

## CASE REPORT

## Diagnosis and Management of Parathyroid Cysts: Description with Two Cases

Koray Aydođdu<sup>1</sup>, Furkan řahin<sup>1</sup>, Funda İncekara<sup>1</sup>, Gktrk Fındık<sup>1</sup>, Sadi Kaya<sup>1</sup>, Yetkin Ađakırın<sup>2</sup>

<sup>1</sup>Clinic of Chest Disease, Atatrk Chest Disease and Chest Surgery Training and Research Hospital, Ankara, Turkey

<sup>2</sup>Department of Pathology, Yıldırım Beyazıt University Faculty of Medicine, Ankara, Turkey

## Abstract

Parathyroid cysts are unilocular, thin-walled cysts, and they are seen very rarely. Their formation mechanisms are not clear. They are usually localized in the cervical region, and mediastinal settlements are rare. They are usually asymptomatic, but cysts that have settled in the neck may be symptomatic, such as tracheal pressure symptoms. There are two types-namely, functional cysts and non-functional cysts-depending on their hormonal characteristics. There are still difficulties in the diagnosis, and they can be mistaken by thyroid pathology. Treatment is surgery. We discussed two cases of parathyroid cysts that we surgically excised.

**KEY WORDS:** Parathyroid cysts, surgery, symptom

**Received:** 20.01.2014

**Accepted:** 08.10.2014

**Available Online Date:** 18.11.2014

### INTRODUCTION

Parathyroid cysts are rare lesions develop from parathyroid glands and usually localized on the neck and rarely in the mediastinum. Cysts are divided into two groups, functional and non-functional, in relation to their hormonal characteristics. Functional cysts are a rare cause of hyperparathyroidism. They are usually asymptomatic but can be symptomatic because of the mechanical pressure of those cysts to neighbor structures.

### CASE PRESENTATIONS

#### Case 1

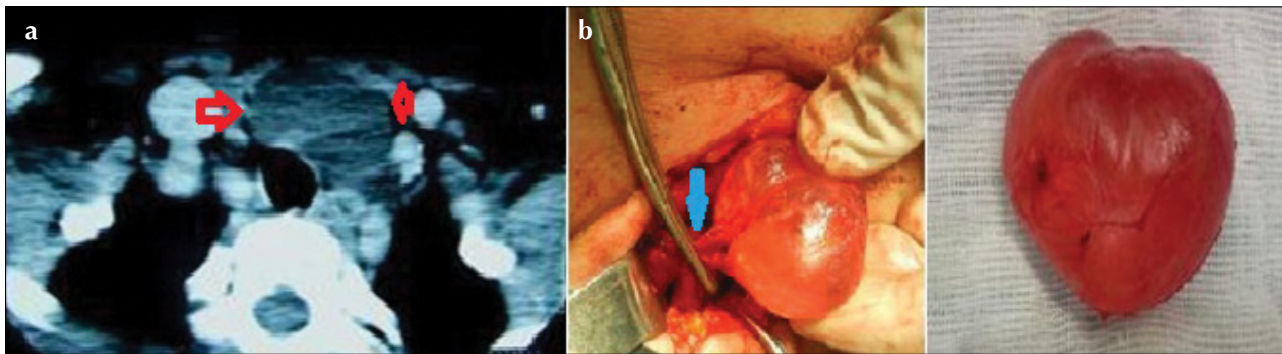
A 47-year-old female was admitted to our clinic with a complaint of dyspnea lasting for 3 months and increasing in severity. A posteroanterior chest graph (PACG) taken upon submission showed minimal mediastinal enlargement. Computed tomography (CT) of the thorax taken upon this finding showed an anterior mediastinal mass lesion that settled in the extension of the left thyroid lodge (Figure 1A). Because this lesion with a mediastinal extension had a cystic component, the radiologist in charge assessed that it may be a thymic cyst. The patient was hospitalized with plunging goiter, thymoma, and thymic cyst pre-diagnosis.

During the physical examination done at our clinic, expiration sounds were found to be normal in both lungs. No palpable mass was detected in the neck during palpation. Results of all routine examinations (biochemical and coagulation parameters and thyroid function tests) were in the normal ranges, except for low hemogram levels due to anemia, and the patient had no further complaints, other than chronic iron deficiency anemia. Thyroid ultrasonography (USG) showed that the lesion extended to the mediastinum from the inferior neighborhood of the thyroid. The lesion trailed in the pre-tracheal area had an approximate size of 4.5 × 2.5 cm. An operation was scheduled for the purposes of diagnosis and treatment.

