



Anatomical Description of Location of Parathyroid Adenoma: Case Series

KEYWORDS

Parathyroid, Adenoma, Hyperparathyroidism, Anatomy, Localization

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ABSTRACT Parathyroid adenoma accounts for the majority of cases of primary hyperparathyroidism. Mainstay of treatment is surgery. Preoperative localization and intra operative identification of adenoma is essential for the definitive treatment. We present a case series of parathyroid adenomas with regard to anatomical localization. According to our study, Superior glands which are known to be more constant in position were found even at unusual positions like buried within the parenchyma of the thyroid.

Introduction

Parathyroid hormone is the chief regulator of calcium homeostasis in the human body which is secreted by parathyroid glands. These are usually four in number but can vary from 2 to 6. Superior glands are more constantly located midway along the posterior border which is developed from the 4th pharyngeal pouch. Inferior glands, develop from 3rd pharyngeal pouch, descend with the thymus could be found in aberrant locations in 10% of the cases [1]. They are commonly located below the inferior thyroid artery closer to the lower pole of the thyroid, while within 1cm from the lower pole being the 2nd commonest. Less commonly it can be located even in the superior mediastinum. Though usually its extra thyroidal, in extremely rare cases could be found within the parenchyma of the gland [2]. These variations make parathyroid exploration a surgical challenge.

Primary hyperparathyroidism (PHPT) results from inappropriate overproduction of parathyroid hormone from one or many parathyroid glands and presents with hypercalcemia. Primary hyperparathyroidism has a reported incidence of approximately 21 cases per 100,000 persons per year [3]. Solitary parathyroid adenoma accounts for approximately 85% of these cases. Less commonly, it may be caused by parathyroid hyperplasia, multiple adenomas and rarely by parathyroid carcinoma or a parathyroid cyst [4].

Methods and materials

We present a series of five cases of primary hyperparathyroidism presented with supra normal levels of intact PTH and serum calcium levels to department of surgery, Teaching Hospital Kandy, Sri Lanka. Among the sample 3 were males. One patient was re-explored with recurrence of Hyperparathyroidism. Pre-operative localization was done with high resolution USS neck and Scintigraphy, CT scan was done for selected cases. Parathyroid adenoma was identified with USS in all cases and confirmed by either scintigraphy or CT scan. Four gland exploration was performed in all cases.

Results

Patient 1

A 45 year old male presented with a pathological fracture of the Left femur found to have intact PTH level of 1711.2pg/ml. Right sided parathyroid adenoma was identified in the USS. Right sided extra-capsular mass was found at the lower pole of the thyroid during the exploration which confirmed by the histology as a parathyroid adenoma.

Patient 2

A 40 year old female presented with severe kypho-scoliosis diagnosed to have primary hyperparathyroidism with PTH level of 1019.4pg/ml. USS showed a 13*6mm hypo-echoic lesion in the Left lobe of the thyroid with features in favour of parathyroid adenoma which confirmed by the CT. Mild focal, abnormal, persistent tracer retention in the region of inferior pole of the Left lobe of the thyroid gland was seen in the scintigraphy. Routine four gland exploration revealed an extra-capsular parathyroid tumour at the inferior pole of the Left thyroid.



Fig 1. Specimen showing parathyroid adenoma of left inferior gland

Patient 3

A 62 year old female who was investigated for body aches found to have a palpable neck lump with elevated serum PTH of 1851pg/ml. Well defined hypo-echoic lesion in the posterior aspect of the left lobe of the thyroid gland which was seen in the USS, confirmed by the isotope scan with

the evidence of thyroid tissue being replaced by parathyroid in the upper half. Surgical exploration confirmed a parathyroid adenoma within the parenchyma of the thyroid.



Fig 2. Abnormal tracer retention in left inferior parathyroid gland

Patient 4

A 60 year old male presented to orthopaedic unit with a pathological fracture of the Left humerus and osteopenia, further investigated and found to have a PTH value of 1803pg/ml. USS neck found a hypo-echoic lesion deep to the Left lower pole of the thyroid gland confirmed by CT. An extra-capsular 2*1.5*1cm parathyroid adenoma was removed.

Patient 5

A 43 year old lady who underwent a Right side parathyroid exploration 3 years back presented with recurrence with a PTH of 121.2pg/ml. Preoperative localization with CT showed a parathyroid adenoma in the Left lobe of the thyroid. A focal abnormal uptake was shown in the isotope study in the Left upper pole of the thyroid. The adenoma was removed from the upper pole during the exploration.

Discussion

The commonest cause for PHPT is single parathyroid adenoma (80%). In our study all five cases were histologically diagnosed as parathyroid adenomas. In all patients intact PTH levels dropped down to normal limit following surgery. Even though the commonest site of an adenoma is not documented in the literature, our study showed left predominance with 3 cases out of 5. Inferior gland was involved in 66.6% of cases. Extra-capsular Inferior glands were found at a constant position in close proximity to the lower pole of the thyroid which was identified correctly by preoperative imaging. Superior glands which are known to be more constant in position were found even at unusual positions like buried within the parenchyma of the thyroid. USS, CT scan and isotope study were effective in preoperative localization of the adenoma in all five cases.

Conclusion

According to our study we would like to conclude that even the surgery for superior parathyroid gland needs de-

tailed exploration as the location can be unpredictable. Therefore preoperative localization with imaging and isotope study is highly recommended.

Reference

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