

## CASE REPORT

## Case of Unusual Cyst in the Neck-Parathyroid Cyst

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### INTRODUCTION

Parathyroid cysts are rare lesions normally located in the neck and exceptionally in the mediastinum, in about 10% of the cases<sup>1</sup>. They are normally asymptomatic and frequently omitted in differential diagnosis of neck masses. It is still possible to cause compressive symptomatology, hyperparathyroidism, in addition to recurrent laryngeal nerve paralysis.

Cysts may be classified as functioning and nonfunctioning depending on the association with primary hyperparathyroidism; most of the cases are nonfunctioning.

Its importance lies in the diagnostic difficulty; it is normally mistaken by thyroid pathology, meaning that it is normally diagnosed only in the surgical act.

The purpose of the present study was to report a case of parathyroid cyst that simulated thyroid nodule, discussing diagnostic aspects.

### Case Report

A 28 year old female presented with asymptomatic swelling in the left side of the neck of one year duration. She did not report dyspnea, odynophagia, dysphagia or dysphonia. (Fig. 1)

TSH and Free T4 levels were normal and antithyroid antibodies were negative.



Fig-1: Swelling in the left side of the neck

Ultrasound neck demonstrated 40x30 mm cystic lesion in the left lower part of thyroid. The rest of the thyroid gland appeared normal. (Fig. 2)

Fine needle aspiration cytology was done and 6 ml of clear watery fluid aspirated. On suspicion intact PTH assay was done. PTH value was 127pg/ml in the aspirated fluid. The cytological analysis revealed acellular smears and not possible to define the origin of lesion. (Fig. 3)

Serum PTH, Calcium and Phosphorus were normal. Sestamibi scan showed the presence of a non functioning area near the left lower pole of thyroid. (Fig. 4)

The patient was taken up for surgery as the swelling recurred within one month after aspiration. Intraoperatively 5x3cm clear cystic lesion with thin walls and a definite cleavage between cyst and the surrounding thyroid tissue found near the left lower pole of thyroid. (Fig. 5)

The left upper parathyroid and recurrent laryngeal nerve on same side identified and preserved.

Right superior and inferior parathyroids and thyroid gland found to be normal.

Intraoperatively cyst aspiration was done again and the PTH value was 345pg/ml in the aspirated fluid. (Fig. 6)

The cyst was removed intoto and sent for histopathological examination. (Fig. 7 & 8)



Fig. 2 : Ultrasonogram Neck showing 40×30mm cystic lesion in the left lower part of thyroid

Histopathological examination revealed cyst with a capsule composed of fibroadipose tissue adherent to the residual parathyroid parenchyma. (Fig. 9)

On follow up for 13 months patient found to be asymptomatic. Her serum calcium values were within normal limits.

## Discussion

Parathyroid cysts are pathologies considered to be rare, comprising about 250 cases described in the literature<sup>1,2,3</sup>. The exact incidence is still discussed, given that in one study its occurrence ranged from 0.08 to 0.4% of the cases of thyroid or parathyroid resection<sup>4</sup>. In a study with thyroid and parathyroid specimens examined within a period of 15 years, parathyroid cysts were found in 0.6%<sup>3</sup>.

Parathyroid cysts occur in both genders, with the proportion of 2.5:1 women to men, normally at the 4th and 5th decades of life<sup>7</sup>. The vast majority is located in lower parathyroid glands, described from the parathyroid lesions, cysts may occur in ectopic locations, especially the thymus and mediastinum. About 10% of the cases are visualized in the mediastinum, normally in the anterior region<sup>1</sup>.

Pathogenesis of parathyroid cysts is uncertain, and there are some theories that explain its origin :

(1) as embryological remains of 3rd and 4th branchial arches, causing increase in volume by accumulation of secretion forming a macrocyst;

(2) degeneration, infarction or hemorrhage of parathyroid or gland adenoma;

(3) coalescence of microcysts of normal or adenomatous parathyroid aspect;

(4) persistence of Kustneiner canal, which are vesicular canals in fetus or gland remains, and

(5) retention of parathyroid hormone (PTH) in colloid vesicles<sup>8</sup>. Despite these embryological theories, there are no reports of parathyroid cysts in children<sup>1,3,8,9</sup>.

