

# Black Thyroid Syndrome

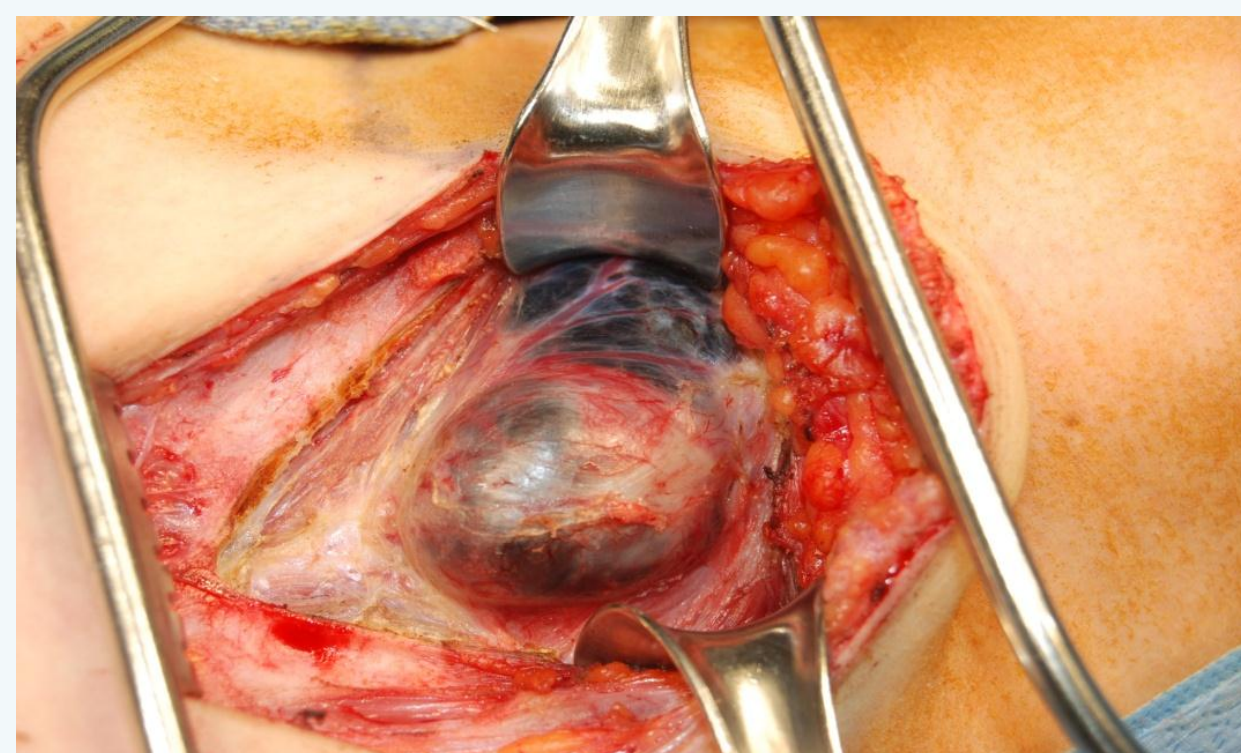
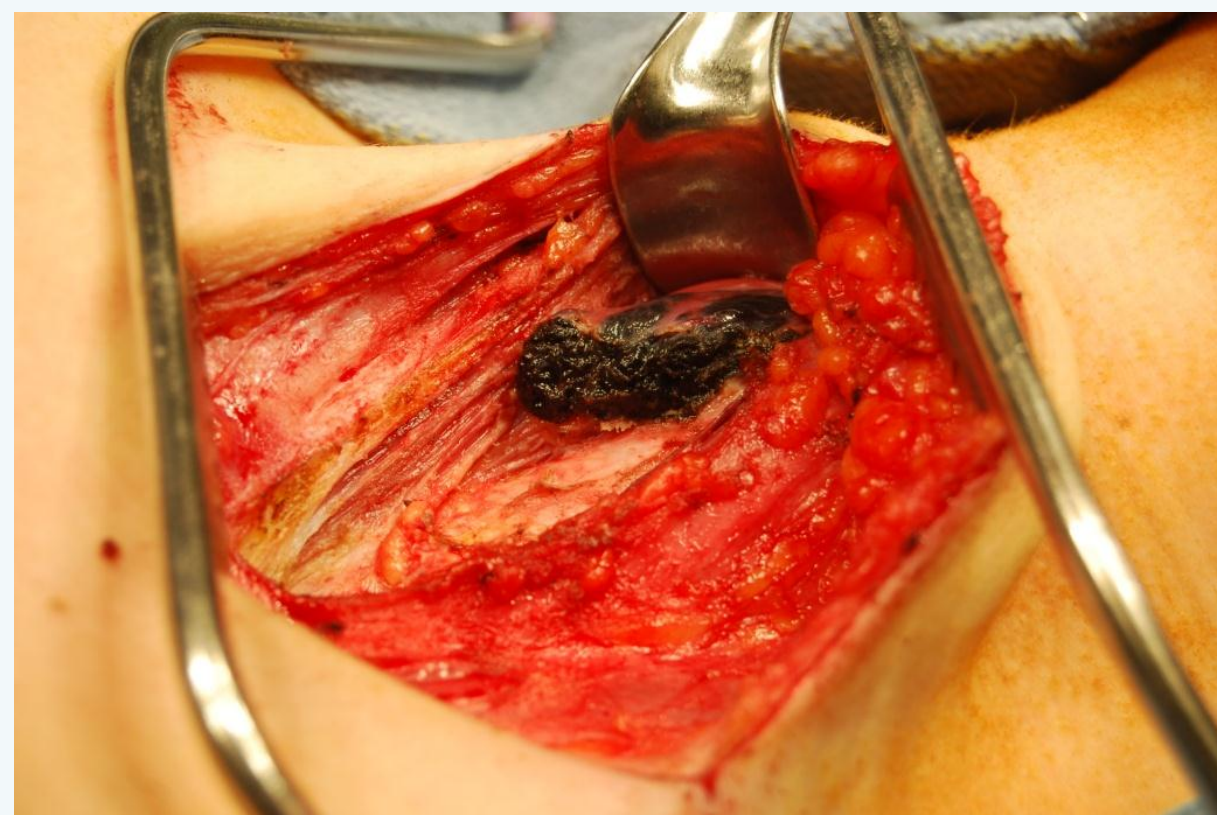
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## Introduction

