Gastroenterology Report, 6(3), 2018, 231–233

doi: 10.1093/gastro/gow029
Advance Access Publication Date: 10 September 2016
Case report

CASE REPORT

A life-threatening duodenal ulcer hemorrhage due to previously unknown primary hyperparathyroidism

Dan Xie[1,†], Kunpeng Hu[2,†], Ying Xian[1], Ying Wang[1], Xiaofeng Yuan[1], Mingliang Li[1], Xiaogang Bi[1], Kouxing Zhang[1,*]

[1]Department of General Intensive Care Unit of Lingnan Hospital, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, Guangdong, China and [2]Department of General Surgery of Lingnan Hospital, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, Guangdong, China

*Corresponding author. Department of General Intensive Care Unit of Lingnan Hospital, the Third Affiliated Hospital of Sun Yat-sen University, 2693 Kaichuang Dadao, Guangzhou, Guangdong 510000, China. Email: kxz6210@126.com

†Contributed equally

Abstract

Peptic ulcer bleeding due to primary hyperparathyroidism is extremely rare. We report a case of a 42-year-old male with life-threatening acute upper gastrointestinal bleeding secondary to a duodenal ulcer and a history of kidney stones. Gastroscopic therapy, Billroth II gastrointestinal anastomosis and angiographic embolization were sequentially conducted to arrest the hemorrhage. A complete investigative work-up revealed that the duodenal ulcer bleeding was due to primary hyperparathyroidism coexisting with a parathyroid adenoma. Following this event, the patient developed a severe abdominal cavity infection and sepsis. An elective parathyroidectomy was performed, and the histology was confirmed to be a typical parathyroid adenoma. Postoperatively, the patient's calcium and parathyroid levels were normalized. Attention should be paid to patients with an upper gastrointestinal ulcer, especially when it is accompanied by kidney stones.

Key words: primary hyperparathyroidism; peptic ulcer hemorrhage; hypercalcemia

Introduction

Upper gastrointestinal (UGI) bleeding is the most common complication of peptic ulcer disease. *Helicobacter pylori* infection and nonsteroidal anti-inflammatory drug administration are two independent risk factors for peptic ulcerbleeding. However, there are still some less common causes for UGI bleeding such as primary hyperparathyroidism (PHPT). Peptic ulcer disease is usually a manifestation of primary hyperparathyroidism [1–5], although the complete pathophysiological mechanism has not yet been established [6–14]. However, only a few cases of peptic ulcer bleeding, due to primary hyperparathyroidism have been reported [14–17]. In this article, we report the case of a life-threatening duodenal ulcer hemorrhage due to primary hyperparathyroidism coexisting with a parathyroid adenoma.

Case Report

A 42-year-old male presented to the emergency department complaining of an upper abdomen paroxysmal cramp for one week. He had a five-year history of multiple kidney stones and had been consistently treated for these without any further work-up. The patient was admitted to the Department of Urology Surgery with the suspicion of renal colic. On day two, he excreted a large amount of tarry stool accompanied by

Submitted: 16 June 2016; **Revised:** 24 July 2016; **Accepted:** 1 August 2016

coffee-ground emesis. The patient's blood pressure dropped, and he received a blood transfusion and rehydration. The patient was then transferred to the Intensive Care Unit for further treatment. A bedside upper gastrointestinal endoscopy was performed, revealing a duodenal ulcer with an adherent clot that was freely oozing (Forrest-Ib, Figure 1). An intragastric local instillation of norepinephrine and epinephrine was administered to stop the bleeding. However, eight hours later, the patient again excreted a large amount of tarry stools and vomited a copious amount of coffee-ground material. An emergent subtotal gastrectomy and Billroth II gastrointestinal anastomosis were performed to arrest the bleeding. On day four, his heart rate became rapid (132–144 beats per minute), his central venous pressure dropped, his blood hemoglobin decreased, and his abdominal circumference increased. An ultrasound examination detected a hematocele in the left upper quadrant. There was still active bleeding. Finally, gastroduodenal artery embolization was carried out to stop the hemorrhage.

