Uncommon cystic presentation of a common cervical mass

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European Journal of Medical Case Reports
Volume 8(2):33–36
DOI: 10.24911/ejmcr.173-1704652051

ABSTRACT

Background: Parathyroid cysts (PCs) are rare, constituting less than 0.5% of parathyroid lesions. PCs are often asymptomatic or present with non-specific symptoms, posing challenges for accurate diagnosis.

Case Presentation: We report a case of a 22-year-old female presenting a painless, growing left-sided neck mass. Imaging, including contrast-enhanced neck computed tomography, magnetic resonance imaging, and high-resolution ultrasound (US), revealed a purely cystic lesion in the anterior upper mediastinum. Subsequent US-guided fine needle aspiration cytology (FNAC) confirmed the cystic nature. *In situ* parathyroid hormone (PTH) levels were elevated, leading to the diagnosis of a non-functioning PC. Surgical intervention was avoided, and symptomatic relief was achieved through US-guided cyst aspiration.

Conclusion: This case emphasizes the rarity of non-functioning PCs and underscores the importance of a comprehensive diagnostic approach, including imaging studies and FNAC with *in situ* dosage of PTH levels.

Keywords: Parathyroid cyst, FNAC, *in situ* PTH, diagnosis, case report.

Received: 25 February 2024 **Accepted:** 01 April 2024 **Type of Article:** CASE REPORT **Specialty:** Radiology

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Introduction

Parathyroid cysts (PCs) are rare, constituting less than 0.5% of parathyroid lesions. PCs are often asymptomatic or present with non-specific symptoms, posing challenges for accurate diagnosis.

Case Presentation

A 22-year-old female with no medical or surgical history presented for pre-operative assessment of a painless, growing left cervical mass. The patient had no symptoms of dysphagia, dyspnea, voice changes, or urolithiasis. Physical examination revealed a firm, mobile mass. Serum calcium, thyroid stimulating hormone (TSH), and parathyroid hormone (PTH) levels were normal.

Imaging Findings

A contrast-enhanced neck computed tomography (CT) scan was first performed demonstrating a cystic mass of the anterior upper mediastinum, developed under the left lobe of the thyroid gland displacing laterally the main carotid arteries without signs of invasion (Figure 1). The mass caused a right-sided displacement of the trachea without luminal stenosis and backward displacement of the esophagus without apparent communication (Figure 2). There was a normal thymic remnant which appeared to be at a distance from the cystic lesion. There were no abnormalities along the midline path of the thyroglossal duct (Figure 3). Magnetic resonance imaging (MRI) confirmed the purely cystic nature of the lesion (Figure 4). An ultrasound (US) using a high-resolution linear probe (18 MHz) and a micro convex probe (12 MHz) was performed for further evaluation. It showed a well-defined extrathyroid homogeneous cystic lesion (Figure 5). The thyroid was of normal size and echogenicity raising the suspicion of a PC.

Discussion

Background

PCs are a rare entity representing less than 0.5% of parathyroid glands' pathologies and account for 1%-5% of neck masses [1]. They can be found from the angle of the mandible until the mediastinum and are divided into two categories: functioning and non-functioning [1]. PCs seem to have a female predilection with a male: female ratio 1:2.5 [2]. The majority of PCs arise from the inferior parathyroid gland [3,4].

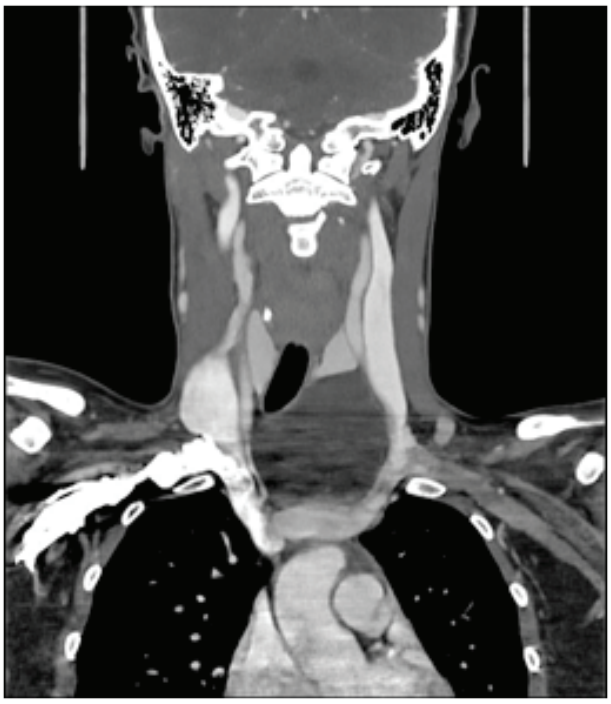

Figure 1. *Contrast-enhanced coronal CT scan showing a low attenuation homogenous cystic lesion in the anterior and upper mediastinal area, displacing the left lobe of the thyroid gland and the main carotid arteries.*

