Section: General Medicine

Case Report

PRIMARY HYPERPARATHYROIDISM: AN INCIDENTAL FINDING IN CASE OF LEFT INTERTROCHANTARIC FRACTURE

Sahil Nain[1], Vipul Goyal[1], Lavish Singla[1], Ravinder Singh Ahlawat[2], Deepak Singla[1], Esha Singhal[3], Suresh Babu Gupta[2], Deepak Sharma[4]

[1]*Junior Resident, Department of General Medicine, School of Medical Sciences and Research (SMSR), Sharda University, Greater Noida, Uttar Pradesh, India*
[2]*Professor, School of Medical Sciences and Research (SMSR), Sharda University, Greater Noida, Uttar Pradesh, India*
[3]*Associate Professor, School of Medical Sciences and Research (SMSR), Sharda University, Greater Noida, Uttar Pradesh, India*
[4]*Professor and Head Department of General Medicine, School of Medical Sciences and Research (SMSR), Sharda University, Greater Noida, Uttar Pradesh, India*

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Corresponding Author:
Dr. Lavish Singla,
Junior Resident, Department of General Medicine, School of Medical Sciences and Research (SMSR), Sharda University, Greater Noida, Uttar Pradesh, India.
Email: lavishsingla2@gmail.com

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ABSTRACT

Primary Hyperparathyroidism has become a common endocrine disorder which develops due to excessive secretion of parathyroid hormone which leads to hypercalcemia. The incidences of Primary hyperparathyroidism (PHPT) have increased exponentially over the past couple of decades. The patient in higher age groups are more vulnerable as the condition is very hard to diagnose in the early stages due to its asymptomatic nature. Though classical manifestations include bone pain, nephrolithiasis, and gastrointestinal issues, neuropsychiatric symptoms are increasingly recognized. In the present case study, an 82 year old male who had undergone open reduction and internal fixation (ORIF) for femur fracture complained of drowsiness and constipation. The electrocardiogram (ECG), urine analysis correlated with the presentation of PHPT. Further investigations confirmed the differential diagnosis of parathyroid adenoma. The initial treatment was focused on lowering the blood calcium level. Furthermore, the patient was advised to strictly modify their diet by restricting consumption of phosphorous rich foods such as dairy, nuts, legumes and meat products. Upon follow up, Central Nervous System (CNS) Symptoms and Gastrointestinal Tract (GIT) symptoms were improved post hypercalcemia correction and the patient was again scheduled to follow-up for hypercalcemia and hyperparathyroidism. Elderly patients may manifest non-specific systemic complaints that delay diagnosis. Early identification of PHPT through biochemical screening and imaging is crucial to prevent complications such as fractures, renal dysfunction, or cognitive decline. This case reinforces the need to consider PHPT in the differential diagnosis of hypercalcemia, especially in older adults with unexplained systemic symptoms.

Keywords: Primary hyperparathyroidism, hypercalcemia, pathological fractures, parathyroid adenoma.

INTRODUCTION

With the increased awareness about health and easily accessible investigations, the incidences of conditions such as Primary Hyperparathyroidism have increased. The ageing population has also significantly increased the number of cases reported.[1] Primary hyperparathyroidism is relatively asymptomatic which made it harder to diagnose in the early stages decades ago. It is an endocrine disorder which causes higher than normal levels of secretions of parathyroid hormone leading to hypercalcemia.[2] PTH is ranked third most common disorder after thyroid related ailments and diabetes which are caused to endocrine glands. The increased concentration of calcium in the blood can eventually cause renal disfunction, weaken the bones and malfunctioning of the heart.[3] Neuropsychiatric

manifestations are recognized clinical features of primary hyperparathyroidism. Severe symptoms such as depression, anxiety, fatigue, cognitive impairment, memory disturbances, and related psychological dysfunctions can be seen in some patients.[4] Parathyroid adenoma is a benign tumour that is found on the parathyroid glands which can cause the glands to overproduce the parathyroid hormone leading to parathyroidism.[5]

The present case is a rare scenario as instead of classical bone or renal manifestations, the patient presented with altered sensorium and constipation, which are atypical and often under-recognized features of hypercalcemia secondary to PHPT. The fracture and reduced bone density may be a consequence of prolonged undiagnosed PHPT, showing a subtle skeletal involvement not picked up early.

History of presenting illness: This case report describes the clinical presentation of an 82-year-old male. The patient was complaining of drowsiness and constipation. The patient later presented with a complex clinical picture, exhibiting central nervous system (CNS) symptoms specifically altered sensorium and gastrointestinal (GIT) manifestations, suggesting a multifactorial or systemic underlying pathology that warranted further evaluation.

Past Medical History: The patient had undergone open reduction and internal fixation (ORIF) with intramedullary nailing for a left intertrochanteric femur fracture [Figure 2].

Physical Examination Findings: Initial Investigations: ECG report revealed shortened QT intervals which further supported the hypothesis of parathyroidism [Figure 1]. In addition to the aforementioned findings, the urine phosphate levels were also low suggesting increased renal reabsorption of phosphate.

