Unilateral Hurthle Cell Carcinoma Presenting as Solitary Nodule with Referred Shoulder Pain

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Introduction

- Hurthle cell carcinoma (HCC) is a rare, well-differentiated thyroid tumor that accounts for 3% of all thyroid tumors.[1]
- Common presentation of HCC includes a localized primary thyroid tumor ranging from 1-4 cm in size.[2]
- Table 1 contains physical properties and symptoms associated with invasive HCC[3-5]
- The large majority of patients with HCC are euthyroid at diagnosis[6]
- Incidence for HCC is higher amongst females with malignant Hurthle cell types having a higher affinity for adult women over 50 years of age.[3,7,8]
- Factors influencing HCC malignant potential include tumors larger than 5 cm and 75% oxyphilic cell cytology with a high degree of atypia.[3,9]
- Compared to follicular and papillary thyroid cancers, HCC is more aggressive with a tendency to spread to distant sites resulting in a higher rate of mortality.[10]
- Although the majority of HCC is localized, there is the potential for extrathyroidal metastasis to the cervical lymph nodes in 37% of HCC according to one study.[2,11]
- Hurthle cells are characterized by an abundance of granular, eosinophilic cytoplasm with a prominent nucleolus and hyperchromatic nucleus.[5]
- Considered a variant of follicular histology, 20% of patients with HCC have concurrent papillary thyroid carcinoma.[2,6]
- Unlike follicular thyroid cancers, most HCC does not uptake radioiodine (~90%) whereas almost 75% of follicular thyroid carcinoma is responsive to radioiodine uptake.[10]
- Diagnosis of HCC is largely based on histological analysis of thyroid nodule fine needle aspirate as well as the presence of vascular or capsular invasion.[5,10]
- Notable prognostic factors include male gender, extrathyroidal invasion and metastases, and the extent of dissection and removal of thyroid and lymphatic nodules.[6]
- One study detected no clinically significant difference in survival with partial or total thyroidectomy.[8]

Table 1. Physical presentation of invasive HCC[3-5]

Tumor > 1.5 cm	Hoarseness
Hard, immobile nodule/mass	Dysphagia
Cervical lymphadenectasis	Dyspnea

Case Description

History

- 49-year-old male presented for routine physical examination complaining of intermittent numbness and ache over left clavicle for 6 months that was exacerbated when seated for an extended period of time.
- He reported a sensation lasting 5-10 minutes as well as a similar sensation occurring in the back of the neck when flexed for long periods of time.
- No past medical or surgical history.
- Social history significant for alcohol use of 3 standard drinks per week.
- Review of systems positive for fatigue and negative for fever, chills, or unintentional weight loss.
- No known allergies to medications.
- Family history
  - Father—Cholangiocarcinoma
  - Mother—Leukemia, melanoma

Differential Diagnosis

- Papillary thyroid carcinoma
- Follicular thyroid carcinoma
- Thyrotoxicosis
- Colloid cyst
- Medullary thyroid carcinoma
- Hurthle cell carcinoma
- Metastatic tumors to the thyroid

Physical Exam

- Vitals in primary care office:
  - Temperature: 97.9°F
  - Pulse: 59 bpm
  - Blood pressure: 102/64 mmHg
  - Respiratory rate: 14 bpm
  - Oxygen saturation: 99% on room air
- Oriented to person, place, and time.
- Normal cardiac rate and rhythm with clear S1 and S2
- Lungs clear to auscultation in anterior and posterior fields
- Abdomen soft, non-tender, and non-distended
- Left clavicle non-tender to palpation
- Full ROM and 5/5 strength of the neck and bilateral shoulders
- Mobile, soft, right-sided thyroid nodule on palpation
- No palpable cervical lymphadenopathy
- No erythema, ecchymoses, or bony deformities over left clavicular region
- CNXI intact
- Remainder of the physical examination was unremarkable.

Diagnostic Results

- Thyroid ultrasound showed a 3.8 cm mixed echotexture, predominately solid, right-sided peripherally vascular thyroid nodule.
- Figure 1 shows Hurthle cell histological features present on microscopy from fine needle aspiration (FNA). Moderate cellularity of cells is present with microfollicles and loosely cohesive groups.
- Figure 2 shows capsular invasion by Hurthle cells on thyroid nodule biopsy. Invasion indicates malignancy and distinguishes the nodule as a Hurthle cell carcinoma opposed to an adenoma.
- Lab work included a CBC, CMP, lipid panel, and thyroid panel including TSH, free T3, free/total T4, thyroglobulin, and thyroglobulin antibodies.

Lab values:

- White blood cell count 3.7 x 10^9/L
- TSH 2.8 mIU/L
- Free T3 2.6 pg/mL
- Free T4 1.4 ng/dL
- Total T4 7.5 mcg/dL
- Thyroglobulin 51 ng/mL
- Thyroglobulin Antibody (TgAb) 2.2 IU/mL

- No evidence of regional metastasis to cervical lymph nodes or distant metastases on CT.