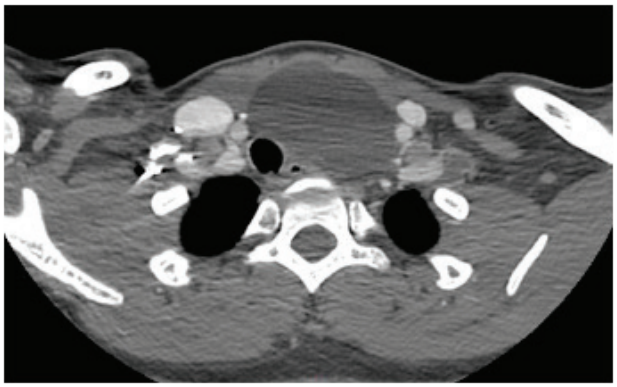

Figure 2. *Contrast-enhanced axial CT scan showing a right side of the trachea without luminal stenosis and backward displacement of the esophagus with no gas component in the cystic lesion.*

Clinical perspective

PCs can be asymptomatic or show several symptoms such as neck swelling or lump, neck pain, dyspnea, dysphagia, hoarseness, and signs of hyperparathyroidism [5-9]. Due to their non-specific symptoms and overlapping radiographic features with other neck masses, accurate diagnosis can be challenging.

Imaging perspective

The initial evaluation of a cystic neck mass should include a thorough history, physical examination, and imaging studies. The US remains a valuable method for accurate diagnosis of PCs. US-guided fine needle aspiration cytology (FNAC) can aid in the diagnostic approach by analyzing the cystic fluid composition and *in situ* PTH levels. In our case, a US-guided FNAC was performed revealing clear fluid that was sent to a laboratory for cytologic examination and *in situ* dosage of thyroglobulin (TG) and PTH (Figure 6) levels. The cytologic examination confirmed the cystic nature of the lesion. *In situ* TG level was negative, ruling out the diagnosis of thyroid cyst (TC). *In situ* PTH level was high (314 ng/l) and serum PTH level was normal. The diagnosis of a non-functioning

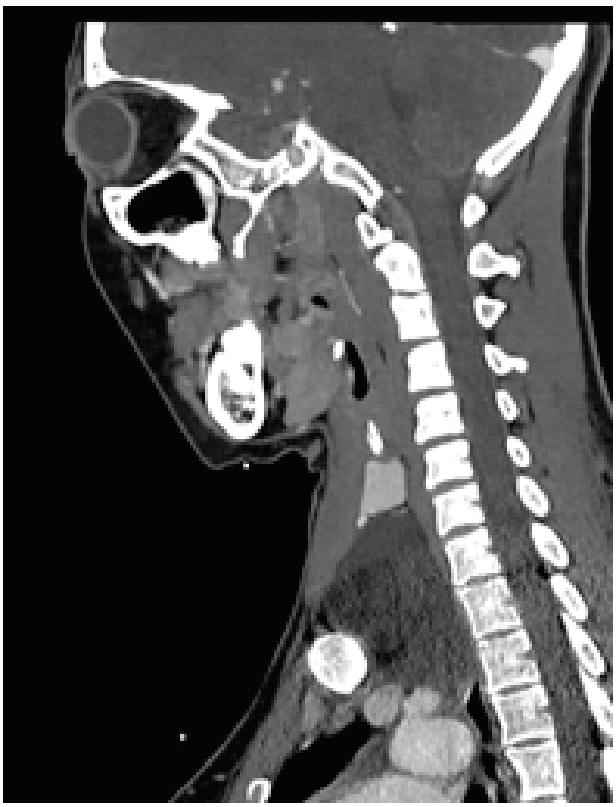

Figure 3. *Contrast-enhanced sagittal CT scan showing no abnormalities along the path of the thyroglossal duct.*

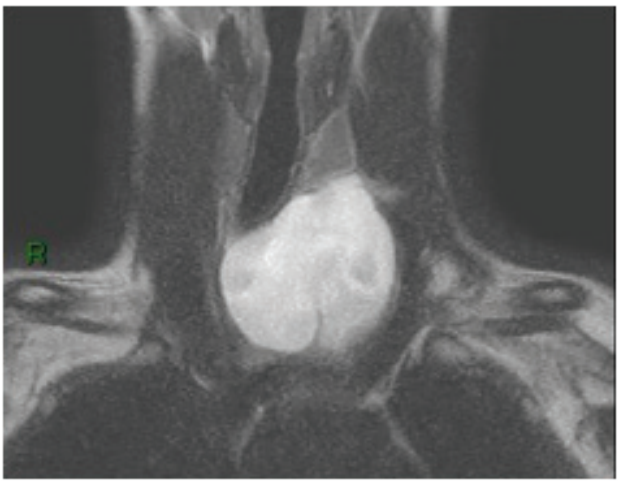

Figure 4. *Coronal T2 MRI showing a hypersignal intensity cystic lesion of the neck.*

