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Case Report

Hyperparathyroidism with acute pancreatitis in elderly patient treated by radiofrequency ablation: A case report [☆]

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ABSTRACT

Acute pancreatitis as an initial manifestation of primary hyperparathyroidism (PHPT) has been rarely reported. We report a case of acute pancreatitis from a hyperfunctioning parathyroid tumor in an 87-year-old woman with drowsy state. Laboratory tests showed high lipase, calcium, and intact parathyroid hormone level, and abdominal computed tomography scan revealed acute pancreatitis. Neck ultrasound and scintigraphy gave rise to the diagnosis of primary hyperparathyroidism due to a left parathyroid tumor. The patient underwent radiofrequency ablation of the parathyroid tumor. After the procedure, symptoms subsided and patient was discharged from the hospital 2 weeks later. Six months of treatment, the PTH and calcium serum significantly reduced, her clinical presentation was stable, and there were no signs or symptoms of recurrence pancreatitis.

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Introduction

Primary hyperparathyroidism is an endocrine disease, characterized by increasing in parathyroid hormone (PTH) secretion. PTH affects calcium reabsorption in the kidneys and intestines and stimulates bone resorption to increase calcium concentration level. The onset of the disease is very diverse, ranging from nonspecific symptoms such as fatigue, anorexia, constipation, thirst, weight loss, bone pain to specific mani-

festations such as recurrent kidney stones, kidney calcification, osteoporosis, fractures bone, in which acute pancreatitis is the first manifestation of primary hyperparathyroidism is a rare situation [1]. The relationship between the 2 diseases is still controversial. Regarding the treatment of primary hyperparathyroidism, surgery is the basic method for those with indications and combined with internal medicine to reduce calcium concentration. However, in the case of elderly patients, complex underlying diseases, and high surgical risk, minimally invasive intervention has also been proposed in a

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Fig. 1 – Abdominal CT image with contrast showed enlarged pancreatic, loss of enhancement at the pancreatic body and tail were seen in the post-contrast images (arrow) and peripancreatic fat stranding.

few studies and has been proven to be safe and effective [2]. We report a case of acute pancreatitis due to primary hyperparathyroidism causing hypercalcemia that was successfully treated by a combination of medical treatment and minimally invasive intervention.

Case report

An 87-year-old female was admitted to hospital in a state of drowsiness. History of hypertension for many years, she had been treated with 40/12.5 mg telmisartan/hydrochlorothiazide (Micardis plus, Boehringer Ingelheim, Germany) per day.

In local hospital, she had check-up normal head computed tomography (CT) scan, normal glucose concentration but very high calcium level. After that, she was transferred to second hospital. Clinical examination at admission: The patient was drowsy, had a Glasgow score of 8, and had been intubated. Vital signs were within normal limits and the skin was dry. There were no focal neurological signs. There were no clinical signs of infection. Abdominal CT scan showed severe acute necrotizing pancreatitis, fluid infusion. She had endotracheal tube placement.

Laboratory tests when admission: Acute kidney failure with glomerular filtration rate (GRF) 33 mL/min, elevated lipase 3898 U/L, normal triglycerides, Hb 118 g/L, Hct 0.37%, elevated total calcium 4.46 mmol/L, high calcium ion 2.4 mmol/L.

Abdominal ultrasound: enlarged pancreas, surrounding fat infiltration, abdominal CT image of acute necrotizing pancreatitis- CTSI 6 points (Fig. 1), CT scan of the brain to rule out other causes of consciousness disorders had not detected any abnormalities.

Management: invasive ventilator, dialysis, Calcitonin (Miacalcic, Novartis Pharma, Sweden) 400 IU/day injection, isotonic fluid infusion, diuretics, after 9 days the acute pancreatitis was stable, calcium returned to normal range.

Looking for the cause of increased blood calcium, we did a PTH test: 1866 pg/mL (reference range 15-68 pg/mL), hy-

pophosphatemia 0.32 mmol/L (0.8-1.3), low vitamin D 23.16 ng/mL (30-100 ng/mL). The patient had a neck ultrasound and found a hypoechoic mass located on the lower pole of left thyroid lobe, measuring 16 × 10 × 5 mm, with increased peripheral vascularity (Fig. 2A). Parathyroid scintigraphy with Tc-99m showed increased radioactivity in the lower pole of the left lobe of the thyroid gland (Fig. 2B).

The patient was consulted with a multidisciplinary team. Because of her age, underlying disease, and high risk of surgery, the board decided to treat the parathyroidism with minimally invasive intervention. We performed radiofrequency ablation (RFA) the parathyroid tumor. We used lidocaine 2% injected around the parathyroid gland and the thyroid capsule in a transthyroidal approach. Hydrodissection technique was used by injecting 20 mL cold dextrose solution 5% (D5W) between the parathyroid gland and adjacent structures to prevent thermal injury to adjacent structures. Transthyroidal approach, an 18-gauge RFA probe with a 0.5-cm active tip was introduced into the tumor. Radiofrequency power was set within 15-20 W. The electrode tip was positioned in the deepest and distal portion of the tumor, and “moving shot” technique was used. When the transient hyperechoic zone formed at the electrode tip, the tip was moved proximally in a non-ablated part of the tumor (Fig. 3A). This step was repeated in a way as to cover the entire tumor (Fig. 3B). There were no complications related to the procedure. Following treatment, blood test PTH, total calcium, and ionized calcium responded were calculated (Table 1). Two weeks after RFA, the patient is stable and discharged from the hospital. After 6 months of treatment, although PTH was still higher than normal range, her clinical presentation was stable with no sign or symptoms of recurrence pancreatitis.

