Radiology Case Reports 15 (2020) 672–674

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Retro-tracheal parathyroid adenoma: A rare location of a common pathology ☆

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ARTICLE INFO

Article history:
Received 20 February 2020
Revised 2 March 2020
Accepted 3 March 2020

Keywords:
Retro-tracheal mass
Mediastinal mass
Parathyroid adenoma
Hypercalcemia
Surgery
99m Tc-Sestamibi

ABSTRACT

Ectopic parathyroid adenoma in the mediastinum has been reported in several publications; however, its location in the posterior mediastinum, especially a retro-tracheal location, has been rarely reported. We report a case of a 61-year-old patient who presented with clinical symptoms of malignant hypercalcemia due to a retro-tracheal mediastinal parathyroid adenoma. The surgical excision normalized the phosphocalcic balance with improvement in the patient's clinical symptoms. An ectopic hypersecreting parathyroid adenoma with life-threatening hypercalcemia should prompt radiological assessment and appropriate surgical management to prevent significant clinical complications.

Introduction

Parathyroid adenomas in the setting of hyperparathyroidism are fairly common. The typical location of a parathyroid adenoma is in the region of the inferior parathyroid glands. Here we present a rare case of a pathologically proven retro-tracheal parathyroid adenoma, a rare and atypical location.

☆ Competing Interests: There are no conflict of interests to disclose.

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https://doi.org/10.1016/j.radcr.2020.03.003

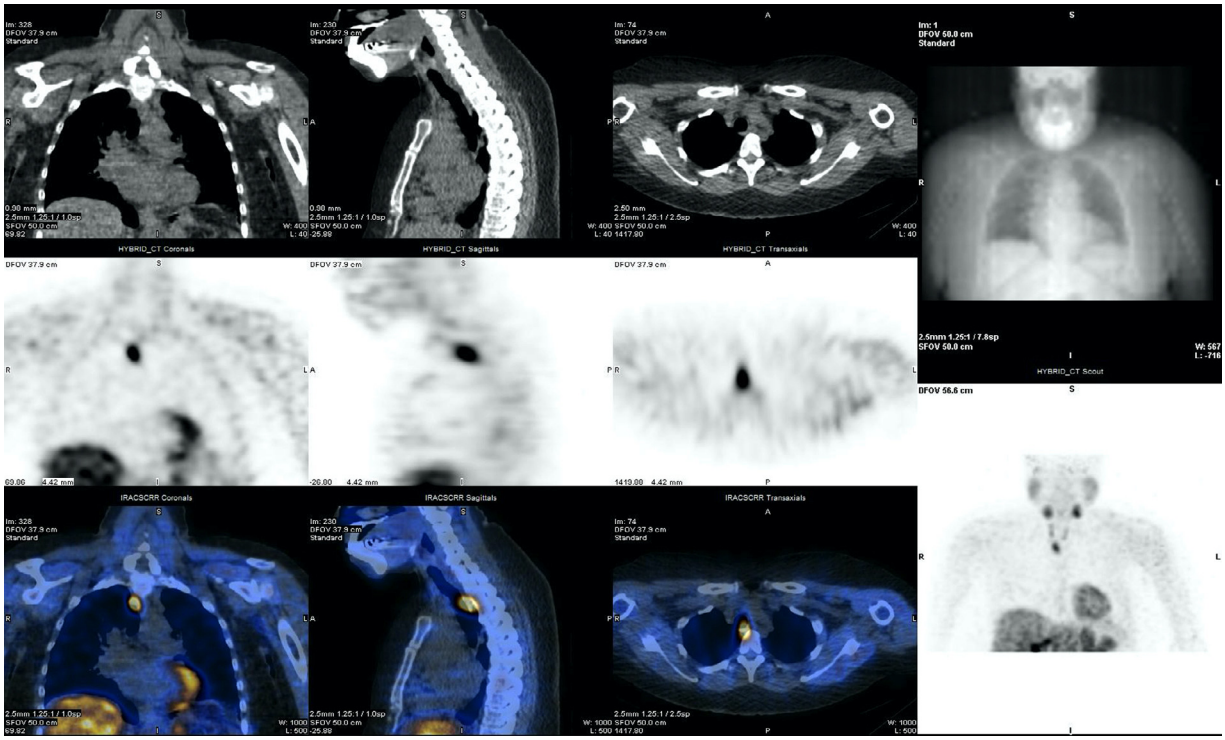

Fig. 1 – SPECT-CT following the administration of 16.0 mCi of 99m Tc-Sestamibi with reconstruction in the three standard orthogonal planes demonstrates focal sestamibi uptake in the midline retrotracheal region, separate from the right lateral aspect of the esophagus.

Case report

A 61-year-old female with a history of hyperparathyroidism and hypercalcemia presented to the hospital with complaints of generalized body weakness and multiple episodes of vomiting. The patient was seen by endocrinology in 2018 but was lost to follow up. At the time of the patients visit to the ED, serum calcium was 11.8mg/dl, albumin 3.6g/dl and PTH was 208.5pg/ml. Urine creatinine and calcium were ordered and were 765.0 mg/24hr and 97.5 mg/24hr respectively. The patient was assessed with a 99m Tc-Sestamibi scan as part of her workup. Focal uptake in the retro-tracheal region along the right lateral aspect of the esophagus was identified (Fig. 1). A CT scan of the neck was subsequently performed, which revealed a 2.4 × 1.3 cm enhancing prevertebral paratracheal/paraoesophageal mass that corresponded to the focus of increased 99m Tc-Sestamibi uptake. The patient underwent surgical exploration, and a retro-tracheal parathyroid adenoma measuring 2.5 × 1.5 × 0.5 cm was confirmed and removed. The patient tolerated the procedure well and was discharged without any complications for continued outpatient follow up. On follow up the patients calcium level was noted to be 9.1 mg/dl and her weakness improved.

