

Acute Pancreatitis in an Atypical Parathyroid Adenoma: A Rare Case of Hyperparathyroidism

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Abstract Primary hyperparathyroidism is a common manifestation of parathyroid disease. Atypical parathyroid adenoma and parathyroid carcinoma are rare causes of primary hyperparathyroidism and pathologic differentiation is challenging. A 44-year-old Caucasian female presented with abdominal pain, nausea, and vomiting. Her serum calcium, intact PTH, and lipase levels were elevated at presentation. Radiological assessment revealed a parathyroid mass. After parathyroidectomy, pathology demonstrated an atypical parathyroid adenoma. We present a case of primary hyperparathyroidism due to an atypical parathyroid adenoma associated with acute pancreatitis. Concurrence of severe hypercalcemia in the setting of atypical parathyroid adenoma and acute pancreatitis is very uncommon, with a small number of reported cases.

Keywords: *primary hyperparathyroidism, atypical parathyroid adenoma, acute pancreatitis*

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1. Introduction

Primary hyperparathyroidism (PHPT) is a medical condition that alters calcium metabolism. The most common presentation of PHPT is an asymptomatic patient with elevated serum calcium and elevated parathyroid hormone (PTH), or inappropriately normal PTH for elevated calcium levels. A minority of patients can present with or be complicated by acute pancreatitis in PHPT with a prevalence of 1.5 to 13 % [1]. Parathyroid carcinoma (PC) and atypical parathyroid adenoma (APA) are less frequent causes of PHPT accounting for $\leq 1\%$ and 1.2-1.3% of PHPT cases respectively [2]. Here, we present an uncommon case of acute pancreatitis with an atypical parathyroid adenoma.

2. Case Presentation

A 44-year-old Caucasian female presented with a one-week history of abdominal pain, nausea, and vomiting. Her past medical history was significant for depression and post-traumatic stress disorder. Four months prior to this admission, she was evaluated for hypercalcemia (total calcium 10.8 mg/dL [8.6-10.3 mg/dL]) and elevated PTH levels (136 pg/mL [12-88 pg/mL]) with an abnormal sestamibi parathyroid scan suggesting a right parathyroid

mass. Dual-energy X-ray absorptiometry scan showed left hip osteopenia. She reported unintentional weight loss in the past month. Physical examination did not reveal any palpable neck mass, but her abdomen showed moderate epigastric tenderness with deep palpation. Initial laboratory data showed calcium (Ca) 16.9 mg/dL, intact PTH 1,126 pg/mL, and lipase 389 U/L (11-82 U/L). Thyroid ultrasound (US) revealed a 3.1 cm right interlobar mixed cystic nodule, highly suggestive of a parathyroid mass. A sestamibi parathyroid scan demonstrated the same findings from four months prior (Figure 1). Abdominal US showed cholelithiasis without evidence of ductal dilation. CT scan of the upper abdomen with IV contrast revealed peripancreatic fat stranding (Figure 2). MRCP showed no evidence of ductal dilation or filling defect and a normal pancreatic duct. The patient was treated with aggressive fluid replacement, Pamidronate, Cinacalcet, and Calcitonin. She initially refused parathyroidectomy and was discharged on Cinacalcet. One month later, she presented with nausea, decreased appetite, constipation, and depression. Calcium was 14.3 mg/dL and PTH 299 pg/mL. Patient subsequently underwent right thyroidectomy and left inferior parathyroidectomy. Post-operatively her serum Ca and PTH normalized, and she was discharged on calcium and vitamin D supplementation. Pathology revealed benign hypercellular parathyroid tissue from the left inferior parathyroid and atypical parathyroid adenoma versus early low-grade parathyroid carcinoma from the right superior parathyroid (Figure 3 - Figure 4).