During the process, we noted that the patient's serum calcium level was elevated (2.98 mmol/L, normal range 2.03–2.65 mmol/L) and that he had a low serum phosphorus level (0.5 mmol/L, normal range 0.74–1.52 mmol/L), which is uncommon in a patient with renal dysfunction (serum creatinine level was 286 μmol/L, normal range 31.8–116 μmol/L). His plasma parathyroid hormone (PTH) level was found to be elevated in a subsequent test (468.67 pg/ml, normal range 12–65 pg/ml). A neck computed tomography (CT) scan with contrast showed two enhancing masses (larger mass size 10 × 9 mm) in the rear of the right lobe of his thyroid gland (Figure 2). To exclude multiple endocrine neoplasia I (MEN I) and Zollinger-Ellison syndrome, CT imaging studies of the head and abdomen were performed and did not indicate any abnormalities. All of these findings suggested a diagnosis of primary hyperparathyroidism.

Unfortunately, in the next period, the patient developed severe abdominal pain, tenderness, guarding and rebound pain upon abdominal palpation. Heart rate was rapid (150–160 beats per minute), and his leucocyte count in blood was high (18.57×10^9/L). White blood cell count of the peritoneal drainage fluid was 111005 × 106. These signs indicated a severe abdominal cavity infection, peritonitis and sepsis. Intravenous antibiotics (imipenem 1 g every 8 hours; tigecycline 50 mg every 12 hours) were used to control infection. Additionally, the patient's creatinine level increased to 560 μmol/L. Continuous renal replacement therapy (CRRT) was used to treat the hypercalcemia and remove the inflammatory mediators and metabolic toxin products. On day 19, the patient underwent elective surgical exploration with excision of the parathyroid adenoma. Histology of the two parathyroid glands revealed a typical parathyroid adenoma (Figure 3).

After surgery, the patient's PTH level was normalized (6.29 pg/ml), and his calcium level decreased rapidly (2.24 mmol/l). On day 22, he was transferred to the general ward. Three months after parathyroidectomy, the patient's PTH and calcium levels were 74.97 pg/ml and 2.05 mmol/l, respectively. The serum creatinine level also decreased to 175 μmol/L. At 8 months follow-up, the patient's PTH and calcium levels were 101.84 pg/ml and 2.17 mmol/l, respectively. The patient denied any digestive tract symptoms such as abdominal pain and diarrhea.

Discussion

Primary hyperparathyroidismis a disorder in which the parathyroid gland inappropriately secretes high PTH levels, which leads to hypercalcinemia,, and kidney stone is a classical clinical symptom of primary hyperparathyroidism. Solitary parathyroid adenomas are responsible for primary hyperparathyroidism in 80–85% of such cases. Definitive treatment is achieved by surgical resection. However, the disease has no specific symptoms. The diagnosis of PTPH is usually made incidentally with an initial finding of hypercalcemia on routine laboratory studies, which leads to further investigation.

In this report, the patient was initially managed for an upper gastrointestinal hemorrhage. A high index of suspicion for hyperparathyroidism developed when we noted an elevated serum calcium level and a low serum phosphorus level, which are abnormal in a renal failure patient. Upon further testing, the patient's plasma parathyroid hormone level was found to be elevated. A neck CT scan with contrast showed two solitary parathyroid adenomas, which were subsequently managed surgically and confirmed histologically. In some cases, primary hyperparathyroidism is a manifestation of multiple endocrine neoplasia I and usually occurs in combination with Zollinger-Ellison syndrome. Gastrointestinal bleeding is the initial presentation in a quarter of patients with Zollinger-Ellison syndrome [18]. In this case, CT imaging studies of the head and abdomen did not exhibit any abnormalities of the pituitary gland or pancreas. After excision of the parathyroid adenomas, the patient's

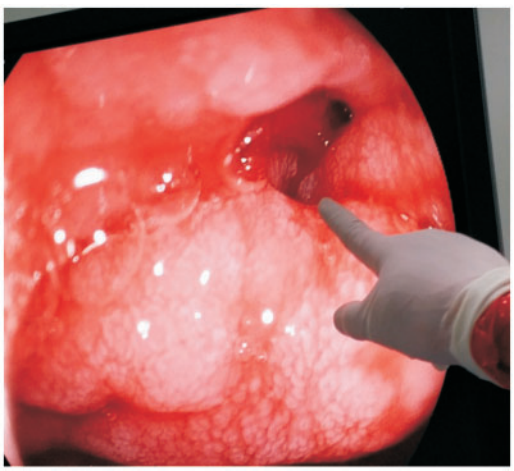

Figure 1. Endoscopy demonstrated a duodenal ulcer bleeding.

