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Euglycemic Diabetic Ketoacidosis (DKA) – A Study of Two Cases

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INTRODUCTION
Euglycemic DKA is characterised by increased anion gap metabolic acidosis, ketonemia or ketonuria and normal blood glucose levels. Here we describe 2 different cases of euglycemic DKA.

CASE 1
A 40-year-old lady who was newly diagnosed with type 2 diabetes mellitus was started on Empaglifozin 12.5 mg OD by her general practitioner. Four days later, she presented with acute abdominal pain and gastrointestinal losses. Further history revealed total carbohydrate restriction one week prior to presentation in an effort to improve her glucose control. Upon admission there was severe metabolic acidosis (pH 7.035 and HCO3 6.3 mEq/L on arterial blood gas analysis), slightly elevated capillary blood glucose (CBG) (8.0 mmol/L), and high serum ketones (4.2 mEq/L). Fluid resuscitation with normal saline was initiated, and dextrose and insulin infusion were maintained. We withheld the sodium glucose cotransporter 2 inhibitor (SGLT2i) and she was discharged well with low dose basal bolus insulin.

CASE 2
A 44-year-old lady with background history of diabetes mellitus, hypertension, hyperlipidemia and morbid obesity, was electively admitted for laparoscopic Roux-en-Y gastric bypass surgery. She was prescribed with a very low-calorie diet as per protocol 2 weeks prior to surgery. Postoperatively she developed vomiting accompanied by metabolic acidosis with persistent ketosis, requiring ICU admission. She was put on continuous insulin and dextrose infusion and subsequently referred to our dietitian, aiming for total calorie intake of 800 kcal/day. Glucose was well controlled in the ward with eventual resolution of acidosis and ketosis. She was discharged well.

RESULTS
We illustrated 2 cases of euglycemic DKA: one was precipitated by SGLT2i use and the other by prolonged starvation with severe carbohydrate restriction prior to bariatric surgery.

CONCLUSION
High clinical suspicion is required to diagnose euglycemic DKA, as normal blood glucose levels masquerade the underlying DKA and may cause a delay in diagnosis and institution of appropriate therapy.

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Giant Parathyroid Adenoma versus Parathyroid Carcinoma: Two Case Reports and Literature Review

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INTRODUCTION
Primary hyperparathyroidism is not an uncommon disorder in our region. Eighty to 90% of cases of primary hyperparathyroidism are due to solitary parathyroid adenoma, with only 1% due to parathyroid carcinoma. Giant parathyroid adenoma is defined by a tumor weight or >3.5 g. Parathyroid carcinoma should also be considered in patients with giant adenoma.

METHODOLOGY
Case 1 is a 78-year-old Chinese lady, with underlying hypertension and breast cancer in remission. She presented with dizziness and mild hypercalcemic symptoms. Serum calcium level was 3.61 mmol/L, with intact parathyroid hormone (iPTH) level of 88.2 pmol/L. Neck ultrasonography showed a large right inferior pole parathyroid adenoma, measuring 5.5 cm x 3.0 cm x 6.6 cm. Intraoperatively, a large parathyroid gland weighing 38 g was resected and reported as parathyroid carcinoma with soft tissue and vascular invasion. She developed mild hypocalcemia postoperatively. Case 2 is a 19-year-old Malay lady who presented with bilateral pathologic fractures of the hip and severe hypercalcemic symptoms. Elevated serum calcium (4.18 mmol/L) and iPTH (186 pmol/L) levels were noted. Neck ultrasonography revealed a left parathyroid adenoma measuring 2.2. cm x 1.5 cm x 3.5 cm. Intraoperatively, a 7 g parathyroid gland was resected, which was subsequently reported as parathyroid adenoma. Postoperatively, she developed hungry bone syndrome with prolonged hospital stay (16 days). Repeated iPTH and serum calcium done 6 weeks postoperatively were normal for both patients.

RESULTS
Giant parathyroid adenoma is a rare entity with distinct manifestations, but may also be asymptomatic. Patients have higher preoperative serum calcium and iPTH levels, with significant occurrence of symptomatic postoperative hypocalcemia, as presented by Case 2. On the other hand, parathyroid carcinoma should also be suspected in a patient with an unusually large tumor, higher serum calcium (>3.5 mmol/L) and iPTH (10 times the normal upper limit) levels, as in Cases 1 and 2. Histopathologic examinations will confirm parathyroid carcinoma.

CONCLUSION
It is important to suspect both cases parathyroid carcinoma or giant adenoma as this will determine the surgical and further management.