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Case Report

Parathyroid adenoma in a 33 years female, manifesting as non-traumatic multiple bone fractures

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ABSTRACT

A 33 years old female patient presented to OPD with chief complaints of prolonged fatigue, abnormal gait and difficulty in walking since 7 years. On further evaluation MRI pelvis revealed bilateral non-traumatic pelvic bone fractures, with high Serum parathyroid hormone level (1050 pcg/ml) and hypercalcemia. CECT Neck showed a well-defined soft tissue density lesion involving the posterior-inferior aspect of the right lobe of thyroid gland. Surgical resection was performed and histopathology revealed parathyroid adenoma. Clinical manifestations and PTH and calcium levels gradually decreased to normal after surgery. Patient's symptoms gradually decreased over a period of 2 month after treatment of the underlying cause. In a young female presenting with bony pains and non-traumatic fractures, a differential diagnosis of parathyroid adenoma must be kept in mind.

Keywords: Parathyroid adenoma, Hyperparathyroidism, Hypercalcemia, Non-traumatic fractures, Fatigue

INTRODUCTION

An adenoma is a benign growth that appears on one or more of the parathyroid glands. An adenoma causes the parathyroid gland to make more parathyroid hormone than the body needs, a condition called primary hyperparathyroidism. Too much parathyroid hormone upsets the body's normal calcium balance, which increases the amount of calcium in bloodstream. This disease is the most prevalent in people 50 to 70 years old, and the prevalence is about three times higher in females than in males.[1] Primary HPT is caused by a single parathyroid adenoma in 90% of patients and multigland disease in approximately 10%.[1]

The overexpression of cyclin D1, coded by CCND1, is a well-known cause of sporadic hyperparathyroidism. Cyclin D1 plays a vital role in the cell cycle progression through phosphorylation of retinoblastoma protein. In parathyroid adenoma, pericentromeric inversion leads to tumor-specific DNA rearrangement between PTH and CCND1 and eventually brings about overactivated translation and overexpression of cyclin D1. This genetic abnormality is detected in approximately 8% of sporadic parathyroid adenoma, and the overexpression of CCND1 is seen in 20-40% of the cases.[1]

CASE REPORT

A 33 years old female patient presented to OPD with chief complaints of chronic fatigue, bony pain, difficulty in walking and abnormal gait since 7 years, not associated with any trauma, fever or weight loss. Routine Blood investigations were serum calcium: 12.1 mg/dl (Normal range: l-8.6-10.2 mg/dl), serum phosphorus- 2.2 mg/dl (normal range: 2.5-4.5 mg/dl), serum parathyroid hormone- 1050 pcg/ml (normal range: 10-55 pcg/ml), and serum vitamin D3- 114 nmol/l (normal range: 75-250 mg/dl). Physical examination of neck and abdomen reveals no significant abnormality. No history of any surgical intervention. No history of trauma, fever and weight loss. MRI pelvis with bilateral hip joints is suggestive of bilateral superior pubic rami fractures. CT neck is suggestive of approximately (10×8×10 mm) (AP×ML×SI)

sized well defined soft tissue density lesion noted involving postero-inferior aspect of right lobe of thyroid gland, which appears relatively hypodense compared to thyroid parenchyma on non-contrast scan and shows intense homogenous post contrast enhancement on arterial phase with relative washout on venous phase. Linear undisplaced fracture noted involving body of scapula on left side.

Linear undisplaced fracture noted involving scapular spine on both sides. Old healed fracture noted involving 3rd and 4th ribs on right side. Sestamibi scan (MIBI) is suggestive of abnormal lesion of parathyroid origin in the region of lower half of right lobe of thyroid.[5] Patient underwent right hemithyroidectomy, in which transverse Kocher's incision kept two fingers above the sternal notch. Superior and inferior platysma flaps revised. Muscles of neck sternothyroid and sternohyoid split from midline and retracted laterally. Vessels at the right superior pole of thyroid gland ligated near the gland and cut. Vessels at the right inferior pole of gland ligated and cut. Recurrent Laryngeal nerve identified and preserved. Isthums cut with the right lobes of thyroid and sent for histopathology. Post-operative blood investigations (post-operative day- 0): serum calcium- 9.9 mg/dl (normal range: 8.6-10.2 mg/dl), serum phosphorus- 1.02 mg/dl (normal range: 2.5-4.5 mg/dl), and serum parathyroid hormone- 7.3 pcg/ml (normal range: 10-55 pcg/ml). The pre-operative parathyroid hormone level was >1000 pcg/ml which dropped down to <10 pcg/ml post tumor excision, an 80% fall in PTH levels is suggestive of successful tumor excision.

