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Tract Site Seeding of Papillary Thyroid Cancer after Transoral Endoscopic Thyroidectomy - Case Report

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Introduction

Thyroid cancer is one of the most common types of cancers in women, and surgery is the treatment of choice in many cases. Many methods, including endoscopic and robotic options, have been developed to reduce neck scarring. Transoral thyroidectomy is based on the concept of natural orifice transluminal endoscopic surgery (NOTES), which further maximizes cosmetic outcomes by using mucosal rather than skin incisions. The most commonly used type is the transoral endoscopic thyroidectomy vestibular approach (TOETVA), in which three incisions in the vestibule of the mouth provide a pathway to the thyroid. Despite its many advantages, this relatively novel technique and the limited range of motion can result in unexpected complications. Here, we present a rare case of track-site seeding after TOETVA in a patient who was subsequently diagnosed with papillary thyroid cancer.

Case report

A 47-year-old woman presented to the Gangnam Severance Hospital Thyroid Cancer Center for evaluation of multiple metastatic neck lymph nodes confirmed as carcinomas of thyroid origin. The patient had undergone left thyroidectomy via TOETVA four years previously at another hospital because of a thyroid nodule diagnosed as a follicular adenoma. Two and a half years later, neck computed tomography (CT) at a separate hospital revealed several suspicious neck lymph nodes at levels Ia and VI, for which fine-needle aspiration biopsy (FNAB) results did not reveal any malignancy (Figure 1a).

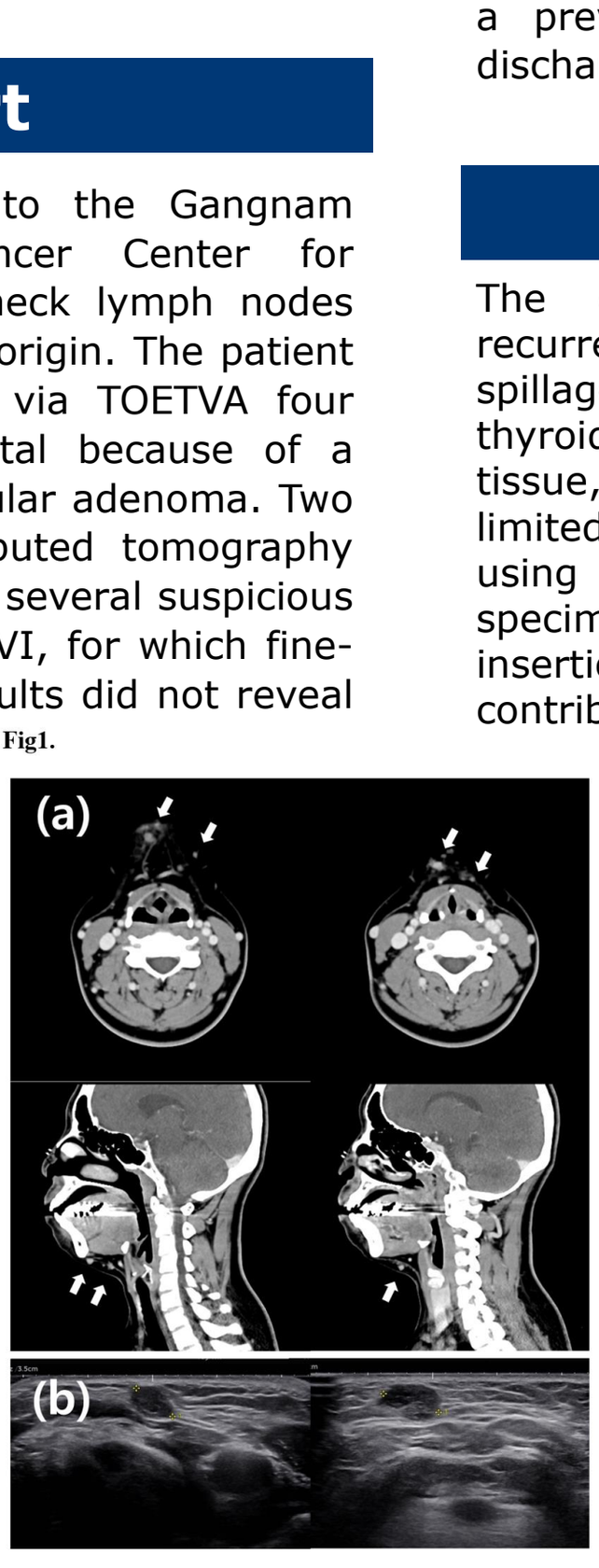
However, follow-up ultrasonography showed nodules increasing in size and number at these levels, and an excisional biopsy was performed (Figure 1b). Eight palpable lymph node-like masses along the submental region of the thyroid bed under the platysmal and strap muscles were excised. All eight were confirmed to be carcinomas of the thyroid origin in the final pathological report.

