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Case Report

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A Unique Case of Concurrent, Multilocational Papillary Thyroid Cancer in Hyoid Bone: Case Report

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Papillary thyroid cancer (PTC) is the most common thyroid cancer, occurring in approximately 80% of cases with a peak incidence around age 30 to 50. PTC has a great prognosis with a 5-year survival rate approaching 99% when regionalized.[1,2]

Foregoing, we discuss the report of a 50-year-old male with synchronous papillary thyroid cancer with hyoid bone invasion and destruction. To our knowledge, involvement of the hyoid bone is extremely rare and has only been reported twice in English-language literature.[3,4]

Case Presentation

A 50-year-old male patient, with a history of heavy smoking, presented with a large neck mass. The physical examination revealed the mass was firm and fixed to the hyoid bone. The neck mass had been there for 4 months prior to the clinic visit and the patient reported increasing discomfort from the mass. A computed tomography (CT) scan was obtained and showed invasion and destruction of the mid-portion of the hyoid bone by the neck mass (**Figure 1A-C**). The mass was about 6 cm × 4 cm × 3 cm, centered above the midportion of the hyoid bone, with invasion to the deep base of tongue muscles, although no vallecula extension was noticed. Subsequently, a needle biopsy was performed on the neck mass and the pathology came back as papillary thyroid cancer. On the CT scan, the thyroid gland was in normal position, which led us to believe the neck mass was ectopic thyroid tissue. Importantly, there was no evidence on the CT scan or history of a thyroglossal duct cyst (TGDC). Thyroid function tests, such as serum thyroxine (T4), free triiodothyronine (T3), and thyroid stimulating hormone (TSH) were performed and results showed normal thyroid gland function.

Transcervical cancer resection was performed, along with a resection of a majority of the hyoid bone. During surgery, it's found the tumor had extensive surrounding invasion, but the invasion did give a relatively clear front edge to guide complete resection of the tumor. The tumor was close to the base of tongue mucosa, but it did not have any obvious direct mucosal involvement. The tumor was completely removed. Furthermore, a total thyroidectomy was performed due to the patient's indication for post-operative radioactive iodine treatment. No neck lymph nodes were found therefore, a neck dissection was not done.

The pathology came back as synchronous papillary thyroid cancer in both lobes of the thyroid gland and inside the hyoid bone, where the ectopic thyroid was located (**Figure 2**, Panel 1, A,B). The base of tongue mass was invasive papillary thyroid carcinoma with invasion of bone and skeletal muscle. Metastasis was identified in one of three regional lymph nodes with the resection. He underwent radioactive iodine treatment of 100 millicuries 4 weeks after surgical resection, due to the large extrathyroidal cancer tissue. He had a postoperative scan before the patient got radioactive iodine treatment, without showing any obvious residual thyroid gland tissue (**Figure 1**, Panel 2, A-D). During the following surveillance of post radioactive iodine treatment, with blood thyroglobulin level and TSH levels, the patient's thyroglobulin has been very low, less than 0.5 ng/mL, on every 3 month laboratory test results, and the level of antithyroglobulin antibodies has been less than 1 ng/mL.

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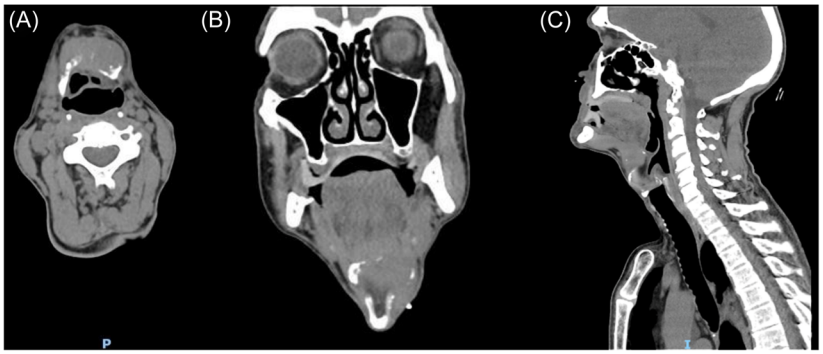

Figure 1. Preoperative computed tomography (CT) scan. (A) Axial view of the CT scan, showing extensive destruction of the hyoid bone by the mass, and the proximity of the mass to the vallecula. (B) On coronal view, the mass had extensive destruction and invasion to the surrounding tissue, including the hyoglossus muscle. (C) Sagittal view of the invasive mass shows the tumor had extension to the pre-epiglottic space by invading the posterior floor of the mouth.