Discussion

The association of pancreatitis in patients with PHPT is reported to be 1.5%-15.3% [3]. There have been more than 10 retrospective studies on pancreatitis associated with PHPT, most of the studies showed that the rate of pancreatitis in patients with PHPT was higher than in patients without PHPT [1,3,4]. Both necrotizing and edematous pancreatitis are presented with hyperparathyroidism, 1,4 however, there has been no research of comparative assessment of which type is more common. The mechanism of pancreatitis during PHPT remains controversial but may be related to hypercalcemia. Increased level of calcium in pancreatic juice led to activation of pancreatic proteases, particularly trypsin; calcium precipitation and formation of protein plugs responsible for upstream pancreatitis [4]. Hypercalcemia can lead to the formation of pancreatic calculi, ductal causing acute, or chronic pancreatitis [1]. In addition, genetic factors have been found, PHPT patients with AP had a higher prevalence of mutation of SPINK1 gene (Serine Protease Inhibitor Kazal type I) and CFTR gene (Cystic Fibrosis Transmembrane Conductance Regulator) [5]. Therapeutically, management of acute pancreatitis and serum calcium is necessary, most reports cited that parathyroidectomy led to the resolution of pancreatitis and prevented recurrence of acute pancreatitis [3]. Most of the reports had short-time