Black thyroid is a rare phenomenon of pigmented change in the thyroid associated with the use of the antibiotic minocycline. The dark pigmentation noted in the thyroid is the result of an oxidation interaction between the enzyme thyroid peroxidase and the drug.<sup>1</sup> Black thyroid related to the use of minocycline is typically described as a benign condition.

**Case 1.** A 17-year-old female presented in January 2012 with a palpable thyroid which was found to be a mixed solid cystic nodule in the left thyroid bed. On exposure of the right thyroid lobe intra-operatively, the thyroid gland appeared to be black in color. Histopathology of the specimen revealed a cystic adenomatoid nodule with pigment deposition that was negative for malignancy. There was fine granular pigment found in the cytoplasm of the epithelium as well as in the colloid of follicles, stroma, and in macrophages consistent with black thyroid.

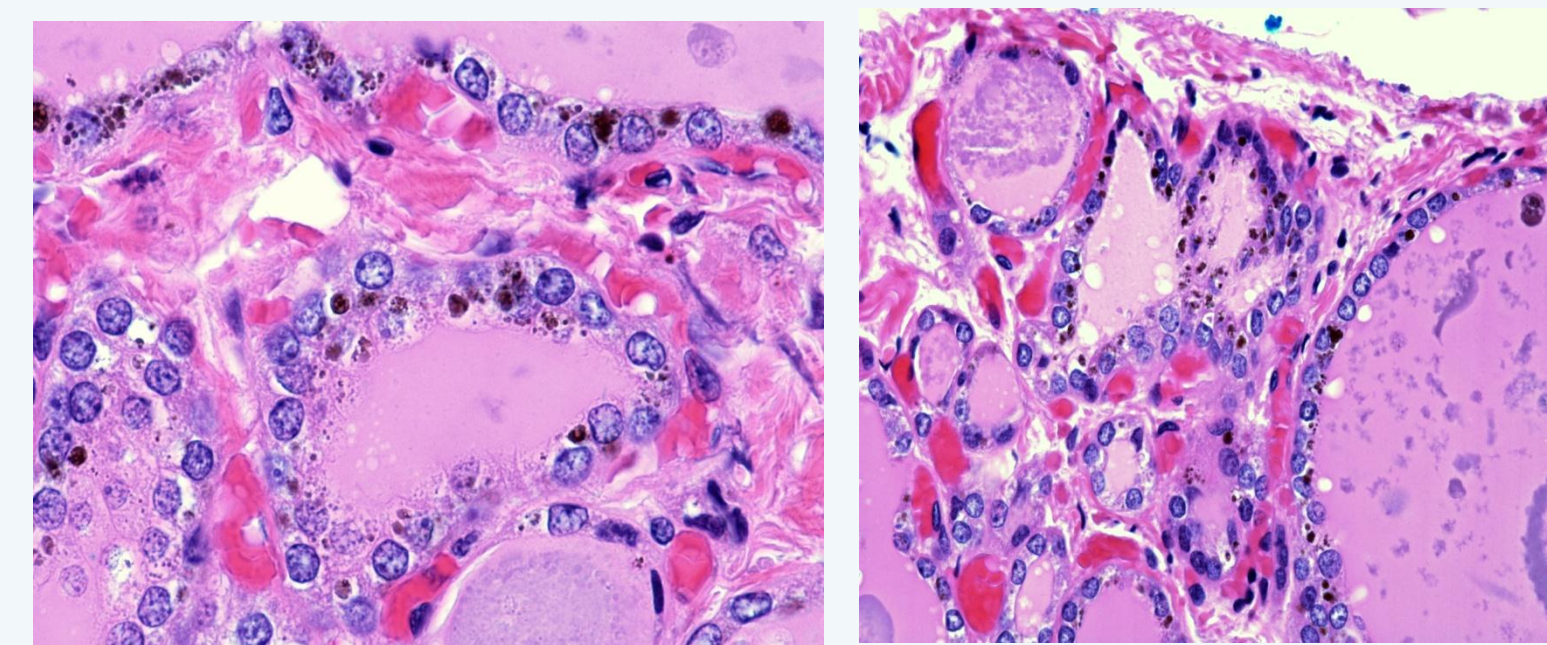


Figures 1 and 2: Intraoperative view of pigmented thyroid

**Case 2.** A 32-year-old female initially presented with complaints of a mass and tenderness over the left aspect of her neck. An ultrasound and FNA revealed papillary thyroid cancer. Intraoperative findings showed a large hard nodule and a surrounding deep black pigmented thyroid parenchyma. The histopathology report showed a papillary thyroid carcinoma and melanosis thyroidei of the surrounding parenchyma. Of note, the papillary thyroid carcinoma was the only area of the specimen lacking the black pigment



Figures 3 and 4: Gross specimen of thyroid gland revealing darkened pigment – not non pigmented tumor



Figures 5 and 6: H&E Stain- The thyroid follicular cells can be seen to contain granular cytoplasmic brown pigmentation.