Parathyroid cysts may be classified as functioning and nonfunctioning depending on the association with hyperparathyroidism. The functioning type normally results from degeneration of true parathyroid adenoma<sup>9</sup>. Patient with functioning cysts tend to be men, being 1.6 times more frequent than in women and of older age<sup>1,3</sup>. Nonfunctioning cysts are described as the most common, predominantly in women. They are normally described as asymptomatic neck masses. According to Clark *et al.*<sup>1</sup>, in both types, the content of the cyst presents high concentrations of PTH<sup>1,3,8,9</sup>.

Most parathyroid cysts are asymptomatic. The main symptoms caused by the local compressive effect of the lesion when it becomes larger include dysphagia, hoarseness, pain, neck mass or dyspnoea by tracheal deviation<sup>5</sup>. Hoarseness is caused by vocal fold paresis, which can be explained by edema and fibrosis of recurrent laryngeal nerve combined with pressure or traction of the cyst wall<sup>10</sup>. There are also symptoms resulting from hyperparathyroidism, with elevation of serum calcium and repercussions at the central nervous and neuromuscular systems, gastrointestinal tract, kidneys and cardiovascular system<sup>5</sup>. The common presentation of parathyroid cyst is, however, asymptomatic neck mass, as observed in our case. They are frequently mistaken by thyroid pathology, as described by Piccinato *et al.*<sup>2</sup> or cysts of other nature. They



Fig.3 : Fine needle aspiration 6ml of clear watery fluid aspirated

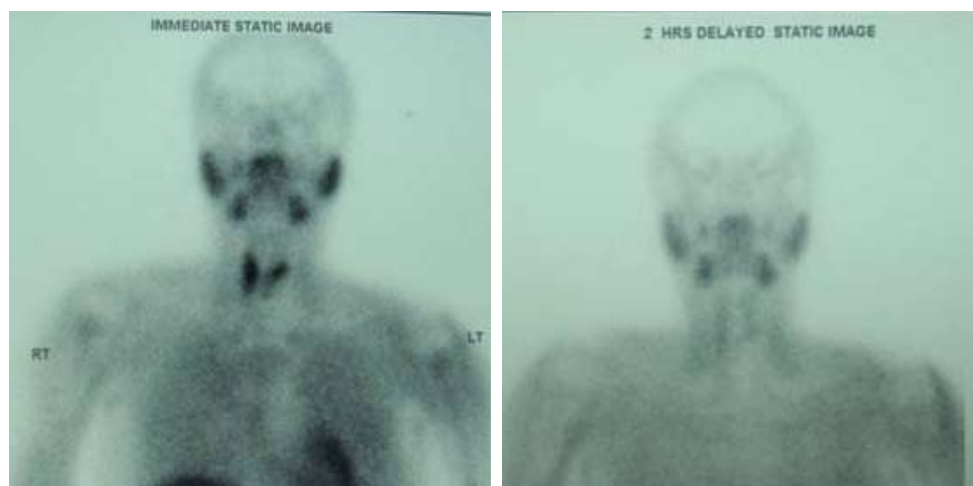


Fig. 4 :  
Sestamibi Scan showed  
no abnormal focal  
retention of tracer  
in the left-sided neck  
swelling.

may also be occasionally found during surgical exploration or radiological imaging tests<sup>3</sup>. The physical examination shows solitary mass of cystic consistency, non-painful and mobile during swallowing<sup>5,8</sup>. Other characteristic is that parathyroid cysts may vary concerning size, as demonstrated by Coates *et al.*<sup>11</sup>, adding more difficulty to diagnosis.