Discussion

The incidence of parathyroid adenoma in patients treated for primary hyperparathyroidism is close to 80% [1]. Parathyroid adenomas typically occur in the inferior parathyroid glands. Although ectopic localization within the mediastinum has been reported, a retro-tracheal location remains rare [2,3].

Embryologically, the parathyroid glands originate from the third and fourth branchial pouch prior to migrating to the mediastinum[4]. The superior parathyroid glands originate in the thyroid near its upper pole, directly behind or at the cricothyroid junction. The inferior parathyroids originate within the thymus and descend in a posterolateral direction to the lower thyroid pole. This longer pathway can give rise to ectopic parathyroid tissue [5].

As the tissue migrates, cells can be left behind along its migration path and can subsequently develop into functioning parathyroid tissue. This is more common than some might think. In a case series of 231 patients, 16% were found to have ectopic parathyroid tissue [6]. As the migration path is in the anterior mediastinum, it is extremely rare to find tissue outside of this area [7].

Nuclear Medicine Scintigraphy is currently considered the technique of choice for suspicion of parathyroid adenomas due to its high sensitivity (95%) and better image quality than CT with a lower radiation dose delivered to the patient [8,9]. In the Mitchell Report, scintigraphy identified 16/17 cases of adenomas and 19/21 cases of glandular hyperplasia [10].

Complete resection of the tumor or ectopic tissue is the primary therapeutic procedure to alleviate the patient's symptoms. Surgery is recommended for both symptomatic and asymptomatic patients due to the significant morbidity associated with the disease [11–14]. In symptomatic patients, parathyroidectomy leads to normalization of phosphocalcic metabolism and an increase in bone density [15].

The most common postoperative complication is hypocalcemia. The absence of hypocalcemia suggests incomplete resection of the ectopic tissue. Persistent hypocalcemia more than 4 to 5 days after the surgery is often due to an avidity of bone for calcium, requiring phosphocalcic supplementation and vitamin D therapy [16].

REFERENCES

[1] Ruda JM, Hollenbeak CS, Stack BC. A systematic review of the diagnosis and treatment of primary hyperparathyroidism from 1995 to 2003. Otolaryngol Head Neck Surg. 2005;132:359–72 [PubMed][Google Scholar].

[2] Wang CA. The anatomic basis of parathyroid surgery. Ann Surg 1976;183:271–5 [PMC free article] [PubMed] [Google Scholar].

[3] Peeler BB, Martin WH, Sandler MP. Sestamibi parathyroid scanning and preoperative localization studies for patients with recurrent/persistent hyperparathyroidism or significant comorbid conditions: development of an optimal localization strategy. Am Surg 1997;63:37–46 [PubMed] [Google Scholar].

[4] Mihai R, Farndon JR. Parathyroid disease and calcium metabolism. Br J Anaesth 2000;85:29–43 [PubMed] [Google Scholar].

[5] Pamarthy S, Wong KK, Gross M, et al. Concise review of parathyroid embryology: pictorial guide to ectopic localization. JNM 2014;55(supplement 1):1275.

[6] Phitayakorn R, McHenry CR. Incidence and location of ectopic abnormal parathyroid glands. Am J Surg 2006;191:418–23 [PubMed] [Google Scholar].

[7] Hamaloglu E, Fani Bozkurt M, Dogan R. Unexpected detection of an intrathymic parathyroid adenoma by Tc-99m-MIBI scintigraphy: the role of scintigraphy in planning surgical treatment. Endocrinologist 2005;15:366–9 [Google Scholar].

[8] Ahuja AT, Wong KY, Ching AC. Imaging for primary hyperparathyroidism – what beginners should know. Clin Radiol 2004;59:967–76 [PubMed] [Google Scholar].

[9] Mullan BP. Nuclear medicine imaging of the parathyroid. Otolaryngol Clin North Am 2004;37:909–29 [PubMed] [Google Scholar].

[10] D'Avanzo A, Parangi S, Morita E. False positive 99mTc sestamibi scans in patients with osteitis fibrosa cystica and brown tumours. Eur J Surg 2001;167:592–7 [PubMed] [Google Scholar].

[11] Callender GG, Udelsman R. Surgery for primary hyperparathyroidism. Cancer 2014;120:3602–16 [PubMed] [Google Scholar].

[12] Hedbäck G, Odén A. Increased risk of death from primary hyperparathyroidism – an update. Eur J Clin Invest 1998;28:271–6 [PubMed] [Google Scholar].

[13] Hedback G, Oden A. Persistent disease after surgery for primary hyperparathyroidism: the long-term outcome. Eur J Endocrinol 2004;150:19–25 [PubMed] [Google Scholar].

[14] Hedback G, Oden A. Cardiovascular disease, hypertension and renal function in primary hyperparathyroidism. J Intern Med 2002;251:476–83 [PubMed] [Google Scholar].

[15] Silverberg SJ, Shane E, Jacobs TP, et al. A 10-year prospective study of primary hyperparathyroidism with or without parathyroid surgery. N Engl J Med 1999;341:1249–55 [PubMed] [Google Scholar] Google Scholar].

[16] Schomig M, Ritz E. Management of disturbed calcium metabolism in uraemic patients: indications for parathyroidectomy. Nephrol Dial Transplant 2000;15:25–9 [PubMed] [Google Scholar].