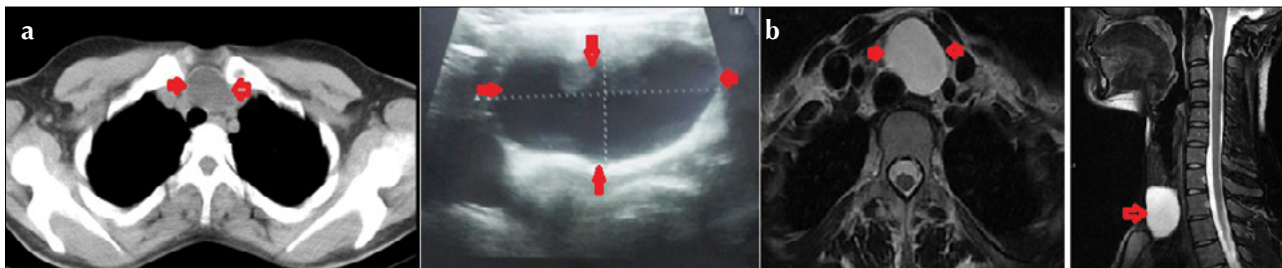
After receiving approval of the institutional review board and after gaining written informed consent from the patient, a collar incision was made on the patient, who was in the supine position. After subdermal tissues were dissected, we reached a cyst that was localized inferior to the left lobe of the thyroid and approximately 5 × 3 cm in size. The cyst was dissected completely without damaging the adjacent tissues (Figure 1B). The result of the pathological analysis was a parathyroid cyst.

The patient discharged after 5 days without any complication. She is under follow-up for 1 year, and there is no problem.





**Figure 1.** (a) CT: A mass lesion in the anterior mediastinum, into the continuation of the left thyroid gland (b). The excision steps of the cyst with a size of 5 x 3 cm, located inferior to the left lobe of the thyroid



**Figure 2.** (a). Thorax CT and cervical ultrasonography images (b). MR: the lesion was localized very near to vascular structures and the trachea

### Case 2

A 28-year-old woman was diagnosed with tuberculosis 1 year ago, and she was under follow-up with tuberculosis drug treatment. At the end of the treatment, a thorax CT was taken in order to evaluate the results of treatment and revealed a cystic lesion localized in the neighborhood of the common carotid artery on the left side of the neck tissue (Figure 2A). She was referred to our clinic for surgery. In the physical examination done in our clinic, expiration sounds were found to be normal in both lungs. The lesion was palpable on the left side of the neck during palpation. Results of all routine examinations were in the normal ranges. Cervical ultrasonography showed a uniloculated cystic lesion with a large contact surface to the thyroid gland (Figure 2A). A cervical MR was taken in order to identify its relationship with vascular structures. In the cervical MR, the lesion was localized very near to vascular structures, and no invasion was revealed (Figure 2B). Ultrasonography-guided fine-needle aspiration for the diagnosis was not feasible due to the thin-walled said and very near to vascular structures. Thus, both diagnosis and treatment plan, the operation the patient was prepared.

After receiving approval of the institutional review board and after gaining written informed consent from the patient, a collar incision was applied to the patient in the supine position. After subdermal tissues were dissected, we reached a cystic lesion approximately 4 x 3 cm in size. The cyst was dissected completely without damaging adjacent tissues. The result of the pathological analysis was a parathyroid cyst. There was no complication observed in the postoperative period.

### DISCUSSION

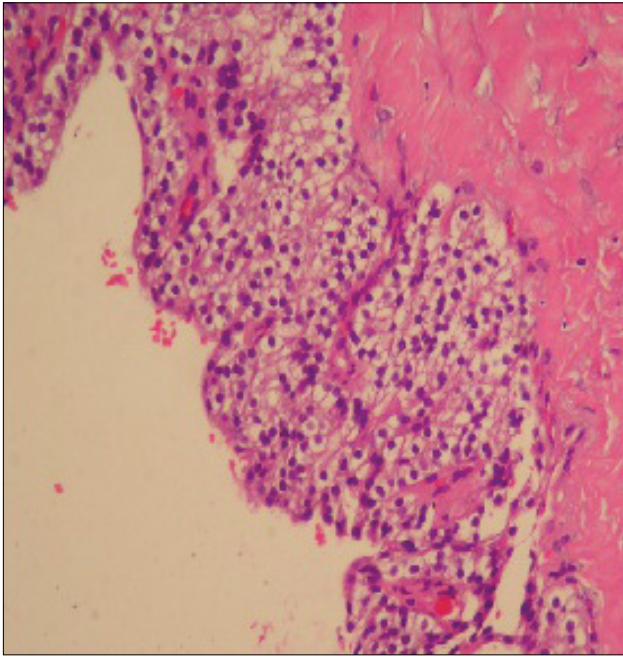
Parathyroid cysts are extremely rare lesions. Developing from parathyroid glands, these lesions are usually localized on the neck [1]. Ectopic placements are usually inside the medias-

tinum and inside or around the pretracheal, retrotracheal, and thymus glands. Their development mechanisms are not very well known, but some theories are reported. Also, cystic degeneration is seen in most of these cysts [2].