The locations of the masses in the anterior neck prior to the second surgery coincided with the surgical track of the central endoscope in the TOETVA, and the patient did not have any history of surgery other than the previous left thyroidectomy. Therefore, further imaging studies and a review of pathological slides were performed under the impression of tumor recurrence from the transoral tract site seeding. Ultrasonography revealed multiple suspicious nodules of various sizes in the left thyroid bed and subcutaneous tissue at levels I, IIa, and VI. Positron emission tomography-CT and thyroid CT revealed an approximately 4.2 cm cavitary lesion with mildly hypermetabolic walls in the submental area, matching the ultrasound findings. No suspicious nodules were observed in the right or lateral neck. Chest CT showed no signs of lung metastasis.

A pathological review of a right neck lymph node from a previous mass excision confirmed the findings of metastatic papillary carcinoma. Subsequent review of the left thyroid gland from the initial thyroidectomy revealed tumor cells with nuclear membrane irregularity, intranuclear grooves, and clear nuclei consistent with papillary carcinoma, and the final diagnosis was invasive encapsulated follicular variant papillary thyroid cancer (EFVPTC).

Hence, a complete total thyroidectomy with regional neck lymph node dissection from the submental region to the left level III region was performed. Frozen pathologic reports during surgery revealed one subcutaneous specimen with multiple nodules of papillary thyroid carcinoma up to 2 cm in the left level III. The left central tissue was identified as benign thyroid tissue. Other subcutaneous specimens, lymph nodes, and strap muscles were tumor-free. The authors speculated that most of the lesions observed in the imaging study were postoperative findings from a previous neck mass excision. The patient was discharged without acute complications.

Fig1.



Discussion/conclusion

The exact mechanism underlying postoperative recurrence of tract seeding remains clear. Direct tumor spillage at the operation site is likely, especially in thyroid cancer, due to the friability of the thyroid tissue, indirect handling using endoscopic devices, and limited working space. Surgical factors such as not using a bag when retrieving the tumor specimen, specimen fragmentation, and repeated retraction and insertion of a contaminated instrument may also contribute to seeding.

Leakage of gas containing aerosolized tumor cells has also been proposed, although recent studies have reported that the effect may be minimal compared to traumatic tumor handling itself. In this case, the initial pathological report for the TOETVA described the left thyroid as intact; whether there were any complications regarding plastic bags or peri-port gas leakage is unknown due to difficulties in obtaining surgical records. Tumor invasiveness is also theorized to be an association; however, the final pathological diagnosis in this case was invasive encapsulated FVPTC, a well-differentiated thyroid cancer.
Hence, port site metastasis is most likely the result of various mechanisms, among which the surgeon's technique plays an important role.

Conclusion

TOETVA has many advantages over conventional thyroidectomy, and the inherent limitations of remote surgery require surgeons to pay special attention to clean and careful surgical manipulation.
Routine follow-up of post-thyroidectomy patients, regardless of malignancy, may also aid in the early diagnosis of such rare complications.