Section: General Medicine

Case Report

PARATHYROID ADENOMA WITH SYSTEMIC MANIFESTATIONS: DIAGNOSTIC INSIGHT FROM 18F-CHOLINE PET-CT

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ABSTRACT

Primary hyperparathyroidism (PHPT) is an endocrine disorder characterized by excessive secretion of parathyroid hormone (PTH), resulting in hypercalcemia and multi-system involvement. Parathyroid adenoma remains the most frequent etiology. We present a rare case of parathyroid adenoma in a 55-year-old woman presenting with recurrent abdominal pain, vomiting, and laboratory evidence of hypercalcemia and pancreatitis. Biochemical evaluation confirmed elevated PTH levels, and localization was achieved using 18F-Choline PET-CT, a novel and highly sensitive imaging modality rarely employed in routine practice. This case highlights the significance of advanced imaging in atypical presentations of PHPT and the importance of multidisciplinary management.

Keywords: Parathyroid adenoma, Hyperparathyroidism, 18F-Choline PET-CT, Hypercalcemia, Pancreatitis, Nephrolithiasis.

INTRODUCTION

Primary hyperparathyroidism (PHPT) is one of the most common causes of hypercalcemia in the outpatient setting. It predominantly affects postmenopausal women and is most often caused by a single parathyroid adenoma (80–85% of cases). Excess secretion of PTH increases serum calcium levels through bone resorption, renal tubular reabsorption of calcium, and increased intestinal absorption. Clinical manifestations can range from being asymptomatic to involving bones ('stones, bones, groans, and psychic overtones'). Pancreatitis, though uncommon, can occur as a result of hypercalcemia-induced activation of pancreatic enzymes. Traditional imaging modalities such as neck ultrasonography and Tc-99m sestamibi scans are used to localize the lesion, but novel techniques such as 18F-Choline PET-CT have shown superior sensitivity, especially in small, ectopic, or complex cases.

Case Presentation

A 55-year-old female presented with diffuse abdominal pain for 20 days and recurrent vomiting for 3 days. The pain was sharp, radiating to the back, and associated with multiple non-bilious vomiting episodes. There was no history of fever or bowel disturbances. She had previously undergone laparoscopic renal stone surgery (10 years ago), hysterectomy (8 years ago), and cholecystectomy (7 years ago). There was no history of diabetes mellitus, thyroid disease, or tuberculosis.

On examination, she was afebrile, with a blood pressure of 128/78 mmHg, pulse rate of 104 bpm, and SpO_2 of 97% on room air. Abdomen was soft with tenderness in the left hypochondrium and lumbar regions. Systemic examination was otherwise unremarkable.

INVESTIGATIONS

Table 1: Summary of Biochemical Investigations

Parameter	Finding	Reference Range	Interpretation
Serum Calcium	13.3 mg/dL	8.5–10.5	Marked Hypercalcemia
Serum Phosphorus	2.4 mg/dL	2.5–4.5	Low-normal
PTH (Intact)	205.5 pg/mL	13.6–85.8	Significantly Elevated
ALP	324 U/L	38–126	Raised

Lipase	3541 U/L	23–300	Severe Elevation (Pancreatitis)
Amylase	826 U/L	30–110	Elevated
Creatinine	1.9 → 0.6 mg/dL	0.52–1.04	Improved with Hydration
CRP	39.68 mg/dL	<1	Marked Inflammatory Response

IMAGING FINDINGS

CECT Neck (06/10/2025) revealed an enhancing lesion in the anteroinferior aspect of the left thyroid lobe (~10×6 mm), suggestive of a parathyroid adenoma.

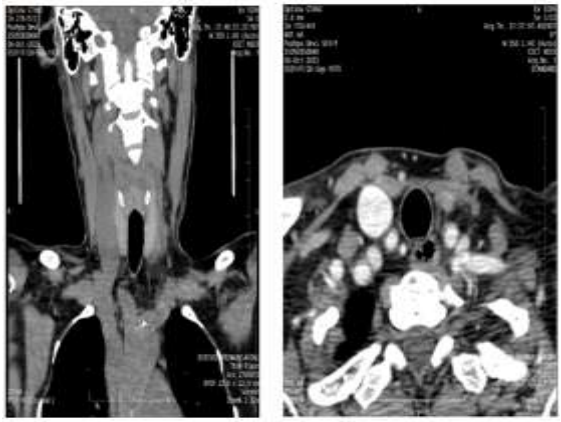


Figure 1: CECT neck showing enhancing left inferior parathyroid lesion with feeding vessel

18F choline PET CT (15/10/2025) demonstrated a focal avid lesion at the lower pole of the left thyroid lobe (approx. 1.0×0.7 cm) with progressive delayed uptake (SUVmax up to ~5.7), highly suggestive of parathyroid adenoma; no other abnormal uptake was noted elsewhere.