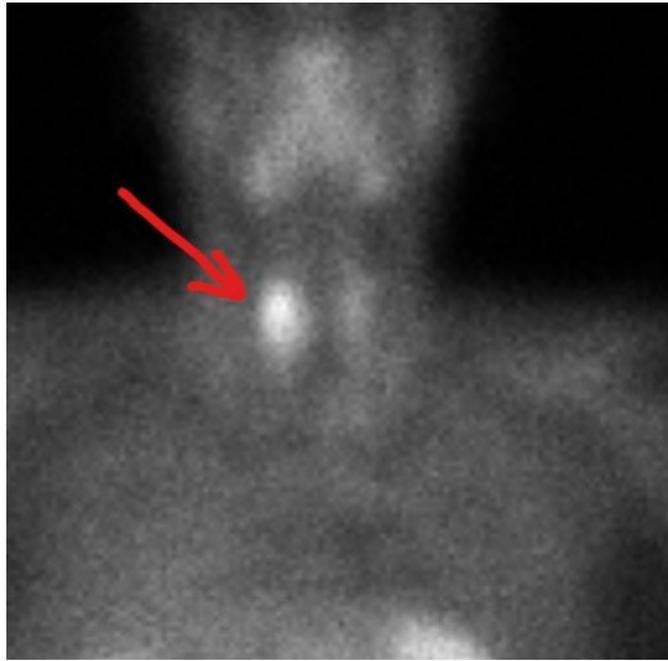


Figure 1. Sestamibi parathyroid scan with focal increased radiotracer activity

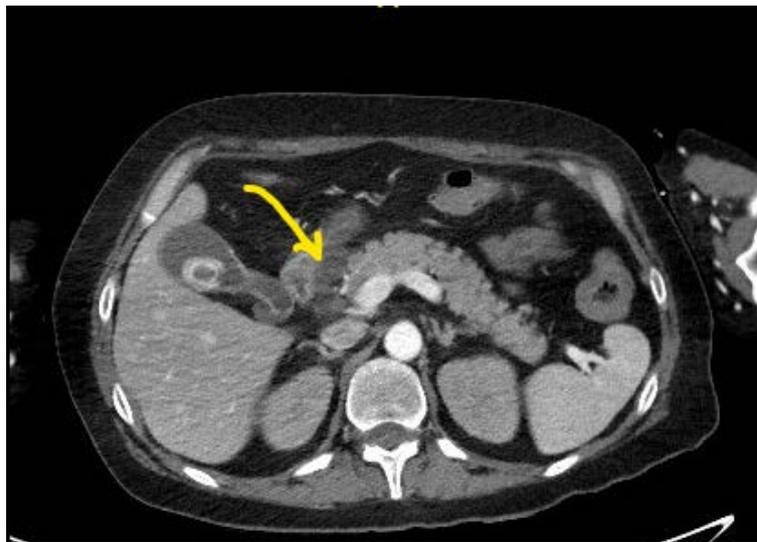


Figure 2. Fat stranding surrounding the pancreas head

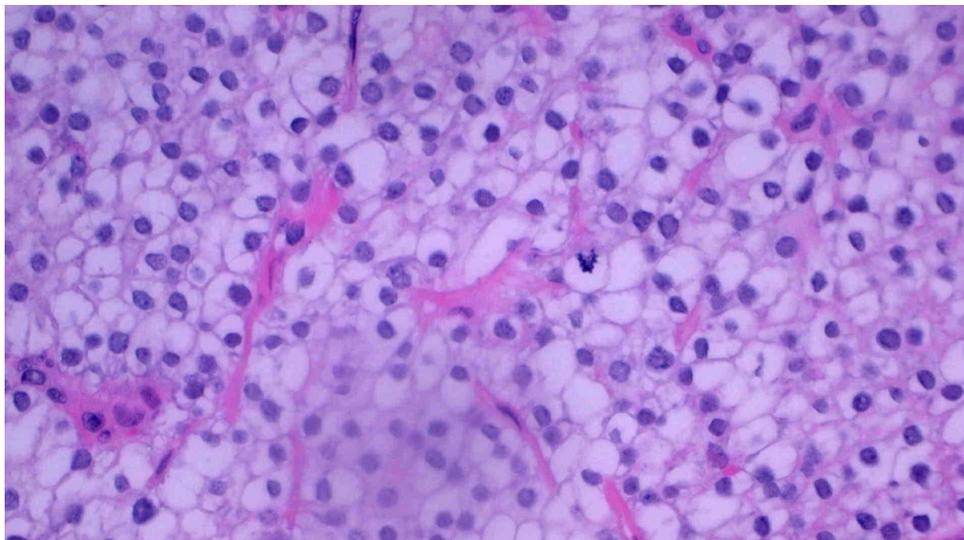


Figure 3. Right superior parathyroid H & E 400x; clear cells with mitotic figure

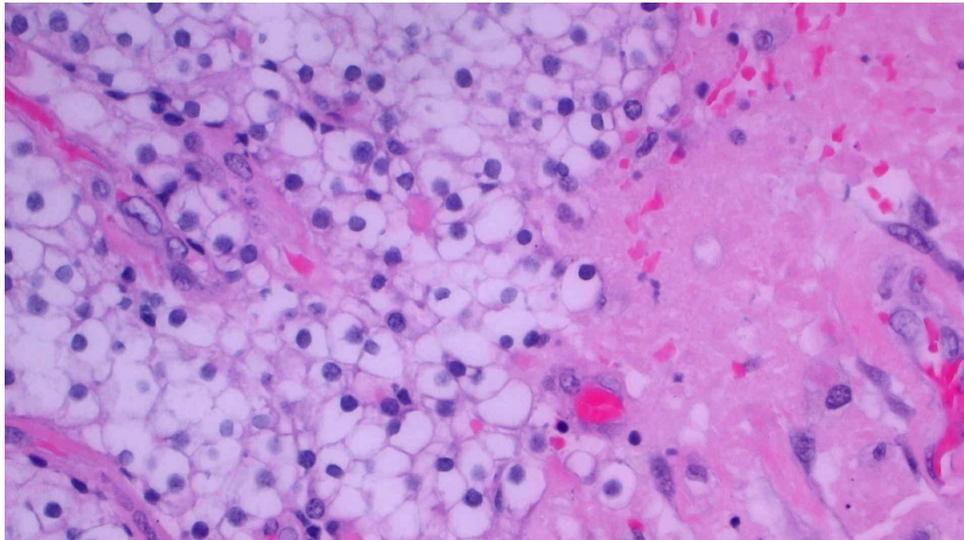


Figure 4. Right superior parathyroid H&E 400x; clear cells & necrosis

3. Discussion

Parathyroid carcinoma (PC) and atypical parathyroid adenoma (APA) are less frequent causes of PHPT accounting for $\leq 1\%$ and 1.2-1.3% of PHPT cases respectively [2]. As in our case, patients with PHPT who present with parathyroid crisis (a life-threatening condition due to multiorgan dysfunction in the setting of severe hypercalcemia) should raise a suspicion of parathyroid carcinoma. Among atypical parathyroid adenoma and parathyroid carcinoma, pathologic differentiation is challenging due to the similarity of their microscopic appearance [3]. The presence of atypical cells, areas of increased mitotic activity, necrosis, and fibrosis are common pathological findings in both [4]. Atypical parathyroid adenomas lack definitive invasive features [5,6]. Parafibromin and Ki-67 are immunohistochemical markers common to both and are used in combination with histopathological findings for diagnosis [7]. Both atypical parathyroid adenoma and parathyroid carcinoma have a higher incidence of symptomatic hypercalcemia when compared with typical adenoma [2]. The intraoperative findings play a key role in differentiating malignant and benign lesions, but its usefulness is limited in differentiating APA from PC due to their histological superimposition [8,9]. APA has been shown to have a good surgical response and low recurrence [4]. Even though, some experts, based on their own experience, recommend a close follow-up [10].