Figure 1. FNA Hurthle cell cytology[5]

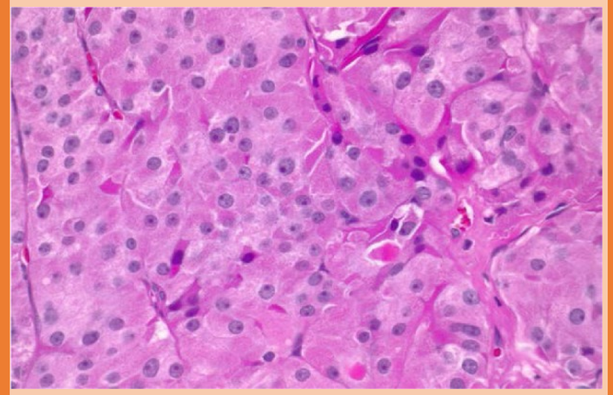
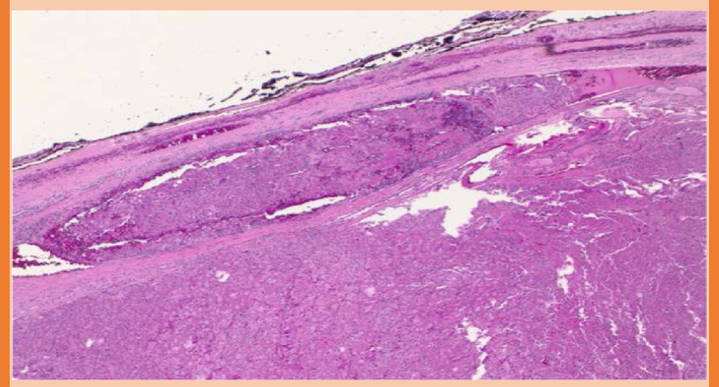


Figure 2. Tissue biopsy Hurthle cell cytology[5]



Discussion

Patient followed up via telemedicine visit 3 weeks following his initial visit. He was referred to ENT for evaluation for thyroid lobectomy.

Surgery was performed and 3.8 cm thyroid tumor localized to the right lobe was excised with the removal of the right thyroid lobe. Pathology had later confirmed the presence of Hurthle cell neoplasm contained in the sample with clear margins.

The clinical presentation of Hurthle cell carcinoma is commonly unilateral with the possibility for regional or distant metastasis evident at the time of diagnosis.[7,10]

This case of a solitary, painless, localized thyroid nodule is the typical presentation for 20-30% of malignant thyroid carcinomas.[5]

Recommended Treatment

The clinical course is similar to that of follicular thyroid carcinomas with the initial surgical treatment intervention considered lobectomy with or without isthmusectomy for localized tumors or total thyroidectomy.[7]

Case Outcome

Since the removal of the right thyroid lobe, left-sided supraclavicular numbness and similar neck sensation has subsided. Patient has been sent for repeat blood work to examine any subsequent thyroid hormone abnormalities warranting medical supplementation.

Conclusion

- Hurthle cell carcinoma is a rare thyroid malignancy that can easily be mistaken for other follicular or papillary thyroid carcinoma variants due to similar clinical and cytological presentation.
- Hurthle cell carcinoma is difficult to detect whether patient presentation is consistent with the literature or if any deviation exists.
- There is still a lot to be learned in regards to Hurthle cell carcinoma and how to efficiently and accurately differentiate this cell type in a clinical setting.
- It is essential for patients with a goiter suspicious for thyroid nodules to be evaluated for thyroid malignancy and metastasis in order to prevent missed diagnoses and delay necessary treatments.

References

1. Gopal RJ, Sadow PM, Ganly I. (2021) 25-Hurthle cell tumors of the thyroid. In: Randolph GW. (Eds) Surgery of the thyroid and parathyroid glands. Elsevier, Inc. Doi: 10.1016/C2015-0-00907-8
2. Stojadinovic A, Hoos A, Ghossein RA, et al. Hurthle cell carcinoma: a 60-year experience. *Ann Surg Oncol.* 2002; 9(2): 197-203. URL: https://link.springer.com/content/pdf/10.1007/BF02557374.pdf
3. Johnson TL, Lloyd RV, Burney RE, and Thompson NW. Hurthle cell thyroid tumors: an immunochemical study. Cancer. 1987; 59: 107-112. Doi: 10.1002/1097-0142(19870101)59:1<107::AID-CNCR2820590123>3.0.CO;2-U
4. Gigliotti B, Parangi S. (2017) Clinical presentation and diagnosis of hürthle cell thyroid cancer. In: Mancino A, Kim L. (eds) Management of differentiated thyroid cancer. Springer, Cham. Doi: 10.1007/978-3-319-54493-9_8
5. Ahmadi S, Stang M, Jiang X, and Sosa JA. Hurthle cell carcinoma: current perspectives. *Onco Targets Ther.* 2016; 9: 6873-6884. Doi: 10.2147/OTT.S119980
6. Kushchayeva Y, Duh QY, Kebebew E, D'Avanzo A, and Clark OH. Comparison of clinical characteristics at diagnosis and during follow-up in 118 patients with Hurthle cell or follicular thyroid cancer. *Am J Surg.* 2008; 195: 457-462. Doi: 10.1016/j.amjsurg.2007.06.001
7. Tollefsen HR, Shah JP, and Huvos AG. Hurthle cell carcinoma of the thyroid. Am J Surg. 1975; 130(4): 390-394. Doi: 10.1016/0002-9610(75)90470-5
8. Zhou X, Zheng Z, Chen C, et al. Clinical characteristics and prognostic factors of hurthle cell carcinoma: a population based study. BMC Cancer. 2020; 20: 407. Doi: 10.1186/s12885-020-06915-0
9. Pisanu A, Sias L, and Uccheddu A. Factors predicting malignancy of hurthle cell tumors of the thyroid: influence on surgical treatment. *World J Surg.* 2004; 28: 761-765. Doi: 10.1007/s00268-004-7312-9
10. Yutan E, and Clark OH. Hurthle cell carcinoma. *Curr Teart Options Oncol.* 2001; 2:331-335. URL: https://link.springer.com/content/pdf/10.1007/s11864-001-0026-4.pdf
11. Stojadinovic A, Ghossein RA, Hoos A, et al. Hurthle cell carcinoma: a critical histopathologic appraisal. *J Clin Onc.* 2001; 19(10): 2616-2625. Doi: 10.1200/JCO.2001.19.10.2616