These symptoms are typically found in patients with conditions such as hyperparathyroidism, metabolic disorders or endocrine etiology. Upon further investigations, hypercalcemia combined with hyperparathyroidism were confirmed [Table 1].

Further Investigations: The patient was advised for a Contrast-Enhanced Computed Tomography (CECT) to assess the situation further. CECT neck revealed the presence of parathyroid adenoma, a well defined, oval shaped lesion posteromedial to the right lobe of thyroid gland at the level of TI vertebral body.

Differential diagnosis: Initially Multiple Myeloma, Vit D intoxication, Hyperthyroidism, Familial Hypocalceuric Hypercalceuria, Parhthyroid Carcinoma. High iPTH and Hypercalcemia and CECT neck findings suggestive of parathyroid adenoma [Figure 3].

Treatment: Based on the investigations, the patient was advised to follow up for hypercalcemia and hyperparathyroidism. The treatment regime required to increase the excretion of calcium through urine by volume restoration expansion and saline diuresis. The patient was injected with:

A) Inj. Calcitonin 200 I/u s/c twice a daily.
B) Inj. Zolindronate 4 mg I/v single dose.
C) Inj Hydrocort 100 mg I/v 8 hourly.

The patient was advised to strictly modify their diet by restricting consumption of phosphorous rich foods such as dairy, nuts, legumes and meat products. Upon follow up, CNS Symptoms and GIT symptoms were improved post hypercalcemia correction and the patient was again scheduled to follow-up for hypercalcemia and hyperparathyroidism.

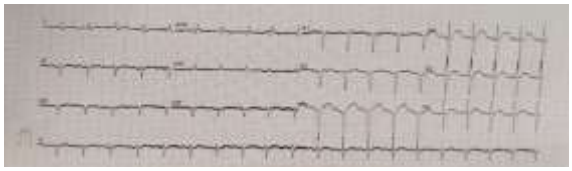

Figure 1: ECG showing shortened QT interval consistent with hypercalcemia.

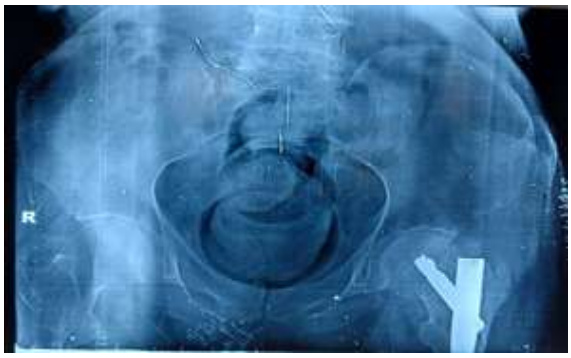

Figure 2: Radiograph of the pelvis (AP view) showing left intertrochanteric femur fracture status post internal fixation.

Table 1: Investigations

Parameter	Observed Value	Normal Range
Hemoglobin (Hb)	9.70 g/dL	Male: 13.5–17.5 g/dL; Female: 12–15.5 g/dL
Serum Albumin	2.80 g/dL	3.4–5.4 g/dL
Serum Calcium	12.90 mg/dL	8.5–10.5 mg/dL
Corrected Calcium	13.86 mg/dL	8.5–10.5 mg/dL
Serum Phosphate	3.70 mg/dL	2.5–4.5 mg/dL
Vitamin D (25(OH)D)	17.3 ng/mL	30–100 ng/mL
Triiodothyronine (T3)	2.53 pg/mL	2.0–4.4 pg/mL
Thyroxine (T4)	1.21 ng/dL	0.9–2.3 ng/dL
Thyroid Stimulating Hormone (TSH)	2.89 µIU/mL	0.4–4.0 µIU/mL
Intact Parathyroid Hormone (iPTH)	446.70 pg/mL	15–65 pg/mL
Serum Protein Electrophoresis	No M-band seen	No monoclonal band (normal)
Urinary Phosphorus	0.1 g/day	0.4–1.3 g/day or 13–42 mmol/day
Carcinoembryonic Antigen (CEA)	1.68 ng/mL	<5 ng/mL (non-smoker); <2.5 ng/mL (smoker)
Alpha-Fetoprotein (AFP)	1.11 ng/mL	<10 ng/mL