PHPT was first reported to have an association with pancreatitis in 1903 by Erdheim after a case of pancreatitis in a patient with parathyroid adenoma [11]. Subsequently, multiple case reports have emerged suggesting a causal relationship. Acute pancreatitis in the setting of hypercalcemia resulting from PHPT has a low prevalence, 1.5-7% [12]. The general proposed mechanism of pancreatitis related to hypercalcemia is due to deposition of calcium in the pancreatic duct, and calcium activation of trypsinogen to trypsin within the pancreatic parenchyma and subsequent autodigestion [13]. The likelihood of pancreatitis may be related to the acuity of calcium elevation and possible additional factors as people with chronic hypercalcemia tend to have low prevalence

of pancreatitis in comparison with people with acute hypercalcemia [1,13]. PC usually shows more severe hypercalcemia and more complications, but some fatal cases of acute pancreatitis have been reported in the setting of APA [14,15].

4. Conclusion

The objective of this case is to highlight an uncommon presentation of a rare disease (APA). Physicians should suspect atypical parathyroid adenoma or primary carcinoma in symptomatic patients with concurrent marked elevation in Ca and PTH levels. Also, to consider PHPT as the cause of acute pancreatitis when a patient has hypercalcemia and negative workup for the most common causes (gallstone, alcohol, post-ERCP and hypertriglyceridemia).

