

Papillary Carcinoma Arising In A Thyroglossal Duct Cyst: Diagnostic Pitfalls And Surgical Decision-Making

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Abstract

The most prevalent congenital midline neck masses are thyroglossal duct cysts (TGDCs), which are commonly benign. Only 1% to 2% of cases progress to malignant transformation, of which papillary carcinoma is of the most prevalent histological subtype. The best course of action for surgery, especially the role of a total thyroidectomy, is still up for debate, and preoperative diagnosis is difficult. A 25-year-old woman arrived with a gradually growing midline neck swelling that was painless. Imaging revealed a cystic lesion with microcalcifications and an increasing intracystic solid component. Papillary cancer was suspected by fine-needle aspiration cytology (Bethesda V). FDG PET-CT revealed intense uptake within the intracystic solid component without evidence of thyroid or nodal involvement. The patient had underwent Sistrunk procedure with total thyroidectomy. Histopathology showed no thyroid gland malignancy, thyroid follicles inside the cyst wall, and conventional papillary carcinoma coming from the cyst wall of the thyroglossal duct. There were Negative surgical margins. It is rare for papillary cancer to develop in a TGDC, and it is usually discovered after surgery. The diagnostic difficulties and the justification for customized surgical decision-making are demonstrated by this example. Some people with a history of cytological suspicion of cancer may benefit from a total thyroidectomy to help with surveillance, even if there is no visible thyroid involvement.

Keywords: Papillary carcinoma; Thyroglossal duct cyst; Total thyroidectomy; Midline neck mass

Introduction

The thyroid gland descends from the foramen cecum to its final pretracheal position, leaving behind an embryological remnant called the thyroglossal duct. A thyroglossal duct cyst (TGDC), which results from the failure of involution of this tract, is the most prevalent congenital midline neck mass(1). Although TGDCs are mostly benign, malignant change is uncommon and only occurs in 1% to 2% of cases. Among these, papillary carcinoma accounts for nearly 85–90% of malignancies arising within TGDCs. The clinical presentation of malignant TGDC closely mimics that of benign cysts, resulting in frequent incidental diagnosis following surgical excision(2). Moreover, there is no consensus regarding optimal management, particularly concerning the need for total thyroidectomy in patients without clinically or radiologically evident thyroid gland involvement. The diagnostic difficulties and surgical decision-making associated with a case of papillary carcinoma that developed in a TGDC are covered in this report.

Case Presentation

For two months, a 25-year-old woman had a swelling in the middle of her neck. The swelling started slowly, increased gradually, and caused no pain. There was no history of radiation exposure, voice changes, dysphagia, dyspnea, or thyroid dysfunction symptoms. A well-defined, non-tender, around 2 × 2 cm midline neck swelling at the level of the thyroid cartilage was discovered during the clinical examination. Deglutition and tongue protrusion caused the swelling to move. There was no palpable cervical lymphadenopathy, and the skin over the swelling was normal (figure 1). On contrast-enhanced computed tomography of the neck, a well-defined, thin-walled cystic lesion with an increasing intracystic solid component consisting of several microcalcifications was observed at the level of the thyroid cartilage in the right paramedian strap muscle plane. These characteristics pointed to a malignantly transformed thyroglossal duct cyst. Few mildly enlarged bilateral level IB and II lymph nodes with

reactive morphology were noted (figure 2). Fine-needle aspiration cytology revealed dispersed thyroid follicular epithelial cells with nuclear grooves and intranuclear cytoplasmic inclusions, papillary fragments, and monolayered sheets, which increased the risk of papillary cancer (Bethesda category V).

FDG PET-CT showed intense uptake within the intracystic solid component (SUVmax 19.6) with no evidence of metabolically active cervical lymph nodes or distant metastases. No metabolically active lesion has been determined in the thyroid gland. In view of preoperative cytological suspicion of malignancy and to facilitate postoperative surveillance, the patient had a total thyroidectomy and the Sistrunk surgery to remove the thyroglossal duct cyst. There was no dissection of lymph nodes. Conventional papillary carcinoma originating from the thyroglossal duct cyst wall was confirmed by histopathological analysis. The tumour's largest measurement was 2cm.

Thyroid follicles were identified within the cyst wall, confirming its thyroglossal origin. The thyroid gland showed multinodular goitre without evidence of malignancy. Surgical margins were free of tumor (figure 3).



FIGURE 1 .PREOPERATIVE IMAGE OF THYROGLOSSAL CYST



FIGURE 2. CT NECK IMAGE OF THYROGLOSSAL CYST



FIGURE 3. INTRAOPERATIVE IMAGE OF THYROID WITH THYROGLOSSAL CYST



FIGURE 4. INTRAOPERATIVE IMAGE OF TOTAL THYROIDECTOMY SPECIMEN WITH THYROGLOSSAL CYST

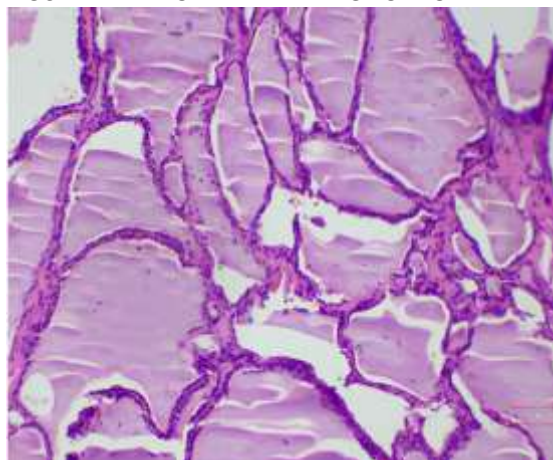


FIGURE 5. HPE IMAGE OF TOTAL THYROIDECTOMY

Discussion

A thyroglossal duct cyst cancer is an uncommon clinical condition that poses difficult diagnostic and therapeutic challenges. Clinically, malignant TGDCs are often indistinguishable from benign cysts. However, Certain characteristics should arouse caution, including firmness, fixation, Rapid enlargement, and the presence of a solid intracystic component with calcifications on imaging. Because the lesion is cystic, preoperative FNAC may help with diagnosis but has limited sensitivity. Cross-sectional imaging plays a crucial role in identifying suspicious features such as mural nodules and microcalcifications, which are characteristic of papillary carcinoma. The diagnosis of primary carcinoma originating in a TGDC requires the presence of carcinoma in the cyst wall, the absence of a primary thyroid malignancy, and the presence of thyroid tissue within the cyst or thyroglossal duct remnants inside the cyst. In this instance, these requirements were satisfied. There is ongoing debate on the scope of surgical management. Some authors recommend a complete thyroidectomy because of the possibility of synchronous or occult thyroid carcinoma and the multifocal character of papillary carcinoma, even if the Sistrunk approach would be sufficient for low-risk individuals with microscopic Disease limited to the cyst(3). Additionally, total thyroidectomy facilitates radioactive iodine therapy and postoperative surveillance using serum thyroglobulin

levels. Despite the lack of thyroid gland involvement on imaging and histopathology, a total thyroidectomy was carried out in this instance because of a preoperative cytological suspicion of cancer and to allow for efficient long-term follow-up(4)(5).

Conclusion

A rare illness with a good prognosis when treated properly is papillary carcinoma that grows in TGDC. As there is no accepted guidelines, management should be individualized according to Clinical, radiological, and pathological results. A thorough evaluation and a high index of suspicion are required to optimize outcomes while preventing overtreatment.

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