**Case 3.** A 64-year-old woman was referred for primary hyperparathyroidism in 2011. At the time of presentation she was taking minocycline for acne. In May 2011, she underwent a parathyroidectomy on the right. During the course of surgery the thyroid gland was noted to be jet black in color.

## Discussion

Each patient who presented with a pigmented thyroid showed evidence of current or recent minocycline use over a prolonged period of time. Gross discoloration of the thyroid gland can occur in disorders such as hemorrhage, mucoviscidosis, hemochromatosis, cystic fibrosis, chronic obstructive pulmonary disease, and chronic minocycline use.<sup>2,3</sup> Minocycline is a long-acting tetracycline that is a broad-spectrum antibiotic used for Gram-positive infections and acne vulgaris.<sup>3</sup> This drug is noted to cause hyperpigmentation in organs including nails, bones, skin, oral mucosa, sclera, heart valves, and thyroid gland.<sup>2</sup>

In the thyroid, minocycline has been proposed to react with thyroid peroxidase in an oxidation reaction and is degraded to a black, in-soluble, non-fluorescent pigment that accumulates in the follicular epithelium and colloid.<sup>4</sup>

While it is usually considered a harmless phenomenon, some reports have suggested the association of black thyroid and carcinoma but no definitive connection has yet been made.<sup>1</sup> Reviewing the histopathology In the cases presented, the hyperpigmentation was not present in the cancerous tissue presented in Case 2 and was found to be a benign finding in Case 1 and 3. This leads us to consider the possibility that minocycline only deposits in tissue where thyroid peroxidase is active such as normal thyroid tissue and not in cancerous tissue.

## Conclusion

When encountering a “black thyroid,” it is important to consider a history of minocycline use. Additionally, information on histopathology regarding granular pigmentation can confirm this etiology.

## References

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