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Severe Primary Hyperparathyroidism Revealed by Hypercalcemic Crisis and Acute Pancreatitis in Late Pregnancy: A Case Report and Multidisciplinary Management Approach

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Abstract **Case Report**

Primary hyperparathyroidism (PHPT) during pregnancy is a rare but potentially life-threatening condition that can lead to severe maternal and fetal complications if unrecognized. We report the case of a 36-year-old pregnant woman at 33 weeks' gestation who presented with acute confusion and was found to have severe hypercalcemia. Further evaluation revealed markedly elevated parathyroid hormone levels, consistent with PHPT, along with acute pancreatitis and extensive osteolytic bone lesions. Due to fetal distress and uterine contractions, an emergency cesarean delivery was performed. The neonate required admission to neonatal intensive care but had a favorable outcome. The mother's hypercalcemia was managed with intensive intravenous hydration, diuretic therapy, hemodialysis, and postpartum administration of zoledronic acid. Imaging revealed a parathyroid adenoma, and endocrinologic workup confirmed severe PHPT with associated vitamin D deficiency. The patient was referred for further investigation to rule out a multiple endocrine neoplasia (MEN) syndrome and to prepare for parathyroidectomy. This case highlights the diagnostic and therapeutic challenges of PHPT during pregnancy, especially when complicated by acute pancreatitis and neuropsychiatric symptoms. It emphasizes the critical need for multidisciplinary collaboration across obstetrics, endocrinology, intensive care, nephrology, neonatology, and surgery. Given the absence of formal obstetric guidelines for PHPT, individualized management strategies based on clinical presentation and gestational age are essential. Early recognition and prompt intervention are key to preventing serious outcomes. This case adds to the limited literature on late-pregnancy PHPT and demonstrates that even severe metabolic emergencies in pregnancy can be successfully managed through vigilant monitoring and coordinated care.

Keywords: Acute Pancreatitis, Intensive Care, Maternal Complications, Multidisciplinary Management, Neonatal Hypocalcemia, Pregnancy, Primary Hyperparathyroidism, Severe Hypercalcemia.

INTRODUCTION

Primary hyperparathyroidism (PHPT) during pregnancy is a rare endocrine disorder associated with significant maternal and fetal risks. Although PHPT is relatively common overall, its occurrence during pregnancy is infrequent and often remains undiagnosed due to nonspecific symptoms such as fatigue, nausea, and weakness, which overlap with normal gestational complaints (Davis & Nippita, 2020). Unrecognized maternal hypercalcemia can lead to severe complications including nephrolithiasis, hyperemesis, pancreatitis, and life-threatening hypercalcemic crisis (Zanardini *et al*., 2020). Fetal complications include miscarriage, intrauterine growth restriction, preterm delivery, and neonatal hypocalcemia due to suppression of fetal parathyroid function (J. Gonçalves *et al*., 2025). Despite its severity, formal obstetric guidelines for managing PHPT in pregnancy remain lacking, emphasizing the importance of timely recognition and treatment based largely on case reports and expert consensus. This case report describes a unique presentation of PHPT in a 36-year-old pregnant woman with severe hypercalcemia, acute pancreatitis, and extensive osteolytic lesions, highlighting the necessity of multidisciplinary collaboration for optimal maternal and neonatal outcomes.

CASE REPORT

A previously healthy 36-year-old female patient, gravida 2 para 1, at 33 weeks of gestation, presented to the Mother-Child Intensive Care Unit of University Hospital Hassan II, Fez, Morocco, with acute confusion. Her pregnancy had been complicated by gestational diabetes managed by dietary measures. She had no notable past medical or surgical history.

The patient's symptoms began 48 hours prior to admission, initially manifesting as premature uterine contractions managed with tocolytic therapy. Subsequently, the patient developed acute confusion concomitant with signs of fetal distress, prompting an emergent cesarean delivery under general anesthesia. A male neonate was delivered and immediately admitted to neonatal intensive care. The neonate showed rapid improvement within 48 hours.

