Thyroid abscess following fine needle aspiration in an immunocompetent, pregnant patient: A case report and literature review

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Figure 1. Right neck mass

Patient History

34 year old pregnant (12 weeks 2 days), female patient who presented to clinic with an enlarging right neck mass.

- Noticed a non-tender right neck mass in January 2023 (Figure 1)
- Ultrasound (2/2023) showed a 4.8cm nodule (TR3) on the right and a 1.5cm (TR4) nodule on the left
- US guided needle fine needle aspiration (FNA) on 3/17/2023 of right and left nodules
  - The patient reports that she was "stuck literally 100 times"
- Worsening neck swelling, pain, difficulty lifting right arm over the next 2 months. Mass became firm and more tender.
- Intermittent voice changes
- Presented to otolaryngology clinic on 5/13/2023 for right thyroid nodule FNA findings "suspicious for papillary carcinoma, Bethesda class V"

Review of Systems: Denies otalgia, dysphagia, odynophagia, sore throat, breathing difficulty
Past Medical History: Anxiety, asthma
Obstetric History: 8 pregnancies of which 3 have been carried to viability
Past Surgical History: 3 cesarean sections
Allergies: None
Medications: Hydrocodone-acetaminophen, meloxicam, topiramate, ubrogepant
Family history: No family history of thyroid disease, mother has systemic lupus erythematosus

Investigation

Physical Exam:
- Warm, firm approximately 10cm right-sided lower neck mass with overlying erythema. Thyroid tender to palpation and diffusely enlarged. Decreased neck range of motion.
- Flexible laryngoscopy normal with mobile cords (Figure 3).

Labs:
- TSH 0.47 (normal 0.3-4.0), T4 0.86 (normal 0.9-1.7)
- ESR 70 (normal 0-20); CRP elevated to 121 (normal <5)
- WBC 12.3 with leftward shift
- Thyroid antibodies normal

Imaging:
Ultrasound 5/13/2023: "Large complex collection identified in the right neck with surrounding vascularity and prominent regional lymph nodes. Cannot exclude abscess."

Management and Findings

Given early pregnancy and enlarging neck mass with overlying cellulitis, recommendation was made for inpatient admission to continue the work-up and management. Based on the ultrasound findings and labs suggestive of acute infection, the decision was made to perform an incision and drainage (I&D) in the operating room under sedation and a regional block.

Incision and drainage 5/13/2023:
- The fluid collection was identified with ultrasound and 7cc of mucopurulent fluid was aspirated for culture
- A 3cm incision was made and a necrotic phlegmon was identified between the great vessels and the right thyroid. Specimens were collected for pathology
- 15 Fr Blake drain was placed adjacent to the incision

Pathology:
"Abundant acute, chronic, and histiocytic inflammation involving fibrous tissue and skeletal muscle. AFB, GMS, and keratin stains are negative. There is no evidence of malignancy. " (Figure 2)

Microbiology:
- Cultures from the operating room grew cutibacterium acnes (formerly Propionibacterium acnes)

Follow-up ultrasound on 5/17/2023 showed decreased edema and no clear collection as seen previously. She was treated with 4 weeks of Augmentin with marked improvement in the size, appearance and tenderness of the right lower neck at post-operative follow up on 5/26/2023. She was then lost to follow up.

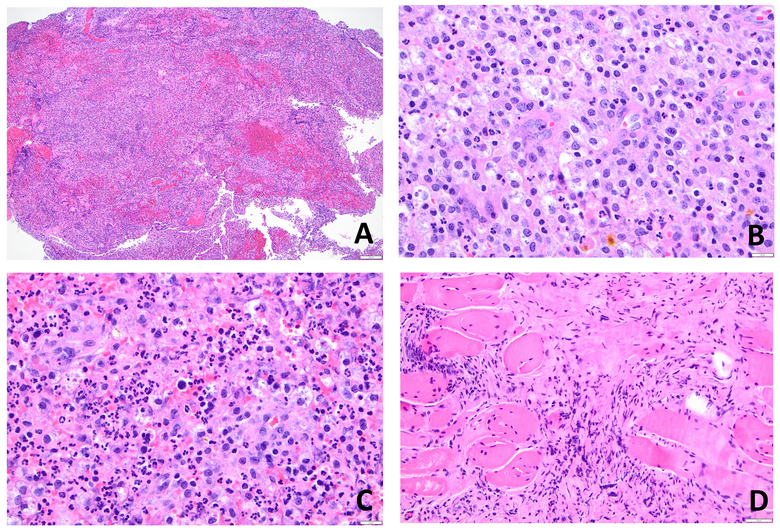

Figure 2: A: Low power inflammation and fibrosis; B: Neutrophils and macrophages; C: Neutrophils; D: Skeletal muscle with surrounding inflammation and fibrosis

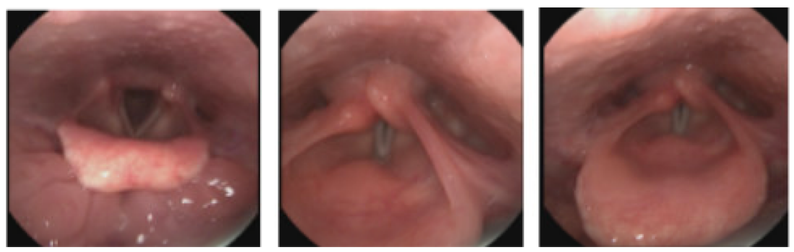

Figure 3. Images from flexible laryngoscopy

Literature Review

Search strategy and search terms:
Database: PubMed
Filter: Case Report
Search Terms: (((FNA) OR (fine needle aspiration)) AND (thyroid)) AND (abscess)

A literature review was performed using the above search strategy. The search yielded 66 reports, of which 11 were selected for inclusion in this study. An additional 4 relevant reports were identified and included by reviewing the references of our papers. A previous literature review was performed by Htet et al. in 2020 [4] which included all but 4 of the identified reports in this study. The key findings of the 4 studies not previously reported on are presented in Table 1.

Author	Year	Causal organism	Length of time from FNA to presentation	Management
Gautam et al. [1]	2024	Coryne-bacterium	10 days	IR guided drainage of thyroid abscess, broad spectrum IV antibiotics followed by organism-specific antibiotics
Das et al. [2]	2023	Sterile	2 weeks	I&D under general anesthesia with drain placement. Discharged on post-operative day 5. Antibiotics for 1 week post-discharge
Purdy et al. [5]	2021	Multiple Staph species; Propioni-bacterium acnes	4 weeks	Planned for thyroid lobectomy but converted to I&D of abscess and subtotal thyroidectomy. Prescribed 2 week course of Augmentin.
Park et al. [6]	2018	Not performed	4 weeks	FNA decompression of abscess and oral cefexime for 6 weeks

Conclusion

Fine needle aspiration is a common procedure that is widely considered safe with minimal complications. In this case report, we describe an indolent infection that presented 2 months following FNA. Other than pregnancy, this patient had no significant medical comorbidities and she was not immunocompromised. This case report was also unique in that it relied on ultrasound for imaging given the patient's early pregnancy. Though infection following FNA is rare, it is a known complication and should be considered even in immunocompetent patients presenting several months after FNA.

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