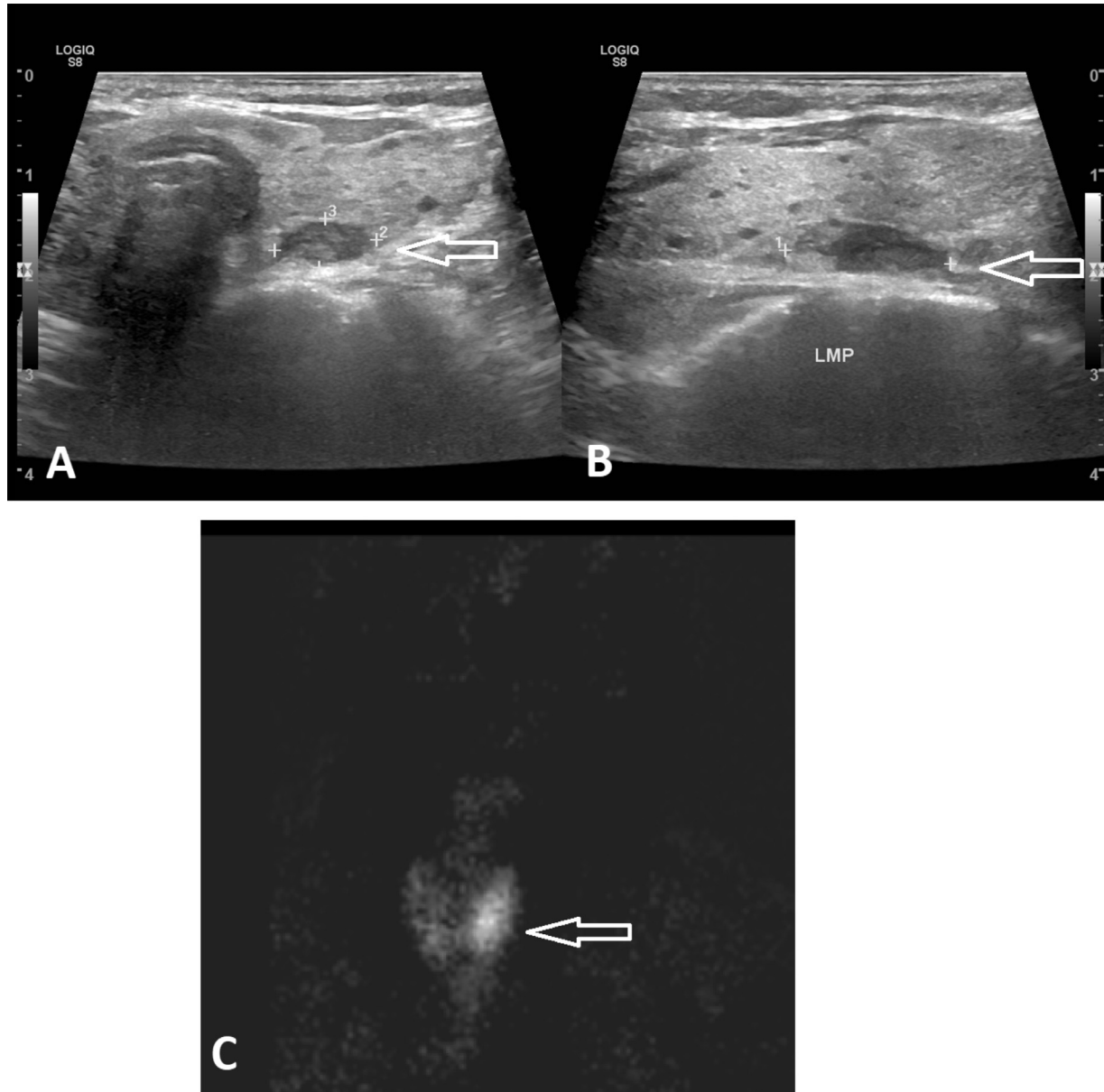


Fig. 2 - (A and B) A hypoechoic nodule on the lower pole of left thyroid lobe (arrows), (C) A scintigram with Tc-99m increasing radioactivity in the corresponding position (arrow).

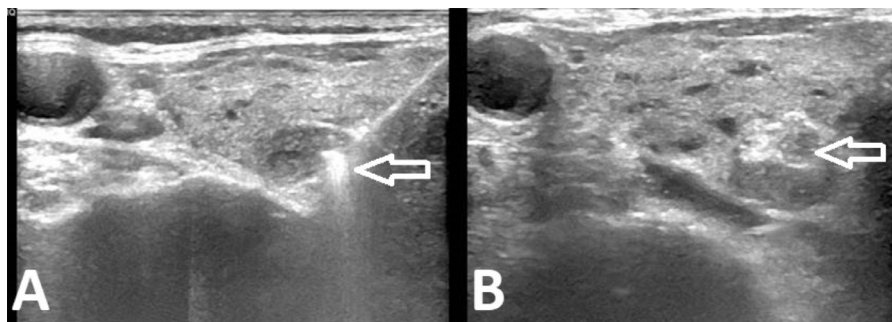


Fig. 3 - Ultrasound-guided RFA procedure. (A) The arrow indicates the hyperechoic zone formed at the electrode tip. (B) After procedure, the hyperechoic zone covered the entire tumor.

Table 1 – Blood test before and after RFA

	Before RFA	1 day after RFA	1 wk after RFA	6 mo after RFA
PTH (pg/mL)	1866	556.1	290	132
Total calcium (mmoL/L)	4.46	2.23	2.2	2.39
Ionized calcium (mmoL/L)	2.4	1.19	1.19	1.25

follow-ups. Among patients with PHPT and pancreatitis who underwent parathyroidectomy, there was a 42%–100% resolution in pancreatitis recurrence [3]. There have been no reports of using RFA to treat PHPT in patients associated with acute pancreatitis. It is recommended that parathyroidectomy in almost all patients with PHPT, who had no contraindications to surgery [3]. In patients who had contraindications to surgery or refused surgery, RFA is an alternative treatment.

Ultrasound-guided RFA was first used successfully in 2002 by Hänslér et al. as a treatment for single parathyroid adenoma [6]. RFA in patients with primary hyperparathyroidism has been used in some patients who cannot tolerate or refuse to undergo surgery. Some studies showed that ultrasound-guided RFA was effective and safe for PHPT patients and may be an alternative treatment tool for patients who cannot or refuse surgery [2,7]. Besides, RFA is also effective in patients suffering from secondary hyperparathyroidism [8]. Chai et al. [7] reported that 38 of the 39 nodules in the 39 enrolled participants had complete ablation after RFA, some complications of RFA include hoarseness, recurrent laryngeal nerve paralysis, hypocalcemia, pain, subcutaneous edema, and cough and recurrent laryngeal nerve paralysis occurred in 5.1% and spontaneously within 1–3 months. A study by Liu et al. [9] showed that RFA for PHPT is an effective and safe procedure in the treatment of PHPT with the cure rate was 80.49%. Besides, ultrasound-guided ethanol injection and ultrasound-guided microwave ablation in PHPT may be considered suitable alternative treatments in patients who are not candidates for surgery [9–12]. Liu et al [9] demonstrated that there was no difference in cure rate between the MWA group and the RFA group. A prospective self-controlled trial by Yazdani et al. [12] showed that 84.5% of the patients improved symptoms after 1 year of ethanol ablation therapy with no major complications.

The management of our patient was based on factors including old age, underlying disease as well and hospitalization for complications of acute pancreatitis due to hypercalcemia. Surgery has a high risk, so minimal invasive treatment is more appropriate. After RFA, there were no complications, the PTH serum decreased rapidly and calcium serum returned to normal.

Conclusion

Acute pancreatitis due to PHPT is rare. The presence of PHPT when higher calcemic during acute pancreatitis should always be attention. RFA of parathyroid tumor is effective and may be a viable alternative to parathyroidectomy in patients with a high risk of surgery.

Patient consent

We explained the use of the information for this case report to the patient and obtained their consent. Written informed consent was obtained from the patient for publication of this case report.

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