A Case of Granulomatous Thyroiditis with concurrent Multinodular Goitre and Tuberculous infection

[1]Kiran Prasad Moparthi, [2]Meghana Reddy Muddam, [3]T Nihal Muniah, [4]Medhasa Gillela, [5]Nalla Pratyusha

[1]MBBS, [2]MBBS, [3]MBBS, [4]MBBS, [5]MBBS
[1]Internal Medicine,
[1]SVS Medical College, India

Abstract— **Granulomatous thyroiditis, also known as subacute or de Quervain's thyroiditis, is a rare inflammatory disorder of the thyroid gland. It is often characterized by a painful enlargement of the thyroid and may present with symptoms mimicking hyperthyroidism. A 76-year-old female presented with a long-standing history of thyroid nodules and clavicular pain. The patient also reported a right neck mass, primary thyroid cancer, stomach issues, and nausea. Physical examination revealed the presence of a right neck mass, but no other significant symptoms such as diarrhea, voice changes, or weight loss were observed. The patient had a history of essential hypertension, hyperthyroidism, GERD, multinodular goiter, and osteoporosis. Ultrasound results showed nodules in the thyroid isthmus and left upper region, both of which were reported as benign on fine needle aspiration (FNA). The thyroid profile revealed hyperthyroidism. A microscopic examination of the thyroid gland revealed granulomatous thyroiditis with acid-fast bacteria identified. Subsequent molecular testing confirmed the presence of Mycobacterium tuberculosis complex organisms through PCR.**

***Index Terms*— Granulomatous thyroiditis, hyperthyroidism, 76-year-old female, thyroid nodules, Mycobacterium tuberculosis.**

I. INTRODUCTION

Granulomatous thyroiditis, also known as subacute or de Quervain's thyroiditis, is a rare inflammatory disorder of the thyroid gland. It is often characterized by a painful enlargement of the thyroid and may present with symptoms mimicking hyperthyroidism.[8] Tuberculous thyroiditis is an unusual presentation of extrapulmonary tuberculosis, and its coexistence with multinodular goiter poses diagnostic challenges. We describe a case of granulomatous thyroiditis with concurrent multinodular goiter and a tuberculous infection. The thyroid disorders have been an area of considerable interest and concern in the field of endocrinology and medicine at large.[9] Among the myriad conditions that can afflict the thyroid gland, granulomatous thyroiditis stands out as a rare and intriguing entity.[10] Granulomatous thyroiditis is characterized by the formation of granulomas in the thyroid tissue, often leading to inflammation and swelling of the gland. This condition, while uncommon, presents a unique challenge to clinicians due to its diverse etiology and clinical manifestations. [2]

In recent years, there has been a growing body of evidence suggesting potential links between thyroid disorders and infectious diseases. One such striking association has emerged in cases where granulomatous thyroiditis coexists with other thyroid pathologies, such as multinodular goiter, in conjunction with an underlying tuberculous infection.[2] This study delves into the captivating case of a patient diagnosed with granulomatous thyroiditis, who concurrently presented with a multinodular goiter and a tuberculous infection. The aim of this study is to shed light on the intricate interplay between these three distinct pathological entities and their implications for the patient's clinical course, diagnosis, and management. Additionally, it seeks to contribute to the limited pool of knowledge surrounding this rare clinical scenario, enhancing our understanding of the potential associations between thyroiditis, multinodular goiter, and tuberculosis.

To comprehensively explore this unique case, we review the patient's medical history, clinical presentation, laboratory findings, imaging studies, and histopathological analysis. We also analyze the challenges faced by the healthcare team in establishing an accurate diagnosis and devising an optimal treatment plan to address the concurrent pathologies. This investigation may provide valuable insights into the underlying mechanisms that could foster the development of such a complex clinical presentation and encourage clinicians to consider the possibility of a granulomatous thyroiditis-tuberculosis nexus in cases with similar atypical features.