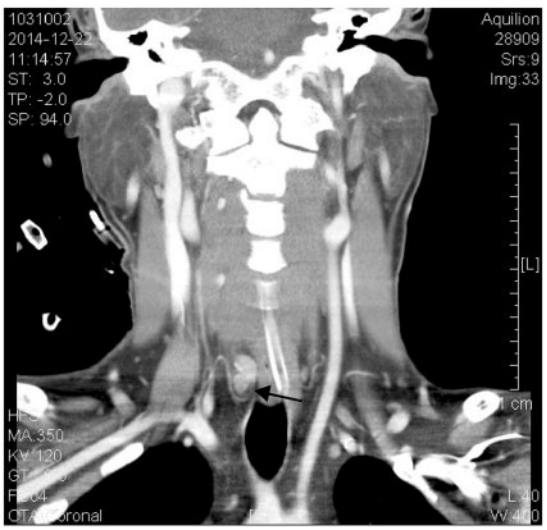

Figure 2. Two enhanced masses in the rear of the right lobe of thyroid gland.

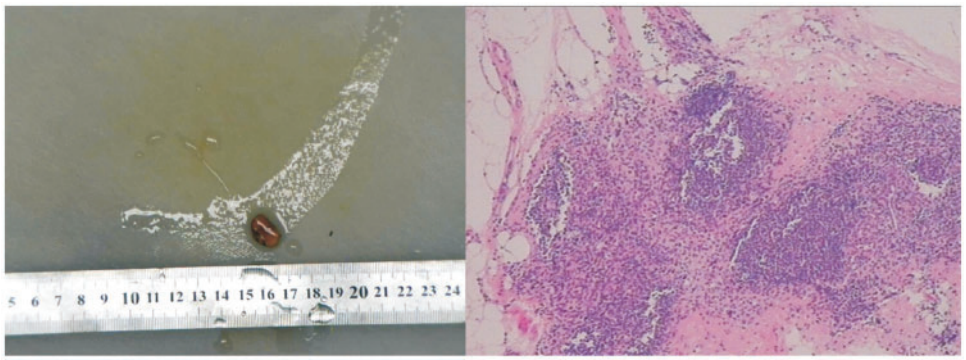

Figure 3. Histology of parathyroid gland.

PTH and calcium levels normalized. No pancreatic tumor-like symptoms such as diarrhea or hypokalemia were observed. Additionally, no regular upper abdominal pain was observed. These results support the diagnosis of primary hyperparathyroidism caused by a parathyroid adenoma.

Due to severe sepsis and renal dysfunction, CRRT was used to remove inflammatory mediators and metabolic toxin products with the advantage of potentially avoiding the development of hypotension in a hemodynamically unstable and critically ill patient. It also decreased the serum calcium level to prevent a calcium crisis. There are few case reports in the current literature documenting effective treatment of hypercalcemia with CRRT [20–22]. We considered CRRT to be a good therapeutic choice for preventing a calcium crisis in this patient.

In conclusion, peptic ulcer bleeding due to primary hyperparathyroidism is extremely rare. The serum calcium level and PTH level must be considered routine tests in patients with a peptic ulcer, especially when it is accompanied by a history of kidney stones with hypercalcemia. Parathyroidectomy is recommended in patients with primary hyperparathyroidism that are clinically symptomatic. The CRRT could be considered a good therapy choice for preventing a calcium crisis in septic patients with renal dysfunction.

Funding

Supported by Science and Technology Planning Project of Guangdong Province, China (2014A020212715)

Conflicts of interest statement: none declared.

