International Journal of Otorhinolaryngology and Head and Neck Surgery
Vybhavi MK et al. Int J Otorhinolaryngol Head Neck Surg. 2023 Aug;9(8):677-681
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20232229

Case Report

A case of right parathyroid adenoma and its management

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Received: 15 May 2023
Revised: 23 July 2023
Accepted: 24 July 2023

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ABSTRACT

A 33 year old female patient presented with history of body and joint pain with easy fatiguability unable to perform her routine daily activities since 2 months. She also gave history of recurrent urinary tract infections, pain abdomen, loss of appetite and loss of weight. Examination of neck showed no palpable mass. Laboratory data revealed elevated serum calcium levels and parathyroid hormone levels. Contrast enhanced computed tomography of neck showed well-defined soft tissue density lesion measuring 2.6×1.9×1.6 cm in the postero inferior aspect of right lobe of thyroid suggestive of right parathyroid adenoma. Parathyroid imaging (SPECT) 99mTc-MIBI showed focal increased tracer uptake in relation to inferior aspect of right lobe of thyroid gland. NCCT KUB showed bilateral non obstructive renal calculi with medullary nephrocalcinosis. Patient underwent surgical resection under general anesthesia and histopathology confirmed parathyroid adenoma. Following surgery, parathyroid hormone and calcium levels gradually returned to normal levels. Parathyroid adenoma shows excellent prognosis with complete surgical resection.

Keywords: Parathyroid adenoma, Primary hyperparathyroidism, Surgical resection

INTRODUCTION

Parathyroid glands secrete parathyroid hormone which helps in the regulation of calcium homeostasis.[1] Based on etiology, hyperparathyroidism can be primary, secondary/ tertiary resulting in excess parathyroid hormone secretion.[2] Parathyroid adenoma is the most common tumour (80-85%) causing primary hyperparathyroidism.[1,3] Clinical features of hypercalcemia are commonly noted in patients with primary hyperparathyroidism. Laboratory and radiological investigations are necessary to arrive at a correct diagnosis. Histopathologic confirmation following surgical resection of parathyroid adenoma is essential. We report a case of right parathyroid adenoma and its surgical management.

CASE REPORT

A 33 year old woman was referred to ear, nose and throat out patient department with history of pain abdomen and recurrent urinary tract infections since 2 months. She gave history of body pain and joint pain (Bilateral knees and right shoulder), loss of appetite, loss of weight with history of easy fatiguability since 2 months. She also gave history of nausea, vomiting and loose stools since 1 week. There was no history of fever, breathlessness, confusion, altered mental status. On general physical examination, patient was poorly built and nourished. Examination of neck was normal with no palpable mass.

Laboratory data revealed elevated serum total calcium levels-13.8 mg/dl (9-11 mg/dl) and serum ionized calcium levels-6.85 mEq/l (4.6-5.3 mEq/l). Parathyroid hormone levels were elevated to 189.60 pg/ml (12-95 pg/ml). Ultrasonography of neck showed a well-defined moderate sized oval hypoechoic solid mass lesion measuring 2.7×1.4×1.7 cm noted posteriorly and inferiorly to the right lobe of thyroid gland with significant internal and peripheral vascularity indicative of right parathyroid adenoma. Thyroid gland was found to be normal.

Contrast enhanced computed tomography of neck showed a well-defined soft tissue density lesion measuring 2.6×1.9×1.6 cm in the postero inferior aspect of right lobe of thyroid to bifurcation of right subclavian artery and right common carotid artery suggestive of right parathyroid adenoma. The lesion showed heterogeneous enhancement on arterial phase, washout was seen on venous/delayed phase.