Differential diagnosis extends from thyroglossus duct cyst, branchial arch cyst, thyroid adenoma to parathyroid carcinoma<sup>6,11</sup>. Preoperative suspicion of parathyroid cyst is extremely important, considering the complexity of the diagnostic confirmation, especially because most of them are diagnosed intraoperatively or in the clinical analysis of the surgical specimen.

Among the complementary tests that can be helpful, fine needle aspiration biopsy is well defined as first line test in the investigation of neck masses owing to its technical facility, low cost and minimum invasion of tissues. In some cases, it may prevent unnecessary surgery or it may

support surgical planning, providing analysis of characteristics of the cyst's content and cytological aspects<sup>12</sup>. Absher *et al.*<sup>12</sup> studied 12 cases of parathyroid cysts and their main findings were water-clear liquid, aqueous and slightly bloody, predominantly acellular, with rare inflammatory cells or macrophages. This study showed difficulty to differentiate parathyroid cyst from some thyroid lesions, such as follicular lesions, which may exist concomitantly with these pathologies<sup>9,12</sup>.

Most studies agree that the presence of fluid, glossy, aqueous liquid is highly suggestive of parathyroid cyst, indicating verification of PTH dosage in the liquid to determine the diagnosis<sup>5,7,12</sup>. The analysis of intra-cyst liquid containing high levels of PTH portion C-terminal alone or combination of PTH portion N-terminal with high serum level is diagnosed as parathyroid cyst<sup>5</sup>. Both in functioning and nonfunctioning cysts, dosage of intra-cyst PTH is higher than serum levels. In nonfunctioning cysts the level of PTH reported is 6-416pg/ml, with normal

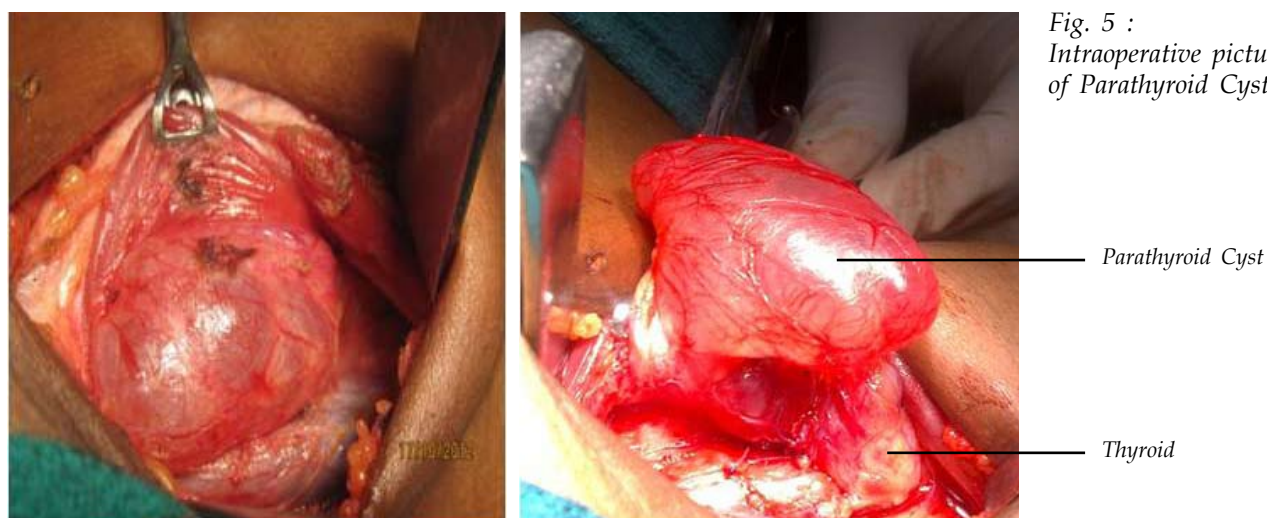


Fig. 5 :  
Intraoperative picture  
of Parathyroid Cyst

Parathyroid Cyst

Thyroid



serum levels, whereas in functioning cysts there are higher levels of 2000-6000pg/ml<sup>10</sup>. In our case, the value of PTH in the cyst liquid was 345pg/ml, which goes by the literature given that it was a nonfunctioning cyst.

