)
Pharyngeal transit time	0.0 (0.0)	0 (0.0)
Aspiration	5.0 (5.6)	11 (47.8)
VDS, oral phase subscore	0.0 (0.0)	
VDS, pharyngeal phase subscore	22.3 (12.7)	
VDS, total score	22.3 (12.7)	

Table 3. Aspiration after thyroidectomy and central compartment neck dissection

Parameters	N (%)
Penetration-aspiration scale (PAS) score	
1	12 (52.2)
2	1 (4.3)
3	1 (4.3)
4	1 (4.3)
5	0 (0.0)
6	0 (0.0)
7	7 (30.4)
8	1 (4.3)
Aspiration type	
Pre-swallowing aspiration	0 (0.0)
During-swallowing aspiration	8 (100.0)
Post-swallowing aspiration	0 (0.0)
Aspirate	
Solid	0 (0.0)
Semisolid	1 (12.5)
Liquid	7 (87.5)
5mL	3 (37.5)
15mL	4 (50.0)

Conclusion

This VFSS-based study demonstrated that thyroidectomy with central neck dissection is associated with pharyngeal-phase–dominant dysphagia. These findings highlight the importance of evaluating pharyngeal swallowing function after surgery, and further studies with larger cohorts are needed.