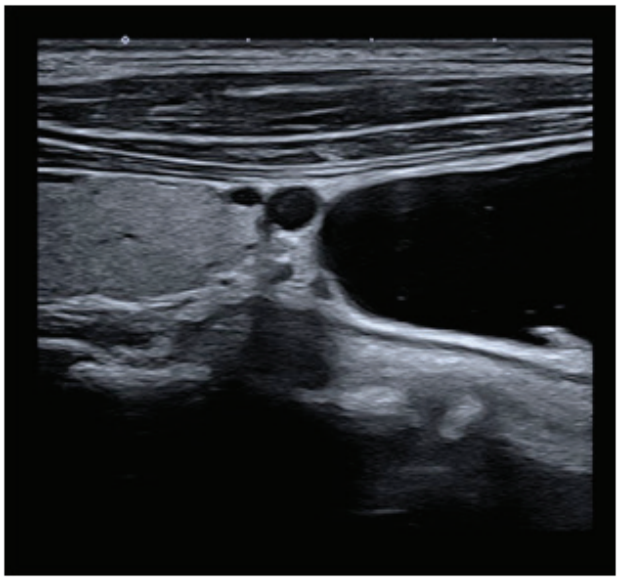

Figure 5. *A well-defined cystic lesion with homogenous anechoic content adjacent to the inferior pole of the left thyroid lobe.*

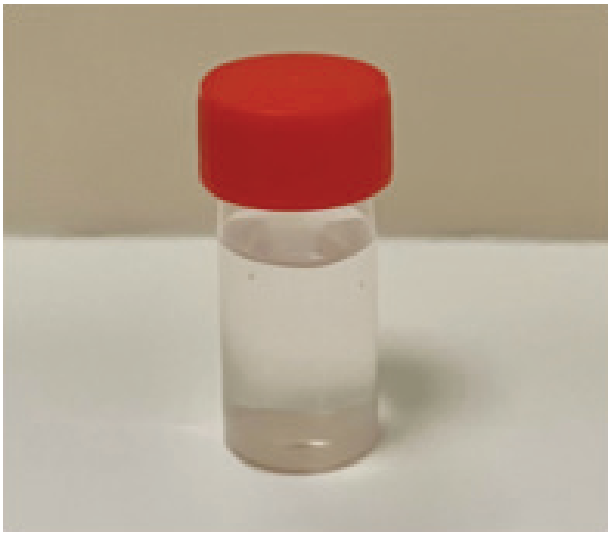

Figure 6. *FNAC revealed clear fluid that was sent to laboratory for cytologic examination and in situ dosage of TG and PTH.*

PC is confirmed. The surgical approach was then canceled and replaced by US-guided cyst aspiration relieving the symptoms of the patient.

Outcome

Once a PC is diagnosed, the management should be individualized based on the patient's symptoms. Asymptomatic, small non-functioning cysts can be managed conservatively. However, larger symptomatic or functioning cysts warrant aspiration, alcohol sclerotherapy, or surgical intervention [8]. Intraoperative monitoring of PTH levels is a valuable tool to confirm the successful removal of the PC [8].

Final Diagnosis

A non-functioning PC.

Differential Diagnosis List

1. PCs.
2. Thyroid cysts.
3. Thyroglossal duct cysts.
4. Cystic lymphadenopathy.
5. Branchial cleft cysts.
6. Lymphatic Malformation.

Teaching Points

- TCs are the most common differential diagnosis of non-functioning PCs [1]. FNAC and *in situ* dosage of TG/PTH levels can rule in or out the diagnosis.
- Thyroglossal duct cysts are to be considered in the presence of a typical midline cystic mass that moves with swallowing or tongue protrusion. In this case, consider FNAC and *in situ* dosage of TG.
- Suspicious thyroid nodules or a history of malignancy should raise the suspicion of cystic lymphadenopathy.
- Branchial cleft cysts occur in younger individuals and are located along the anterior border of the sternocleidomastoid muscle [1].
- A lymphatic malformation can also present as a cystic neck mass typically in childhood and can cause compressive symptoms [10].

Conclusion

This case emphasizes the rarity of non-functioning PCs and underscores the importance of a comprehensive diagnostic approach, including imaging studies and FNAC with *in situ* dosage of PTH levels.

What is new?

This case report highlights the importance of considering the diagnosis of an uncommon cystic presentation of a parathyroid nodule and systematic dosage of *In situ* PTH to rule in or out the diagnosis.

List of Abbreviations

CT	Computed tomography
FNAC	Fine needle aspiration cytology
MRI	Magnetic resonance imaging
PC	Parathyroid cyst
PTH	Parathyroid hormone
TC	Thyroid cyst
TG	Thyroglobulin
US	Ultrasound

Declaration of conflicting interests

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

None.

Consent for publication

Due permission was obtained from the patient to publish the case and the accompanying images.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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Summary of the case

1	**Patient (gender, age)**	Female, 22-year-old
2	**Final diagnosis**	A non-functioning PC.
3	**Symptoms**	A painless growing left cervical mass.
4	**Medications**	N/A
5	**Clinical procedure**	FNAC - In situ dosage of PTH and TG confirming the diagnosis of a non-functioning PC and avoiding further investigation and surgery.
6	**Specialty**	Radiology