References

1. Gasparoni P, Caroli A, Sardeo G, *et al*. Primary hyperparathyroidism and peptic ulcer. *Minerva Med* 1989;**80**:1327–30.
2. Clark CG, Chowcat NL, Lewin MR, *et al*. Surgery for peptic ulceration associated with hypergastrinaemia. *Br J Surg* 1986;**73**:248–52.
3. Corlew DS, Bryda SL,2Bradley EL 3rd, *et al*et al. Observations on the course of untreated primary hyperparathyroidism. *Surgery* 1985;**98**:1064–71.
4. Mowat E, Gunn A, Paterson CR. Hyperparathyroidism in peptic ulcer patients. *Br J Surg* 1981;**68**:455–8.
5. Gardner EC Jr and Hersh T. Primary hyperparathyroidism and the gastrointestinal tract. *South Med J* 1981;**74**:197–9.
6. Reeder DD, Jackson BM, Ban J, *et al*. Influence of hypercalcemia on gastric secretion and serum gastrin concentrations in man. *Ann Surg* 1970;**172**:540–6.
7. Barreras RF. Calcium and gastric secretion. *Gastroenterology* 1973;**64**:1168–84.
8. Stremple JF and Watson CG. Serum calcium, serum gastrin, and gastric acid secretion before and after parathyroidectomy for hyperparathyroidism. *Surgery* 1974;**75**:841–52.
9. Patterson M, Wolma F, Drake A, *et al*. Gastric secretion and chronic hyperparathyroidism. *Arch Surg* 1969;**99**:9–14.
10. Wise SR, Quigley M, Saxe AW, *et al*. Hyperparathyroidism and cellular mechanisms of gastric acid secretion. *Surgery* 1990;**108**:1058–63.
11. Geibel JP, Wagner CA, Caroppo R, *et al*. The stomach divalent ion-sensing receptor scar is a modulator of gastric acid secretion. *J Biol Chem* 2001;**276**:39549–52.
12. Corleto VD, Minisola S, Moretti A, *et al*. Prevalence and causes of hypergastrinemia in primary hyperparathyroidism: a prospective study. *J Clin Endocrinol Metab* 1999;**84**:4554–8.
13. Dökmetaş HS, Türkay C, Aydin C, *et al*et al. Prevalence of Helicobacter pylori in patients with primary hyperparathyroidism. *J Bone Miner Metab* 2001;**19**:373–7.
14. Sato H, Abe K, Oshima N, *et al*. Primary hyperparathyroidism with duodenal ulcer and H. pylori infection. *Intern Med* 2002;**41**:377–80.
15. Goretzki PE, Becker H, Dotzenrath C, *et al*. Acute abdomen in unrecognized hyperparathyroidism. *Wien Klin Wochenschr* 1988;**100**:373–5
16. Sarter S and Pier A. Forrest 1b duodenal hemorrhage in previously undiagnosed primary hyperparathyroidism. *Zentralbl Chir* 1996;**121**:869–71
17. Sawa TE and Safar SB. Pathological fracture: a common presentation of primary hyperparathyroidism in Iraq. *Eur J Surg* 1996:**162**:777–81.
18. Roy PK, Venzon DJ, Shojamanesh H, *et al*. Zollinger-Ellison syndrome. Clinical presentation in 261 patients. *Medicine (Baltimore)* 2000;**79**:379–411.
19. Silverberg SJ, Shane E, Jacobs TP, *et al*. A 10-year prospective study of primary hyperparathyroidism with or without parathyroid surgery. *N Engl J Med* 1999;**341**:1249–55.
20. Srámek V, Novák I, Matějovic M, *et al*. Continuous venovenous hemodiafiltration (CVVHDF) with citrate anticoagulation in the treatment of a patient with acute renal failure, hypercalcemia, and thrombocytopenia. *Intensive Care Med* 1998;**24**:262–4.
21. Kindgen-Milles D, Kram R, Kleinekofort W, *et al*. Treatment of severe hypercalcemia using continuous renal replacement therapy with regional citrate anticoagulation. *ASAIO J* 2008;**54**:442–4.
22. Au S, Dunham M, Godinez T. Treatment of medically refractory hypercalcemic crisis. *Int J Artif Organs* 2012;**35**:538–41.