

# Seattle Children's Thyroid Program

## Case Study: New Diagnosis of Metastatic Papillary Cancer in a 15-Year-Old

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**Summary:** A 15-year-old girl presented to her primary care provider with a one-month history of bilateral, painless neck masses. She was referred to the Seattle Children's Thyroid Program where she was diagnosed with metastatic papillary thyroid cancer and received state-of-the-art interdisciplinary care at the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) region's only high-volume pediatric thyroid center.



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**Patient History:** AB is a 15-year-old girl with no previous medical issues who presented to her primary care provider with a one-month history of a painless masses on both sides of her neck that were discovered during a routine school athletics physical. The primary care provider contacted the Seattle Children's Thyroid Program, where the nursing team recommended a thyroid ultrasound as well as measuring TSH and free T4 levels.

### Patient Diagnosis

AB's thyroid labs were normal, but the ultrasound was concerning for metastatic thyroid carcinoma. Her ultrasound and lab results were communicated to the Thyroid Program nursing team, and she was scheduled for an in-clinic, ultrasound-guided fine needle aspiration (FNA) biopsy to be performed by Dr. Scott Manning. FNA biopsies of the thyroid gland and bilateral enlarged cervical lymph nodes were completed in clinic under local anesthesia without any difficulty. Dr. Erin Rudzinski, a pediatric pathologist, was present to assist with the biopsy and confirmed there was an adequate specimen to make a cytopathologic diagnosis. The results from all biopsy sites came back showing a rare, diffuse sclerosing variant of papillary thyroid carcinoma.

### Imaging

Thyroid ultrasound demonstrated a 1.5-cm, solid, hypoechoic nodule in the right thyroid lobe with microcalcifications. Ultrasound mapping of her neck demonstrated bilateral enlarged cervical lymph nodes at all levels suspicious for metastasis. A chest CT was consistent with diffuse pulmonary metastasis.

### Treatment and Discussion

AB's findings were reviewed during a conference of the multidisciplinary Thyroid Program team, which included specialists from Pathology, Endocrinology, Radiology, Pediatric Hospitalist, Otolaryngology and Oncology. The group recommended surgery to be followed by radioactive iodine (RAI) treatment. AB underwent a total thyroidectomy and bilateral neck dissection by Dr. Scott Manning. After surgery, AB spent two days in the hospital under the care of Dr. Manning and Dr. Seth Adams, a pediatric hospitalist, for management of transient hypocalcemia per an evidence-based, standardized clinical pathway developed by the Thyroid Program at Seattle Children's Hospital.

AB underwent RAI treatment again two months after surgery under the direction of Dr. Margaret Parisi, a pediatric radiologist with expertise in nuclear medicine. Unfortunately, post-RAI imaging demonstrated further growth of her

pulmonary metastasis. The Oncology service led by Dr. Douglas Hawkins then ordered Oncoplex genetic analysis of the original tumor, which demonstrated an ALK-STRN fusion. After further progression of her pulmonary metastasis, AB was started on crizotinib, a protein kinase inhibitor approved for ALK-positive tumors. After starting this therapy, AB's lung metastases stabilized.

*Discussion:* Papillary thyroid carcinoma is rare in the pediatric age range, with fewer than 400 cases per year reported in the United States in patients ages 18 and under. Seattle Children's Hospital has a wide referral area (WWAMI region) and a patient age range up to 21 years, so we see a relatively large share of the national experience. This case is particularly complex, but it illustrates the value of our multidisciplinary team providing comprehensive care for our Thyroid Program patients. This case also illustrates the new frontier of matching tumor-specific genetic changes with an ever-increasing palette of targeted drug therapies.

## **Outcome**

AB did well after recovering from surgery and RAI treatment. She is tolerating medical therapy, and her lung metastases are stable. She will continue to have close clinical follow-up with the Seattle Children's Thyroid Program.

## **References**

1. Pillai S et al. Diffuse sclerosing variant of papillary carcinoma. *Crit Rev Oncol Hematol* 2015;94:64-73.
2. Dima M et al. Molecular profiles of cancer stem-like populations in aggressive thyroid cancers. *Endocrine* 2016; 53:145-56.