On initial examination post-cesarean, the patient was confused with a Glasgow Coma Scale (GCS) of 13, and vital signs revealed blood pressure of 131/87 mmHg, heart rate of 77 bpm, temperature of 35.7°C, and oxygen saturation of 96% on room air. She exhibited marked abdominal distension with diffuse tenderness upon palpation. Neurological examination revealed no motor or sensory deficits. There were no peripheral edemas.

Initial laboratory investigations demonstrated severe hypercalcemia (corrected calcium 17.2 mg/dL), significantly elevated lipase levels (1200 IU/L), hypokalemia (3.99 mmol/L), and normal renal function parameters. Due to the elevated lipase and clinical suspicion of acute pancreatitis, an abdominal computed tomography (CT) scan was performed, revealing findings consistent with severe acute pancreatitis (grade E according to the Balthazar classification), extensive intra-abdominal fluid collection, and multiple osteolytic lesions involving the vertebral bodies and pelvic bones, raising suspicion for secondary bone metastases or brown tumors associated with primary hyperparathyroidism (Figure 1).

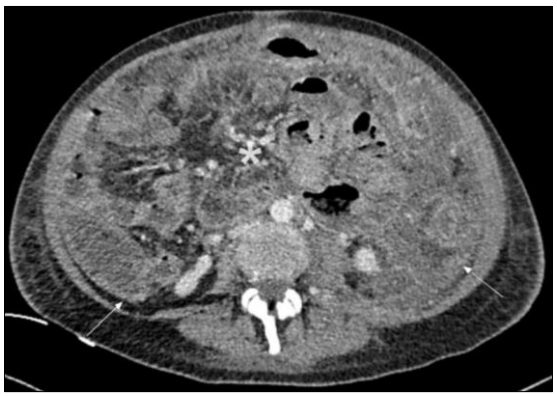

Figure 1: CT scan showing acute pancreatitis Balthazar grade E

Diffuse pancreatic enlargement (asterisk) with peritoneal effusion (arrows).

Further imaging included spinal CT scans confirming extensive osteolytic lesions (Figure 2). Cervical ultrasound revealed a significant hypoechoic nodule suggestive of parathyroid adenoma.

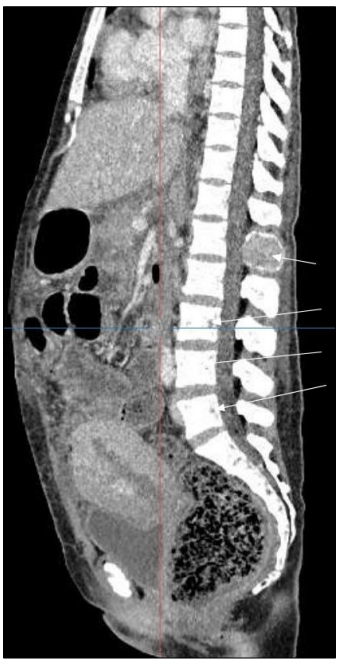

Figure 2: Sagittal CT showing multiple vertebral osteolytic lesions

Sagittal contrast-enhanced CT image of the lumbar spine demonstrating multiple osteolytic lesions (arrows) involving the vertebral bodies, with complete lysis of the posterior arch of L1. These findings are suggestive of brown tumors in the setting of severe primary hyperparathyroidism.

The patient was managed initially with aggressive intravenous hydration using isotonic saline, diuretic therapy with intravenous furosemide, preventive anticoagulation, and proton pump inhibitors for gastric protection. Given the severity of hypercalcemia, she underwent hemodialysis, followed by administration of intravenous zoledronic acid, potassium and magnesium supplementation, and close electrocardiographic monitoring due to prolonged corrected QT interval.

Throughout the ICU stay, the patient's consciousness progressively improved, with GCS normalizing to 15. Hypercalcemia showed a gradual and sustained reduction from an initial corrected calcium level of 17.2 mg/dL down to 15.1 mg/dL following hemodialysis, and subsequently to a stable level of 10.5-11.5 mg/dL post zoledronic acid therapy. The patient developed significant ascites and bilateral pleural effusion, both closely monitored clinically and radiologically (Figure 3). Renal function remained

preserved throughout the hospital stay with sustained adequate urine output.