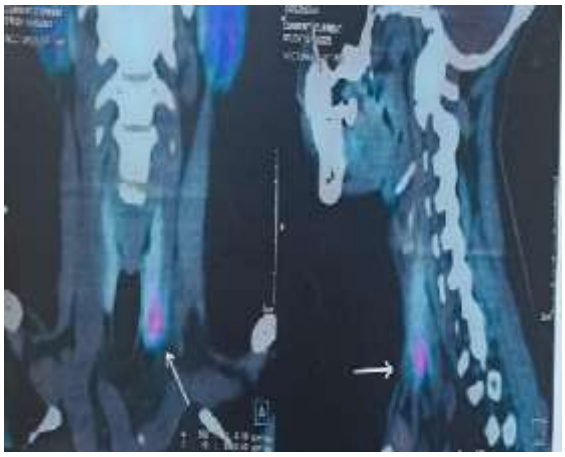
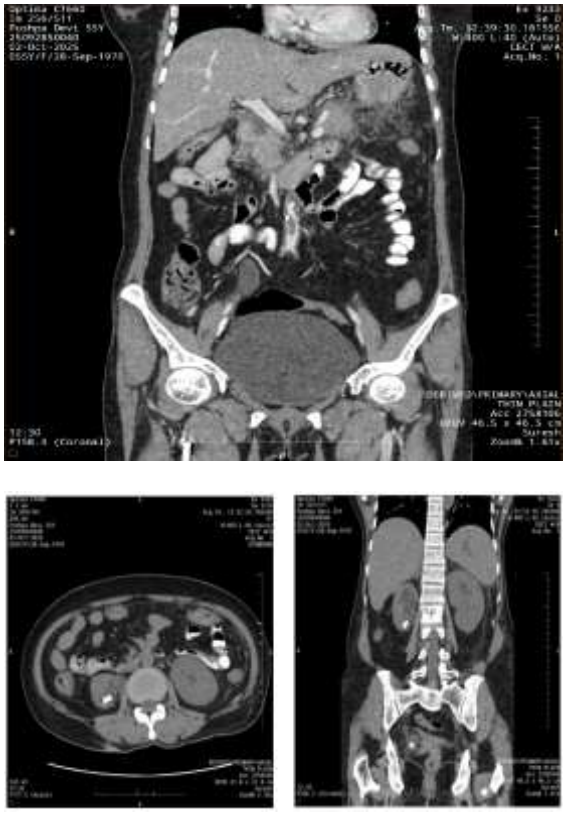


Figure 2: 18F choline PET CT demonstrating focal uptake at the left inferior parathyroid gland (arrows)

CECT Whole Abdomen (02/10/2025): Chronic calcific pancreatitis with multiple calcified foci within the pancreas, right renal and vesicoureteric junction calculi with moderate hydroureteronephrosis, and atherosclerotic plaques in the abdominal aorta.



(Figure 3: CECT Abdomen showing atherosclerotic plaques in the abdominal aorta, calcific pancreatitis and renal calculi)

Management and Outcome

The patient was initially managed conservatively in the ICU with IV fluids, analgesics, and antibiotics. Hypercalcemia was treated with IV zoledronic acid (4 mg) and adequate hydration. After stabilization, she underwent detailed imaging evaluation that confirmed the diagnosis of parathyroid adenoma. She was referred for parathyroidectomy to a tertiary endocrine surgery center. At discharge, her calcium levels normalized and symptoms subsided.

DISCUSSION

Primary hyperparathyroidism (PHPT) is a relatively underdiagnosed cause of recurrent abdominal pain and pancreatitis. The prevalence of PHPT ranges between 0.1%–0.4% in the general population, with women affected three times more than men. Chronic hypercalcemia leads to ectopic calcifications, nephrolithiasis, and pancreatitis due to calcium-induced activation of pancreatic enzymes. Diagnosis relies on elevated serum calcium and PTH with low or normal phosphate.

Localization of the adenoma is critical for surgical planning. While ultrasonography and sestamibi scans remain first-line, 18F-Choline PET-CT has emerged as a superior modality, particularly in re-operative or

inconclusive cases. It offers higher resolution and specificity. Studies have demonstrated sensitivity above 90% for single-gland disease, outperforming conventional scintigraphy.[1-3]

In this patient, the 18F-Choline PET-CT confirmed a small left inferior parathyroid adenoma not easily delineated on ultrasound. This illustrates its growing role as a valuable adjunct in diagnosing PHPT, especially in atypical systemic presentations such as pancreatitis.

CONCLUSION

This case emphasizes that parathyroid adenoma can present with non-classical systemic features such as pancreatitis and nephrolithiasis. 18F-Choline PET-CT provides precise localization when conventional imaging is inconclusive. Early diagnosis and surgical excision can reverse systemic complications.

Clinical Message

Parathyroid adenoma should be suspected in patients with unexplained hypercalcemia, pancreatitis, or renal calculi. 18F-Choline PET-CT is an emerging tool for accurate localization and should be considered when standard imaging fails.

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