References

- [1] Khoo, T. K., Vege, S. S., Abu-Lebdeh, H. S., Ryu, E., Nadeem, S., & Wermers, R. A. (2009). Acute pancreatitis in primary hyperparathyroidism: a population-based study. *The Journal of Clinical Endocrinology & Metabolism*, 94(6), 2115-2118.
- [2] Galani, A., Morandi, R., Dimko, M. et al. Atypical parathyroid adenoma: clinical and anatomical pathologic features. *World J Surg Onc* 19, 19 (2021).
- [3] SCULLY, R et al Case 32-1996. A 44-Year-Old Woman with a Long History of Intermittent Hypercalcemia, a New Neck Mass, and Hypercalcemic Crisis, *N Engl J Med* 1996; 335:1213-1220.
- [4] Pearlstein, S. S., Eric, K., Kate, C. H., Khanafshar, E., & Duh, Q. Y. (2021). Clinical Behaviors of Atypical Parathyroid Adenomas. *Journal of the Endocrine Society*, 5(Suppl 1), A258-A259.
- [5] Carlson D. Parathyroid pathology: Hyperparathyroidism and parathyroid tumors. *Arch Pathol Lab Med* 2010; 134: 1639-44.
- [6] Thompson LD. Benign and malignant neoplasms of the parathyroid glands. In: Goldblum JR, editor. *Endocrine Pathology*. 2nd ed. London: Churchill Livingstone; 2006. p. 157-81.
- [7] Fernandez-Ranvier, G.G., Khanafshar, E., Jensen, K., Zarnegar, R., Lee, J., Kebebew, E., Duh, Q.-Y. and Clark, O.H. (2007). Parathyroid carcinoma, atypical parathyroid adenoma, or parathyromatosis?. *Cancer*, 110: 255-264.
- [8] SCULLY, R et al Case 32-1996 — A 44-Year-Old Woman with a Long History of Intermittent Hypercalcemia, a New Neck Mass, and Hypercalcemic Crisis, *N Engl J Med* 1996; 335: 1213-1220.
- [9] G Ippolito, F F Palazzo, F Sebag, C De Micco, J F Henry, Intraoperative diagnosis and treatment of parathyroid cancer and

- atypical parathyroid adenoma, *British Journal of Surgery*, Volume 94, Issue 5, May 2007, Pages 566-570.
- [10] Cetani, F., Marcocci, C., Torregrossa, L., & Pardi, E. (2019). Atypical parathyroid adenomas: challenging lesions in the differential diagnosis of endocrine tumors, *Endocrine-Related Cancer*, 26(7), R441-R464. Retrieved Feb 9, 2022, from <https://erc.bioscientifica.com/view/journals/erc/26/7/ERC-19-0135.xml>.
- [11] Erdheim J (1903) Zur Normalen und Pathologischen Histologie der Glandule Thyroidea, Parathyroidea und Hypophysis. *Beitrage zur pathologischen Anatomie und zur allgemeinen. Pathologie* 33: 158.
- [12] Egea Valenzuela J, Belchi Segura E, Sanchez Torres A, et al.: Acute pancreatitis associated with hypercalcemia. a report of two cases. *Rev Esp Enferm Dig.* 2009, 101:65-9.
- [13] Bess MA, Edis AJ, van Heerden JA. Hyperparathyroidism and pancreatitis. Chance or a causal association? *JAMA.* 1980 Jan 18; 243(3): 246-7. PMID: 7350371.
- [14] Sherin Hashem, MD PhD, Grace Lin, MD PhD, Vera Vavinskaya, MD, Oluwole Fadare, MD, SAT-352 Severe Primary Hyperparathyroidism, Hypercalcemic Crisis, Acute Pancreatitis and Fatality: Complications of Atypical Parathyroid Adenoma, a Case Report, *Journal of the Endocrine Society*, Volume 4, Issue Supplement_1, April-May 2020, SAT-352.
- [15] Lee, J., Lin, E., Hashem, S., Fadare, O., & Sell, R. E. (2020). Acute Pancreatitis as a Manifestation of Primary Hyperparathyroidism. In C43. CRITICAL CARE CASE REPORTS: THE GASTROINTESTINAL TRACT, LIVER, AND PANCREAS (pp. A5145-A5145). American Thoracic Society.



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