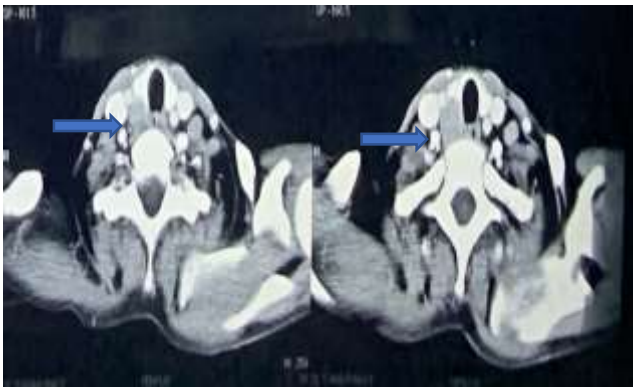

Figure 1: CECT neck showing lesion on the right side in axial view.

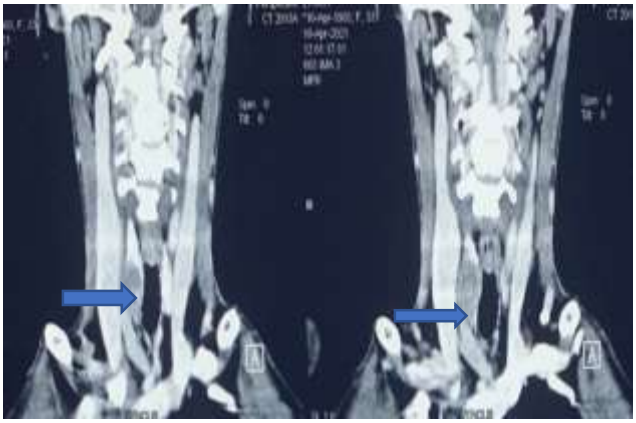

Figure 2: CECT neck showing lesion on the right side in coronal view.

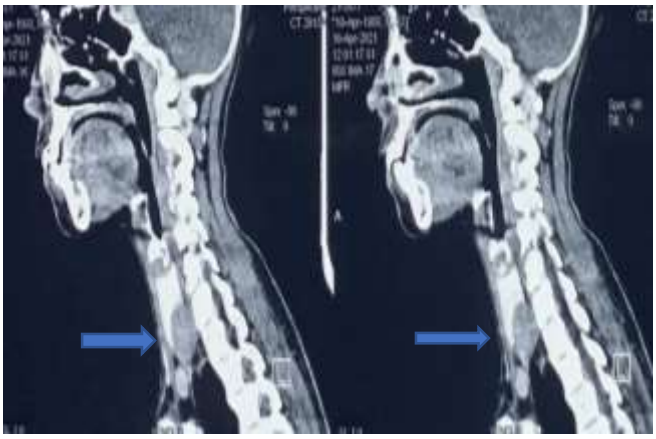

Figure 3: CECT neck showing lesion on the right side in sagittal view.

USG of abdomen showed bilateral renal medullary nephrocalcinosis. Multiple calculi were noted on non-contrast computed tomography kidney ureter bladder (NCCT KUB), largest measuring 5.8 mm in interpolar region and 6.5 mm in lower pole in right and left kidney respectively. Clusters of tiny calcifications were noted in bilateral kidneys at the corticomedullary junctions. Based on NCCT KUB, concluded that patient had bilateral non obstructive renal calculi with medullary nephrocalcinosis.