Parathyroid cysts are generally seen in the 4<sup>th</sup> and 5<sup>th</sup> decades. It can also occur in both sexes, but the incidence is higher in males (M/F=2.5:1). They are usually asymptomatic. Tracheal deviation, difficulty swallowing, hoarseness, pain, mass on the neck, or shortness of breath can be seen because of the mechanical pressure of those cysts, which is located in the mediastinum, especially due to neighboring structures [3-6]. Cystic mass can be palpable during the physical examination. One of our cases had a palpable mass during a neck examination. The literature also mentions about the symptoms of thrombus due to innominate vein pressure and hemorrhage due to degeneration of the cyst wall. So, the probability of this complication was one of the reasons we applied surgery to both of our cases.

They are thin-walled unilocular lesions containing clear liquid. Islands consisting of parathyroid cells (chief cell) with normal structure were observed in the cyst walls (Figure 3). The interior side of the wall consists of cuboidal or columnar cells [2]. The liquid component is very rich in terms of parathormone. The size of these cysts varies between 5 and 12 cm [3]. The cysts in our cases were about 5 cm in size.

Cysts are divided into two groups, functional and non-functional, in relation to their hormonal characteristics. Approximately 40% of all parathyroid cysts are functional cysts. [7]. Because of the parathormone that they secrete, they may cause hyperparathyroidism and hypercalcemic crisis. Functional cysts can also be accompanied by MEN type 1 [3-5]. Both of our cases were nonfunctional parathyroid cystic lesions.



**Figure 3.** Thin-walled unilocular lesions consisting of parathyroid cells (chief cell) with normal structure

The preoperative diagnosis of parathyroid cysts is very difficult. Ultrasonography, CT, and magnetic resonance imaging (MRI) are supportive for the diagnosis. CT and MRI are used to determine the exact location of the lesion and the relationship with surrounding tissues and adjacent vascular structures. The definitive diagnosis is established by aspiration of cystic liquid, biochemical testing of that sample, and finding parathormone [6]. In the differential diagnosis of parathyroid cysts, thyroid cysts, thymic cysts, thyroglossal duct cysts, and bronchogenic cysts should be considered [6,7].

Surgical excision may be preferred for treatment. The surgical approach may be thoracotomy, cervical cuts, or trans-sternal, depending on the location of the lesion. We used a collar incision approach for this lesion in the neck with mediastinal extension. As an alternative to surgery for non-complicated non-functional cysts, fine-needle aspiration may also be used, and sclerosing agents, such as tetracycline and ethanol, may be injected into the cyst. We did not use this method, because parathyroid cysts have a recurrence tendency after aspiration. In the postoperative period, we did

not have any complication, and no recurrence has been observed to date.

As a conclusion, parathyroid cysts are rare lesions and can cause different complications, as mentioned. We aimed to report two cases with parathyroid cysts to create a wealth of literature and to share our experiences.

**Informed Consent:** Written informed consent was obtained from the patients who participated in this case report.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - K.A.; Design - F.İ., F.Ş.; Supervision - G.F., S.K.; Funding - F.İ., Y.A.; Materials - K.A., F.Ş.; Data Collection and/or Processing - F.Ş.; Analysis and/or Interpretation - K.A., F.İ., G.F., S.K.; Literature Review - F.İ., Y.A., S.K.; Writer - K.A., F.Ş.; Critical Review - K.A., G.F., S.K.; Other - F.İ., Y.A.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study has received no financial support.

#### REFERENCES

1. Kaplanoglu V, Kaplanoglu H, Ciliz DS, Duran S. A rare cystic lesion of the neck: parathyroid cyst. *BMJ Case Rep* 2013;pii: bcr2013200813.
2. Shields TW, Immerman SC. Mediastinal parathyroid cysts revisited. *Ann Thorac Surg* 1999;67:581-90. [\[CrossRef\]](#)
3. Suzuki K, Sakuta A, Aoki C, Aso Y. Hyperparathyroidism caused by a functional parathyroid cyst. *BMJ Case Rep* 2013;pii: bcr2012008290.
4. Ihm PS, Dray T, Sofferan RA, et al. Parathyroid cysts: diagnosis and management. *Laryngoscope* 2001;111:1576-8. [\[CrossRef\]](#)
5. Tamiya H, Miyakawa M, Suzuki H, et al. A large functioning parathyroid cyst in a patient with multiple endocrine neoplasia type 1. *Endocr J* 2013;60:709-14. [\[CrossRef\]](#)
6. Pontikides N, Karras S, Kaprara A, et al. Diagnostic and therapeutic review of cystic parathyroid lesions. *Hormones* 2012;11:410-8. [\[CrossRef\]](#)
7. Uludag M, İsgor A, Yetkin G, et al. Supernumerary ectopic parathyroid glands. Persistent hyperparathyroidism due to mediastinal parathyroid adenoma localized by preoperative single photon emission computed tomography and intraoperative gamma probe application. *Hormones (Athens)* 2009;8:144-9. [\[CrossRef\]](#)