

Minocycline and Black Thyroid: Should Patients with Acne Be Screened for Cancer?



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INTRODUCTION

- Black thyroid is a rare condition associated with minocycline use and remains a challenge to diagnose.
- This dark pigmentation of the thyroid is not revealed via fine-needle aspiration and cytology (FNAC) but is only discovered on gross examination post-thyroidectomy.
- There has been a reported association between black thyroid and thyroid cancer.

GROSS EXAMINATION



Figure 1: Gross image of thyroid gland with papillary thyroid cancer (arrow) surrounded by dark pigmentation of a patient with black thyroid.

HOSPITAL COURSE

- A young male with a past medical history of acne and hypertension was found to have an incidental thyroid nodule discovered during an ultrasound demonstration for a healthcare class. TSH level was 2.0 uIU/mL, and dedicated thyroid ultrasound showed multiple bilateral nodules and a cystic nodule in the right mid jugular chain lymph node. He denied a history of radiation, family or personal history of thyroid cancer, infections, dysphagia, or hoarseness.
- Physical examination was negative for proptosis, lid lag, periorbital edema, thyromegaly, palpable nodules, bruits, tremors, or hyperreflexia. The patient underwent FNAC and was found to have a classic variant subtype of papillary thyroid carcinoma with metastases to the lateral neck lymph node. Due to coincidental hypertension, pheochromocytoma was ruled out.
- He underwent total thyroidectomy with bilateral central neck lymph node dissection as well as right modified radical neck dissection. On gross examination, dark brown pigmentation was diffusely present within the thyroid parenchyma as shown in Figure 1. A similar pigment was seen on dissected metastatic lymph nodes. On microscopic examination, there was prominent dark brown pigment deposition in follicular cells, colloid, and macrophages.
- Further history revealed chronic minocycline use for acne treatment. Based on the history of minocycline therapy along with gross and microscopic findings of hyperpigmentation seen on the thyroid, a diagnosis of black thyroid was made.

DISCUSSION

- Minocycline, a member of the tetracycline antibiotic family, is commonly used as a treatment for severe acne. Minocycline induced black thyroid was first discovered in 1976.
- While the exact mechanism is not well understood, the most precise explanation thus far is related to the oxidation interaction between thyroid peroxidase and minocycline.
- Case series suggest an association between nodules in those with black thyroid and thyroid carcinoma with cancer rates of 66% in a series of 63 nodules and 0% in a series of 7. Of 925 patients who underwent thyroidectomy, a higher incidence of malignancy was found to be in patients with black thyroid glands (55.4%) as compared to non-black thyroid glands (32.8%) ($p < 0.0001$).
- As demonstrated in our case and with supporting data towards an association between thyroid cancer and minocycline use, clinicians should remain wary when patients are treated with minocycline.

REFERENCES.

1. Bann, Darrin V, et al. "Black Thyroid." Ear, Nose & Throat Journal, U.S. National Library of Medicine, 2014, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4345646/>
2. Ibrahim, Yasin, et al. "Thyroid Cancer in Black Thyroid Glands: the Effect of Age and Race." ORL; Journal for Oto-Rhino-Laryngology and Its Related Specialties, U.S. National Library of Medicine, 2015, www.ncbi.nlm.nih.gov/pubmed/25661419