Diabetes Mellitus: The unusual complication of parathyroidectomy

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INTRODUCTION

Hypercalcaemia and primary hyperparathyroidism are associated with increased insulin resistance and hyperinsulinaemia. There have been several case reports showing that glycaemic control was improved in patients with both type 1 and type 2 diabetes mellitus following parathyroidectomy. However, hyperglycaemia or diabetes following parathyroidectomy has only been reported once in the literature.

CASE REPORT

A 64 year old female presented to the acute medical take with hypercalcaemia. She had a three weeks history of polyuria, polydipsia, constipation, intermittent abdominal pain and feeling depressed. She also reported weight loss of 3.5Kg over the previous six months. She denied symptoms of dysphagia, dyspnoea, haemoptysis, haematemesis or malaena.

Her past medical history included anaemia, ischaemic heart disease, chronic obstructive pulmonary disease and uterine prolapse. She was an ex-smoker with 45 pack-year history. She drank 10 units of alcohol.

On clinical examination she was found to be clinically dehydrated but was otherwise unremarkable.

Investigations revealed:

Corrected Calcium	3.35mmol/l
Parathyroid hormone	28.9pmol/l
Vitamin D	39.4ug/l
Random glucose	6.9mmol/l
Na	138mmol/l
K	4.2mmol/l
Ur	5.5mmol/l
Cr	63umol/l

Parathyroid sestamibi scan showed focal uptake in the inferior left thyroid lobe (*Figure 1*).

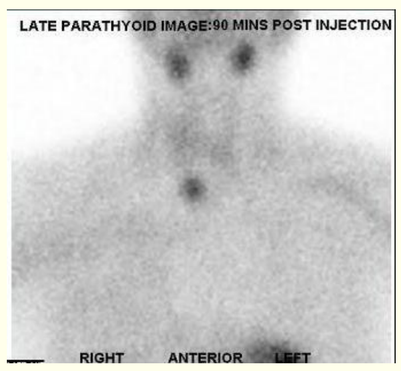

Figure 1. Parathyroid sestamibi scan showing focal uptake in the inferior left thyroid lobe.

CASE REPORT

The initial diagnosis made was of primary hyperparathyroidism. However, the biopsy following the parathyroidectomy showed a likely parathyroid carcinoma.

Two months later, her symptoms of polyuria and polydipsia returned. At this time the calcium (2.49mmol/l) and PTH levels (2.6pmol/l) were normal. However, her blood glucose level was 49.1mmol/l with an of HbA_{1c} 145mmol/mol. Her BMI was 23Kg/m^2. She was consequently started on insulin; basal bolus regime. Though the patient did not have any symptoms or signs of pancreatitis, this was suspected as a cause of Diabetes. Subsequent investigations including CT scan were normal.

Four months after, her insulin requirements decreased dramatically (Novorapid 2 units BD and Glargine 4 units; HbA_{1c}: 46mmol/mol) and was stopped.

Subsequently, after ten months she was still off insulin with an HbA_{1c} of 43mmol/mol.

CONCLUSION

As mentioned previously, it is known that both high parathyroid hormone and hypercalcaemia can increase insulin resistance resulting in compensatory hyperinsulinaemia. Transient reduction in insulin secretion has been demonstrated in post-parathyroidectomy patients, however onset of insulin requiring diabetes has only been reported in once in the literature.

Our patient clearly demonstrates the relative insulin deficiency following parathyroidectomy resulting in diabetes mellitus. It is possible that this was triggered by transient impairment of pancreatic beta cell function. The association between calcium, parathyroid hormone and insulin has been well demonstrated however the mechanism of association is still uncertain.

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