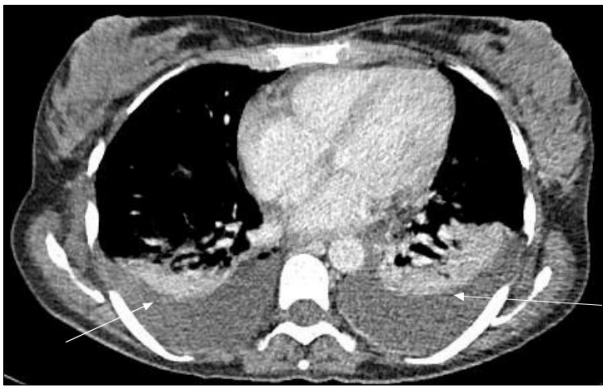

Figure 3: Axial CT showing bilateral pleural effusion

Contrast-enhanced axial CT scan at the thoracoabdominal junction reveals bilateral pleural effusions (arrows), more prominent on the right side.

Subsequent endocrine investigations confirmed severe primary hyperparathyroidism (parathyroid hormone level of 1194 pg/mL) and profound vitamin D deficiency (8.4 ng/mL). She was then transferred to the endocrinology department for continued management, including vitamin D supplementation and preparation for surgical intervention.

Further planned investigations include parathyroid scintigraphy, detailed cervical ultrasound, and osteodensitometry within the framework of a suspected Multiple Endocrine Neoplasia (MEN) syndrome, in coordination with ENT and digestive surgeons for subsequent resection of the parathyroid nodule following the resolution of the acute pancreatitis episode.

Ethical committee approval was obtained for reporting this case.

DISCUSSION

Case Summary

This case illustrates a rare and severe presentation of PHPT diagnosed in late pregnancy. At 33 weeks of gestation, the patient presented with confusion due to a hypercalcemic crisis. Laboratory investigations revealed profoundly elevated serum calcium (~17 mg/dL) and parathyroid hormone (PTH ~1194 pg/mL), confirming PHPT. Complications included acute pancreatitis (lipase 1200 IU/L), extensive osteolytic lesions, and fetal distress, necessitating an emergency cesarean section. The neonate required brief intensive care but had a favorable outcome. Imaging suggested long-standing disease, and the diagnosis was later supported by cervical ultrasound findings suggestive of a parathyroid adenoma. The constellation of encephalopathy, pancreatitis, and skeletal involvement in pregnancy highlights a rare and serious spectrum of PHPT.

Maternal Risks in PHPT during Pregnancy

PHPT during pregnancy is uncommon but associated with significant morbidity. Physiological adaptations, such as increased renal calcium excretion and hemodilution, may initially obscure hypercalcemia, delaying diagnosis (Pereyra *et al*., 2024). Symptoms—fatigue, nausea, constipation—can mimic normal pregnancy discomforts. When hypercalcemia is severe, risks include arrhythmias, dehydration, nephrolithiasis, acute kidney injury, and pancreatitis (Walker & Bilezikian, 2000). In this case, pancreatitis was a key diagnostic clue, known to occur due to calcium-mediated enzyme activation within the pancreas. Without prompt management, PHPT during pregnancy has been associated with increased maternal morbidity and, in historical cohorts, even mortality (Gurrado *et al*., 2012).

Fetal and Neonatal Considerations

Fetal calcium homeostasis depends on maternal calcium levels. Maternal hypercalcemia suppresses fetal parathyroid activity, increasing the risk of intrauterine growth restriction, preterm birth, and neonatal hypocalcemia (J. S. Gonçalves *et al*., 2022). In our patient, uterine contractions and abnormal fetal monitoring led to preterm cesarean delivery. The neonate, though premature, stabilized within 48 hours. Transient neonatal hypocalcemia is well documented in PHPT cases and underscores the importance of neonatal calcium monitoring postpartum (Walker & Bilezikian, 2000).