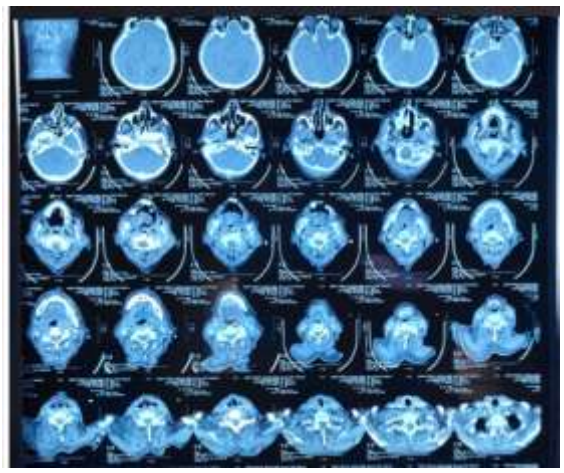

Figure 3: The image displays a series of axial cross-sectional scans from a CECT of the neck. (A well defined, oval shaped, hypodense (HU- 15 to 20) lesion of size ~ 24.4 x 14.5 x 20.2 mm (APxTRxCC) is seen posteromedial to the right lobe of thyroid gland at the level of TI vertebral body. On posteontrast study, the lesion is showing peripheral enhancement with early central washout. Positive 'Polar vessel sign' is seen. (Polar vessel is seen in the superior aspect of the lesion).

DISCUSSION

Primary hyperparathyroidism (PHPT) many times goes undetected, particularly in the older population, as it presents itself with varying symptoms. In the present case study, an 82 year old male Indian Patient was experiencing altered sensorium and constipation. These symptoms are not typically associated with PHPT. These findings draw attention to the need for greater awareness of non-classical presentations, particularly in older patients where symptoms may be mistaken for age-related conditions.

The biochemical investigations revealed noteworthy hypercalcemia combined with higher levels of parathyroid hormone (iPTH) along with low phosphate in urine.[6] Low vitamin D levels were seen in the patient corresponding with low calcium absorption leading to hyperactive parathyroid gland. Low levels of albumin was also recorded in the blood leading to hypoalbuminemia along with mild anemia which could be caused by malnutrition, chronic disease or PHPT in older people. Gonmei et al., 2018,[7] also reported 57.76% elderly had anemia.

Along with this, the shortened QT interval as noticed on the ECG which supports the diagnosis. Through a contrast enhanced CT, a parathyroid adenoma was identified, confirming the hypothesis. Although the patient had a previous femur fracture, it likely resulted from long-term undiagnosed PHPT weakening his bones a consequence often overlooked until such complications arise.

Interestingly, the patient's symptoms related to neuropsychiatry and gastrointestinal symptoms improved soon after the levels of calcium were balanced. This further confirmed the hypothesis of hypercalcemia being the underlying cause.

To lower calcium levels, intravenous saline corrects dehydration and promotes renal excretion. Loop diuretics can be used after hydration to enhance calcium loss. Bisphosphonates like pamidronate or zoledronic acid inhibit bone resorption, especially in cancer cases. Calcitonin provides quick but short-lived calcium reduction. Denosumab is effective in bisphosphonate-resistant cases. Glucocorticoids help reduce calcium absorption in vitamin D-related hypercalcemia. Patient was initially given saline and diuretics to reduce hypercalcemia followed by calcium lowering drugs to remove the calcium from the body like zoledronic acid and calcitonin.

Such symptoms are increasingly recognized in recent literature, particularly in older individuals who are more vulnerable to subtle systemic effects. Baig et al,[8] 2018 have reported a hip fracture in a 77 year old female due to primary parathyroidism. In another study by Khaoula et al,[9] 2011 also reported similar case in a 55 year old female with right femur fracture. The histopathological evaluation confirmed the presence of a brown tumor associated with primary hyperparathyroidism. Another report stated a fracture of clavicle in a 50 year old male by Benameur et al., 2017.[10]

Primary Hyperparathyroidism can be accounted for with the symptoms including kidney stones, osteoporotic fractures, parathyroid adenoma, parathyroid hyperplasia and very rarely due to parathyroid carcinoma.

At the time of admission, other possible diagnoses such as multiple myeloma, thyroid dysfunction, or malignancy were considered. These were systematically ruled out, allowing for timely and focused treatment. The therapeutic approach, which included intravenous hydration, calcitonin, and zolindronate, successfully reduced serum calcium levels. The patient's response to treatment and improvement in symptoms further affirmed the diagnosis.

This case illustrates the need for clinicians to consider PHPT in patients with unexplained calcium imbalance and systemic complaints, especially when classical signs are absent. Early recognition and intervention can prevent complications like fractures, kidney stones, and cognitive decline. Overall, this case emphasizes the importance of a comprehensive diagnostic process in older adults and the role of endocrine disorders in causing seemingly unrelated symptoms.

CONCLUSION

This case underscores the importance of recognizing primary hyperparathyroidism (PHPT) as a potential cause of atypical presentations such as altered sensorium, constipation, and pathological fractures in elderly patients. Clinicians should maintain a high index of suspicion and include serum calcium and parathyroid hormone estimation in the evaluation of unexplained systemic or neuropsychiatric symptoms.

Early diagnosis and prompt correction of hypercalcemia through hydration, diuretics, calcitonin, and bisphosphonates are critical to prevent complications, while definitive management by parathyroidectomy should be considered once stabilized. This case reinforces the clinical learning that timely biochemical screening and multidisciplinary management can significantly improve patient outcomes in PHPT.

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