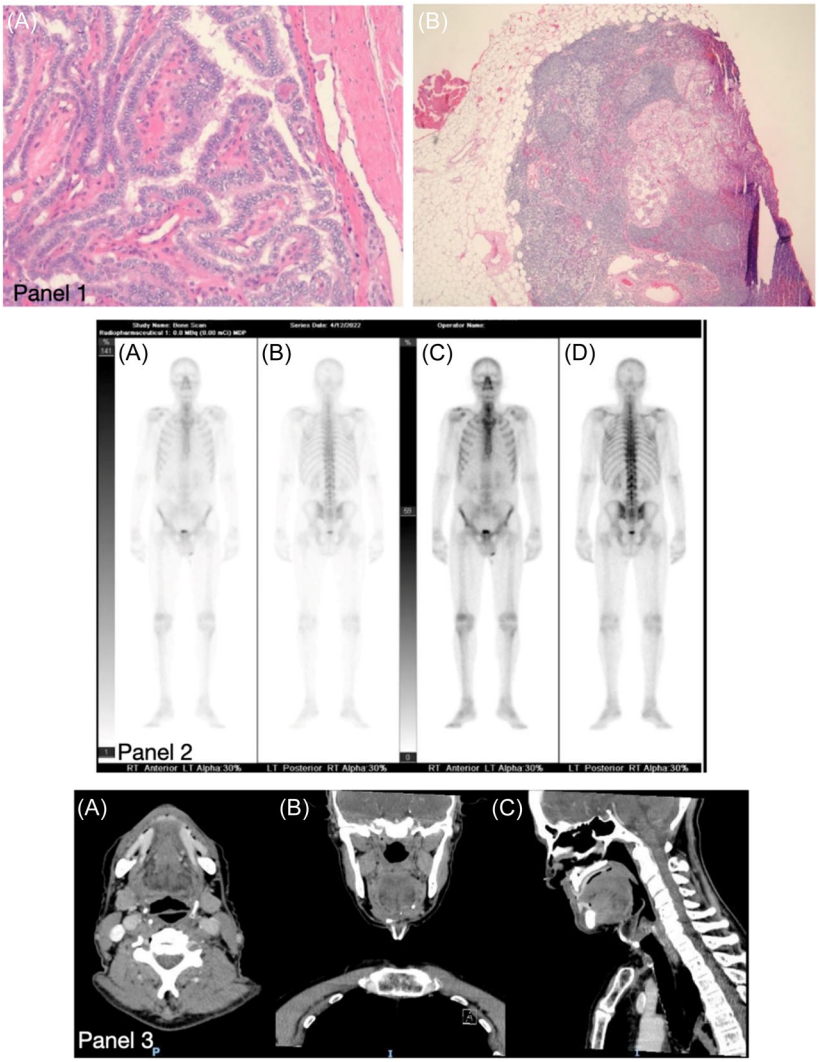

Figure 2. Panel 1: Pathology slides. (A) Pathology slide shows the structure of the tumor. (B) Pathology slide B consists of the tumor inside the lymph node. Panel 2: Postoperative nuclear medicine bone scan whole body for thyroid tissue (before radioactive iodine treatment). (A) Anterior view of the body before injection of radioactive iodine isotope. (B) Posterior view of the body before injection of radioactive iodine isotope. (C) Anterior view of the body after injection. (D) Posterior view of the body after injection. Panel 3: Surveillance computed tomography (CT) scan (18 months postoperative). (A) Axial view of the CT scan, showing extensive resection of the hyoid bone, without any residual tumor or mass. (B) On coronal view, there was no mass or lesion noticed either. (C) Sagittal view shows well-healed surgical area with clear anatomy of the pre-epiglottic space and well-healed base of tongue area.

Meanwhile, the patient's TSH level was kept below 0.1 mL U/L with levothyroxine replacement treatment. The patient was found to have no residual thyroid tissue after 18 months of surveillance (**Figure 1**, Panel 3, A-C).

Discussion

This is the first report of synchronous papillary thyroid cancer with an initial presentation as a base of tongue mass with invasion and destruction of the hyoid bone, and an additional involvement of both lobes of the thyroid. Hyoid bone invasion and destruction is uncommon for any thyroid cancer. Additionally, our patient did not have a history of TGDC, but did have ectopic thyroid tissue containing papillary thyroid cancer. Ectopic thyroid tissue is rare with a reported incidence of 1 in 300,000 and the probability of carcinoma in ectopic thyroid tissue is less than 1%.[5] Papillary thyroid cancer is often found in one lobe of the gland and about 10% to 20% of PTC appears in both lobes.[2] In our case, the patient had synchronous PTC in each lobe of the thyroid gland and the ectopic thyroid gland tissue at the base of tongue/hyoid area, making this case noteworthy.

Conclusion

We encountered a rare case of concurrent, multilocational papillary thyroid cancer with hyoid bone invasion and destruction. The initial presentation of the neck mass led to performing a fine needle aspiration confirming papillary thyroid cancer of the ectopic thyroid gland tissue. Furthermore, the CT scan showed the thyroid gland in normal position and hyoid bone invasion. The final pathology confirmed papillary thyroid cancer in each lobe of the thyroid gland and the ectopic thyroid gland tissue. We recommend surgical resection and postoperative radioactive iodine treatment. Additionally, we recommend life-long follow-up using image studies and blood thyroglobulin levels.

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None.

Author Contributions

Adam Schultz, wrote and revised the article; **Hanisha Bhakta**, BS, wrote and revised the article; **Changxing Liu**, designed, wrote, and revised the article. All authors read and approved the final manuscript.

Disclosures

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