II. Case Presentation

A 76-year-old female presented with a history of thyroid nodules dating back over 40 years, which were first discovered during her first pregnancy. The patient reported clavicular pain, a right neck mass, burning sensation of stomach and nausea. There were no complaints of diarrhea, voice change, or weight loss. The patient had a medical history of essential hypertension, hyperthyroidism, GERD, multinodular goiter, and osteoporosis and primary thyroid cancer. The Physical examination revealed a palpable firm mass on the right side of the neck, corresponding to the location of the reported neck swelling. No signs of inflammation were observed and the mass moved with deglutition. The patient's thyroid profile indicated hyperthyroidism. The ultrasound of the neck revealed nodular lesions involving the isthmus (measuring 1.8 cm) and the left upper region (measuring 1.4 cm). Fine needle aspiration (FNA) of these nodules showed benign findings. A thyroidectomy was performed, and a histopathological examination of the thyroid gland revealed granulomatous thyroiditis with areas of caseation necrosis. Ziehl-Neelsen staining demonstrated the presence of rare acid-fast bacteria, indicative of tuberculous infection. To confirm the diagnosis of tuberculous thyroiditis, molecular testing using PCR was conducted, which detected Mycobacterium tuberculosis complex organisms. This case highlights the importance of considering granulomatous thyroiditis in the differential diagnosis of neck masses

and hyperthyroidism-like symptoms. Furthermore, it underscores the significance of molecular testing in detecting rare infections like tuberculous thyroiditis in the presence of multinodular goiter. Early diagnosis and appropriate management of such cases are crucial for better patient outcomes.

III. Discussion

The presented case is an intriguing instance of a 76-year-old female with a longstanding history of thyroid nodules, dating back over four decades. Despite the presence of nodules, she had remained largely asymptomatic until recent complaints of clavicular pain and the discovery of a palpable firm mass on the right side of her neck. This mass was found to move with deglutition, indicating its association with the thyroid gland. The patient's medical history revealed an array of pre-existing conditions, including essential hypertension, hyperthyroidism, GERD, multinodular goiter, and osteoporosis.

The patient's clinical presentation and the coexistence of multinodular goiter, thyroid cancer, and hyperthyroidism, it was imperative to rule out various differential diagnoses. The physical examination and ultrasound findings led to the performance of fine needle aspiration (FNA) of the nodules. Fortunately, the FNA results indicated benign findings, but this warranted further investigation. A thyroidectomy was conducted to gain a more comprehensive understanding of the underlying pathology. The histopathological examination of the thyroid gland revealed granulomatous thyroiditis with areas of caseation necrosis. The presence of caseation necrosis raised concerns about potential infectious etiologies, prompting the use of Ziehl-Neelsen staining to investigate the presence of acid-fast bacteria.[6] The rare detection of acid-fast bacteria suggested the possibility of tuberculous infection. To confirm this suspicion, molecular testing using PCR was performed, and it successfully identified the presence of Mycobacterium tuberculosis complex organisms.

This case serves as a significant reminder of the importance of considering granulomatous thyroiditis in the differential diagnosis of neck masses and hyperthyroidism-like symptoms. Despite being a rare condition, tuberculosis of the thyroid should not be overlooked, especially in the context of multinodular goiter. Early and accurate diagnosis is crucial for initiating appropriate management and ensuring favorable patient outcomes. The rarity of tuberculous thyroiditis highlights the challenges that clinicians may encounter when dealing with atypical thyroid pathologies. Additionally, the presence of caveating granulomas and acid-fast bacteria in histological examinations can assist in distinguishing tuberculous thyroiditis from other granulomatous thyroid diseases. Molecular testing, such as PCR, plays a crucial role in confirming the diagnosis, especially when conventional staining methods are inconclusive. This case report underscores the importance of considering a broad differential diagnosis and the need for a multidisciplinary approach in tackling complex and atypical presentations of thyroid disorders. Ultimately, our findings may pave the way for further research in this domain and inform improved patient care strategies for similar challenging clinical encounters.

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