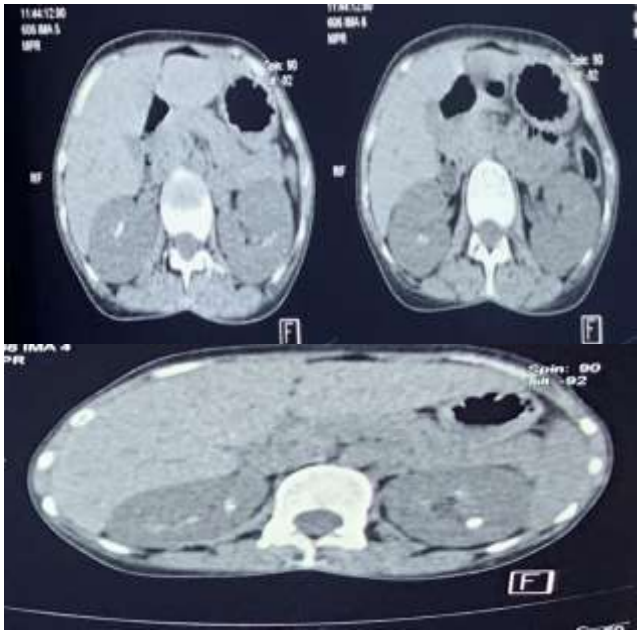

Figure 4: NCCT KUB of bilateral medullary nephrocalcinosis.

Parathyroid imaging (SPECT) 99mTc- MIBI scan-inhomogenous tracer uptake was noted in both lobes of thyroid gland on initial images with focal increased tracer uptake in relation to inferior aspect of right lobe of thyroid gland. Delayed images show significant retention of tracer in relation to right lower lobe of thyroid gland. Scan findings are likely parathyroid adenoma in relation to right lower lobe of thyroid gland.

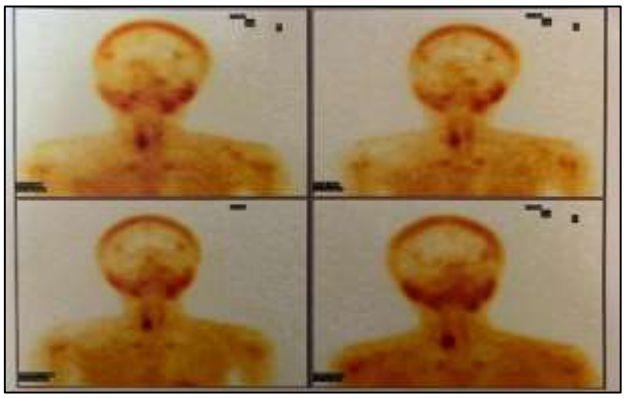

Figure 5: Technetium 99m MIBI scintigraphy showed retention of tracer in relation to right lower lobe of thyroid gland.

Patient underwent initial conservative management with intravenous fluid resuscitation, intravenous bisphosphonate therapy (Inj zoledronic acid 4 mg in 100 ml NS IV stat), intravenous loop diuretic treatment (Inj lasix 20 mg 1-1-0×3 days) and Inj calcitonin 100 IU 1-0-0 for 3 days. Tab cinacalcet 30 mg once a day in the morning was prescribed for 1 week. Following medical optimization, patient was planned for surgical resection of right parathyroid adenoma under general anesthesia.

A transverse collar incision (6-8 cm) was given in the lower skin crease of neck. Subplatysmal flaps were elevated. Following incision of investing layer of deep cervical fascia, strap muscles were retracted medially and sternocleidomastoid muscle retracted laterally. Paracarotid space was visualized and carotid sheath identified. Tumour was visualized and found attached to the posterior surface of right lobe of thyroid gland. No clear demarcation was seen between the parathyroid tumour and the right lobe of thyroid gland. Hence, it was decided to remove the right lobe of thyroid along with the tumour. Right internal carotid artery, inferior thyroid artery, recurrent laryngeal nerve were identified and secured. Following inferior pedicle and superior pedicle ligation, resection of the surgical specimen was done and sent for histopathological examination. Wound was closed in layers and patient was extubated.

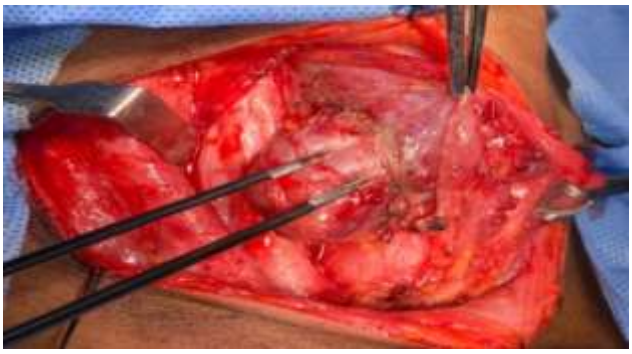

Figure 6: Intraoperative picture of right inferior parathyroid tumour attached to the posterior surface of the right lobe of thyroid gland.