Management of Hypercalcemia in Pregnancy

There are no randomized trials or formal obstetric guidelines for PHPT in pregnancy. However, most expert reviews recommend parathyroidectomy in symptomatic patients or when serum calcium exceeds ~11.5 mg/dL (McCarthy *et al*., 2019). Surgery is safest in the second trimester. In late pregnancy, especially in critically ill patients, timing of intervention must be individualized. For this patient, medical stabilization—including aggressive IV hydration, furosemide, electrolyte correction, and hemodialysis—preceded curative surgery.

Hemodialysis, though rarely needed for hypercalcemia, can be lifesaving when calcium levels are refractory or complicated by renal dysfunction (Gurrado *et al*., 2012). Calcitonin, considered safe in pregnancy, can provide temporary calcium reduction (Ali *et al*., 2021). Bisphosphonates like zoledronic acid were administered after delivery due to their potential fetal skeletal effects. Cinacalcet, a calcimimetic, has been used off-label in pregnant PHPT cases to control calcium when surgery must be delayed, though its safety data remains limited (Foster & Maalouf, 2024).

Multidisciplinary Decision-Making in ICU

Management of PHPT during pregnancy, particularly with complications like pancreatitis or encephalopathy, requires coordinated multidisciplinary care. In this case, intensive care physicians led fluid and metabolic stabilization; endocrinologists interpreted hormonal and biochemical abnormalities; nephrologists managed dialysis; obstetricians timed delivery; and neonatologists ensured optimal postnatal care. Such collaboration is essential in PHPT cases with severe metabolic or obstetric complications (Pereyra *et al*., 2024).

This case underscores the complexity of managing a critically ill pregnant patient. A collaborative,

Delivery Planning and Postpartum Management

Delivery timing in PHPT is influenced by maternal condition and fetal maturity. If diagnosed earlier in pregnancy, definitive parathyroid surgery during the second trimester may prevent complications (McCarthy *et al*., 2019). In this case, emergency cesarean delivery allowed safe neonatal extraction and freed the mother for more intensive therapies. Postpartum, the focus shifted to definitive treatment and endocrine follow-up. After stabilization, imaging and further hormonal testing were initiated to rule out multiple endocrine neoplasia (MEN) and prepare for parathyroid surgery.

Comparison with Reported Cases

Most PHPT cases in pregnancy are diagnosed earlier, often during evaluation for nephrolithiasis or persistent nausea, and are managed successfully with second-trimester surgery (McCarthy *et al*., 2019). Severe presentations with hypercalcemic crisis, neurological symptoms, or pancreatitis are uncommon (Gurrado *et al*., 2012). The combination of acute pancreatitis and extensive bone lesions, as seen in our patient, is particularly rare. Few third-trimester cases with similar complications and urgent delivery have been reported (Augustin *et al*., 2024).

CONCLUSION

Severe primary hyperparathyroidism in pregnancy is an uncommon but perilous condition that demands early recognition and coordinated management. This case of a third-trimester pregnant patient with hypercalcemic crisis, pancreatitis, and skeletal lesions illustrates a severe case of PHPT and highlights the importance of a multidisciplinary team in guiding care. Key takeaways include maintaining suspicion for hypercalcemia in pregnant patients with neuropsychiatric or gastrointestinal symptoms, the need for prompt intervention (definitive surgery whenever feasible, with interim medical therapy as needed), and careful planning for delivery and neonatal care. Maternal and fetal outcomes can be significantly improved by timely treatment of PHPT. Ultimately, this case underscores that even rare metabolic emergencies in pregnancy can be successfully managed with intensive monitoring, collaborative decision-making, and adherence to principles derived from the limited but valuable literature on the topic.

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Conflict of Interest: The authors declare that they have no conflict of interest.

Ethics, Informed Consent, and Data Confidentiality Statement:

We confirm that oral and written informed consent was obtained from the patient and her relatives for the publication of this clinical case. All clinical data were handled in compliance with confidentiality standards, ensuring that the patient's privacy and personal information remain protected.

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