Imaging tests are indicative of cystic neck solitary lesion, but they are not conclusive.<sup>5</sup> Ultrasound (US) showed a cystic, anechoic structure with thin walls and posterior hyperechoic enhancement.<sup>3,13</sup> According to Gooding *et al.*<sup>8</sup> parathyroid cysts may not be differentiated from thyroid cysts through ultrasound. CT scan and Magnetic Resonance Imaging (MRI) demonstrate only neck mass with cystic content and their anatomical relations. Thyroid scintigraphy may reveal the presence of nonfunctioning cysts, but it does not distinguish the lesion in thyroid or parathyroid<sup>3</sup>.

Histology characteristics of parathyroid cysts are normally thin internal walls, comprising connective tissue and parathyroid cell islands, a solitary layer of cuboid and columnar cells with glycogen positive staining<sup>5,7</sup>. The presence of parathyroid tissue on the cyst wall is diagnostic indication. The cyst may be adhered to the thyroid tissue, but it is easily separated from it.<sup>1,5</sup>

Treatment for nonfunctioning cysts without complications may be US guided aspiration, once there are no reports of malignancy.<sup>14</sup> Sclerotherapeutic substances may be introduced even though they are not universally accepted owing to complications, such as neurotoxicity or recurrent laryngeal nerve paralysis. Okamura *et al.*<sup>15</sup> in their study with 5 patients, out of which 4 were treated with sclerotherapeutic agents, suggested that tetracycline has low risk, low cost and is effective in treating parathyroid cysts. In case of recurrence of cysts complicated by symptoms of dysphagia,



Fig. 8 : Specimen picture (Parathyroid Cyst)

dyspnoea or recurrent laryngeal paralysis, primary treatment should be surgical. The treatment of functioning cyst is always surgical.<sup>15</sup> These lesions with hormonal alterations have high risk of affecting other parathyroid glands, which can be identified during surgery<sup>1</sup>. Macroscopic observation of parathyroid cysts intraoperatively is of a solitary unilocular cyst adhered to the thyroid tissue, but the defined cleavage plane has thin, glossy and clear content walls, in the lower portion of the neck. Mediastinum cysts are normally treated with surgery<sup>14</sup>. In many series, including the one by Rosenberg *et al.*<sup>3</sup>, lobectomy or partial thyroidectomy were advocated in treating parathyroid cysts. Preoperative



Fig. 7 : After the cyst was removed in toto

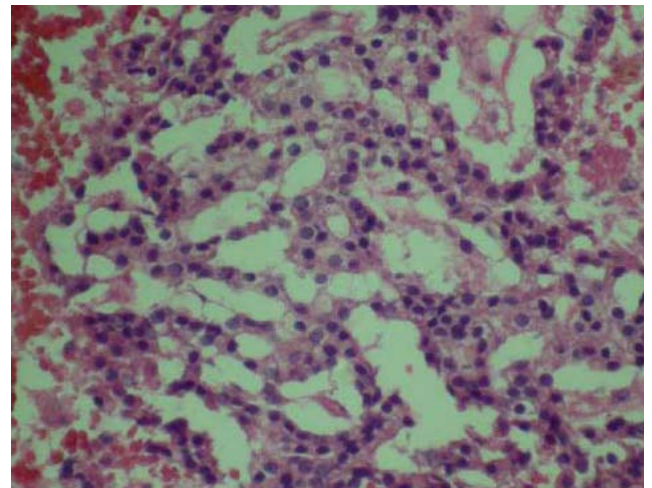


Fig. 9 : Low power view Parathyroid cyst

consideration, however, about the diagnostic possibilities, intraoperative frozen analysis and fluid examination may prevent excision of thyroid gland.

## Conclusion

This case report exemplifies diagnostic difficulties in preoperative parathyroid cysts, confirming the literature data and drawing attention to the importance of including it in the differential diagnosis of neck cysts.

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