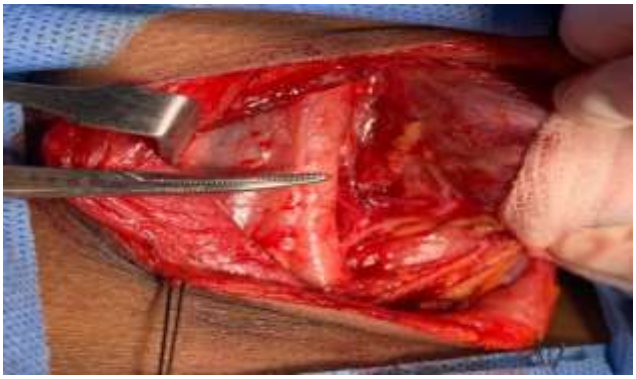

Figure 7: Intraoperative picture of right internal carotid artery, inferior thyroid artery and recurrent laryngeal nerve.

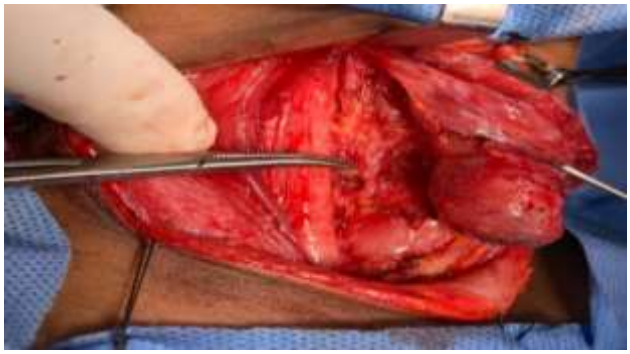

Figure 8: Intraoperative picture of right recurrent laryngeal nerve which was secured.

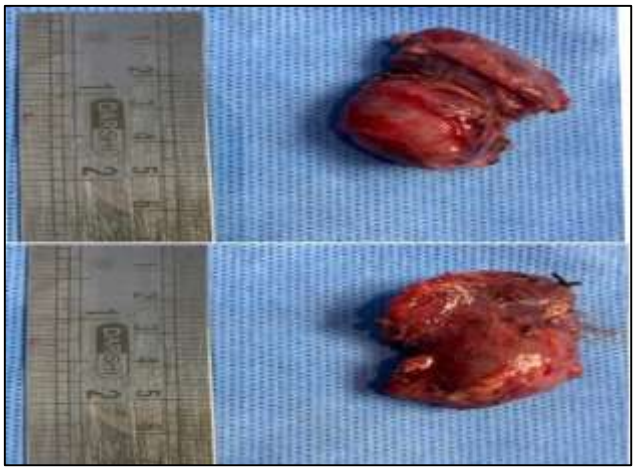

Figure 9: Anterior and posterior view of resected specimen.

HPE showed well encapsulated lesion composed of cells arranged in cords, trabecular and follicular pattern separated by thin-walled blood vessels. Round cells with abundant eosinophilic granular cytoplasm and bland chromatin was noted. Adjacent normal thyroid tissue was seen. There was no evidence of atypia/ malignancy seen. Diagnosis of parathyroid adenoma was confirmed. Postop period was uneventful. Parathyroid hormone levels reduced to normal range after surgery. Patient had no complaints on 1 year follow up after surgery.