Post-operative blood investigations (post-operative day 2): serum calcium- 7.1 mg/dl (normal range: 8.6-10.2 mg/dl), serum phosphorus- 1.57 mg/dl (normal range: 2.5-4.5 mg/dl), serum parathyroid hormone- 43 pcg/ml (normal range: 10-55 pcg/ml). Histo-pathological sections of the specimen shows poorly encapsulated neoplasm consisting of tumor cells (chief cells) arranged predominantly in nesting pattern and in sheets separated by fibrovascular stroma. Overall features are suggestive of 'parathyroid adenoma'. Post-operative period remained uneventful, patient had normal voice with bilateral mobile vocal cords and patient was discharged on 3rd post-operative day.

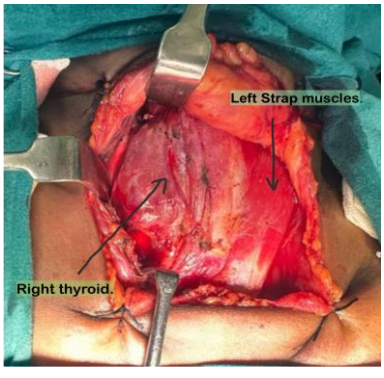

Figure 1: Intra-op picture showing right thyroid gland.

Figure 2: Specimen of right hemi-thyroid gland with isthmus.

Figure 3: 99mTc MIBI scan showing enhanced uptake of sestamibi at right inferior pole of thyroid gland.

DISCUSSION

Parathyroid adenoma is a rare condition. It is a major cause of primary hyperparathyroidism (HPT), which is characterised by an inappropriate excess of parathyroid hormone (PTH) secretion. The elevated PTH levels result in hypercalcemia and hypophosphatemia, with associated medical comorbidities including calculus formation, bone and abdominal pain, polyuria, and depression. Sonography and 99mTc preoperative sestamibi (MIBI) scan are the primary imaging modalities utilized for the visualization of abnormal parathyroid glands. MIBI scan is approximately 90% sensitive for localizing a parathyroid adenoma.[2]

Ultrasonography is the first-line method to be used because it is non-invasive, convenient and an inexpensive investigation. Parathyroid adenomas are nearly always homogeneously hypoechoic to the overlying thyroid gland on gray-scale imaging and are commonly detected using gray-scale imaging alone when they are larger than 1 cm in diameter.[3] 99mTc-MIBI t61 can be considered to be the first choice in diagnosing hyperparathyroidism as this examination produce a valuable data in locating the site of

a tumor before operation. Sestamibi is taken up by both the thyroid and parathyroid glands, but adenomatous and hyperplastic parathyroid tissue shows more avid uptake of the radiotracer and often retains the radiotracer longer than adjacent thyroid tissue.[6]

In centres where minimally invasive parathyroidectomy is not available, open hemithyroidectomy is a good option for the management of primary hyperparathyroidism secondary to parathyroid adenoma. Success is defined using the Miami criteria: a fall in PTH level of >50% at 10 min post-excision compared to baseline (pre-operative).[9]

CONCLUSION

In cases of primary hyperparathyroidism secondary to parathyroid adenoma, confirmed by biochemical and radiological investigations, surgical excision of parathyroid gland is the treatment of choice.

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REFERENCES

1. Prihantono P, Palinggi E, Haryasena H, Hamdani W, Binekada IMC. Surgical Treatment for Parathyroid Adenoma: A Case Report. Open Access Maced J Med Sci. 2019;7(15):2497-2501.
2. Kantharia SR, Kantharia RA, Reddy PK, Mistry YM. Parathyroid adenoma: a case report. Int J Otorhinolaryngol Head Neck Surg. 2020;6:1533-7.
3. Johnson NA, Tublin ME, Ogilvie JB. Parathyroid imaging: technique and role in the preoperative evaluation of primary hyperparathyroidism. AJR Am J Roentgenol. 2007;188(6):1706-15.
4. Khan AA, Khatun Y, Walker A, Jimeno J, Hubbard JG. Role of intraoperative PTH monitoring and surgical approach in primary hyperparathyroidism. Ann Med Surg (Lond). 2015;4(3):301-5.
5. Erickson LA. Atlas of Endocrine Pathology: Atlas of Anatomic Pathology. Springer. 2014:121130.
6. Clark PB, Perrier ND, Morton KA. Detection of an intrathymic parathyroid adenoma using single-photon emission CT 99mTc sestamibi scintigraphy and CT. AJR Am J Roentgenol. 2005;184(3):S16-8.
7. Smith JR, Oates ME. Radionuclide imaging of the parathyroid glands: patterns, pearls, and pitfalls. Radiographics. 2004;24(4):1101-15.
8. Kantharia SR, Kantharia RA, Reddy PK, Mistry YM. Parathyroid adenoma: a case report. Int J Otorhinolaryngol Head Neck Surg 2020;6:1533-7.
9. Lorberboym M, Minski I, Macadziob S, Nikolov G, Schachter P. Incremental diagnostic value of preoperative 99mTc-MIBI SPECT in patients with a parathyroid adenoma. J Nucl Med. 2003;44(6):904-8.

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