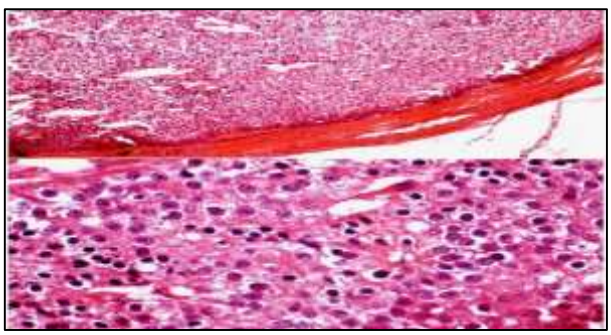

Figure 10: Histopathology of a well encapsulated lesion of parathyroid adenoma, tumour cells with round to ovoid nuclei with densely stained chromatin.

DISCUSSION

Parathyroid adenomas are the most common cause of primary hyperparathyroidism. Review of literature shows a female preponderance of primary hyperparathyroidism with reported incidence of 2.5/1000 individuals in India.[4] The clinical features of hypercalcemia are more often manifested in patients of primary hyperparathyroidism. The classic pentad of hypercalcemia features includes kidney stones, fatigue overtones, abdominal groans, painful bones and psychic moans.[5,6]

According to a systematic review on primary hyperparathyroidism in India (344 cases), 36% prevalence of renal disease was reported. Review of literature shows presence of renal calculi and nephrocalcinosis in 40.5% of the primary hyperparathyroidism patients and as a presenting complaint in 15.1% of the patients.[7] The same clinical feature was noticed as a presenting complaint in our patient as well. Depending on the size, parathyroid tumours may be visible and palpable clinically. Giant parathyroid adenomas weighing more than 3.5 gm usually present with visible and palpable neck masses.[8]

Laboratory investigations for parathyroid gland tumours start with serum calcium and serum parathyroid hormone levels and proceed to imaging for localization. Hypercalcemia and elevated parathyroid hormone levels are hallmarks of primary hyperparathyroidism. Review of literature shows a positive correlation between the size of parathyroid adenomas and preoperative parathyroid hormone levels.[9]According to a study by Calva-Cerqueira et al, there is a 95% chance of finding a parathyroid adenoma weighing more than 250 mg if preoperative parathyroid hormone levels are more than 232 ng/l.[10]

Ultrasonography of neck and 99mTe-sestamibi scintigraphy are the primary imaging modalities utilized for the visualization of diseased parathyroid glands.[11] Normal parathyroid glands are too small to be visualized on imaging, but when enlarged they can be easily detected. Combining ultrasound, MIBI and CT increases the accuracy of localization to 82%.[12] Contrast enhanced CT and MRI scan can also be used to determine the location of ectopic parathyroid adenomas.[13] Ultrasonography and CT neck revealed an inferior right parathyroid mass in this patient suggestive of an adenoma. Ultrasonography of abdomen helps in detecting renal calculi and other abnormalities in the kidneys.

Review of literature supports an early excision after a period of medical optimization, rather than emergency surgery. Appropriate medical management prior to surgical excision is associated with low mortality rates. Intravenous bisphosphonate therapy and loop diuretic therapy along with fluid resuscitation helps in reduction of serum calcium levels.[14] The preferred treatment of parathyroid tumours is surgical exploration of neck and removal of the pathological parathyroid gland. The surgical specimen is always sent for histopathological examination. Postoperative hypocalcemia is corrected with calcium repletion therapy.[15]

CONCLUSION

In conclusion, parathyroid adenoma should always be suspected in patients with hypercalcemia and elevated parathyroid hormone levels. With appropriate preoperative diagnostic and imaging studies, parathyroid adenoma can be detected early and shows excellent prognosis with surgical treatment.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Vybhavi MK, Prashanth V, Muddaiah D, Srinivas V. A case of right parathyroid adenoma and its management. Int J Otorhinolaryngol Head Neck Surg 2023;9:677-81.