CASE REPORT

An insulinoma presenting as hypoglycaemia associated with exercise stress testing

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SUMMARY

A 68-year-old man presented to the accident and emergency department with a history of central chest pain associated with exertion. He was admitted for assessment and when an acute coronary syndrome was excluded, he underwent exercise stress testing. His exercise stress testing was discontinued due to lightheadedness. His capillary glucose was checked and it showed hypoglycaemia (2.2 mmol/l). In light of this, a 72 h supervised fast was performed and it became positive within 24 h with low plasma glucose, inappropriately high insulin and C peptide levels. Sulfonylurea screen was negative. CT, MRI and endoscopic ultrasound revealed a 2 cm pancreatic tail insulinoma. He underwent successful surgical enucleation of this lesion.

BACKGROUND

We present this novel unusual manifestation of insulinoma identified during work-up of chest pain. He developed symptomatic hypoglycaemia during exercise stress testing causing premature discontinuation of an exercise stress test.

CASE PRESENTATION

A 68-year-old male farmer presented with increasing frequency and severity of chest pressure like pain related to strenuous physical activity. Unusually, it also occurred with prolonged fasting. In addition, onset of chest pain was often associated with pre-syncope symptoms of lightheadedness. His symptoms improved immediately with rest and also with ingestion of sugary drinks. Physical examination was unremarkable.

INVESTIGATIONS

Repeated ECG and cardiac biomarkers were all within normal limits as was 24 h telemetry. After exclusion of an acute coronary syndrome, he underwent exercise stress testing. His exercise stress test was stopped prematurely, owing to symptoms of lightheadedness and abnormal generalised paraesthesia. His capillary glucose was checked immediately and measured 2.2 mmol/l prompting consultation with an endocrinologist and further investigation. His symptoms resolved with correction of his glucose.

A 72 h supervised fast was performed and became positive within 24 h with low plasma glucose (2.1 mmol/l), inappropriately high insulin (3.61 mU/l) and C peptide levels (2.99 µg/l). Sulfonylurea screen was negative. In retrospect, his

Figure 1 Endoscopic ultrasound of the pancreas showing a discrete lesion immediately outside the duodenal wall at the D1/D2 junction.

capillary glucose was checked in the emergency department chart and was noted to be 2.7 mmol/l.

Imaging studies with endoscopic ultrasound, CT and MRI cholangiopancreatography (figures 1–3) demonstrated a 2 cm insulinoma in the tail of the pancreas.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of a mass lesion within the pancreas includes microcystic adenoma, primary pancreatic neoplasm, secondary metastases

Figure 2 Triphasic CT scan of pancreas showing an abnormal enhancement of 2 cm exophytic lesion in the tail of pancreas consistent with an insulinoma.

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Figure 3 A high signal of T2-weighted MRI of the pancreatic tail of same lesion.

to pancreas and, rarely, sarcoma and paraganglioma.

TREATMENT

He was referred for definitive treatment and underwent a laparoscopic enucleation of the lesion in tail of pancreas.

Histology of this lesion confirmed a fully excised benign insulinoma confined to the pancreas.

OUTCOME AND FOLLOW-UP

Postoperatively, he had full resolution of all his symptoms and remains symptom-free on follow-up.

DISCUSSION

Insulinoma is a rare pancreatic islet tumour with an annual incidence of 1–4 cases/million.^{1 2} An islet cell tumour was first described in 1902 predating the discovery of insulin.¹ Wilder first described it in 1927 and the first described surgical resection was by Graham in 1929.³ Insulinoma arises from cells of the ductular or acinar system of the pancreas. Most cases are sporadic. Some cases are associated with multiple endocrine neoplasia type 1.⁴

Insulinomas are primarily associated hypoglycaemia causing neuroglycopenic symptoms with or without sympathoadrenal symptoms. Neuroglycopenic symptoms include confusion, lethargy, stupor or coma, bizarre behaviour, personality change, amnesia, transient neurological deficit and gradual decline in cognition. Diaphoresis, tremor, palpitations, anxiety, weakness

and visual disturbance are common sympathoadrenal symptoms described. Chest pain presentation of insulinoma, however, is rare. The symptoms are normally related to fasting or exercise and relieved by glucose administration. This patient met Whipple's triad with symptoms consistent with hypoglycaemia, a low plasma glucose measurement and relief of symptoms after the plasma glucose is raised.

Definitive treatment is surgical resection of the insulinoma if possible. More than 87% of patients are asymptomatic 6 months after surgical treatment with 8% of patients having persistent hypoglycaemia; 5% go on to develop diabetes mellitus. Overall, insulinoma has a 97% 5-year survival rate.³

As per the author's knowledge, there have been no previous descriptions of an insulinoma presenting as symptomatic hypoglycaemia causing discontinuation of an exercise stress test in the literature.

Learning points

- ▶ Insulinoma rarely may present as central chest pain.
- ▶ Premature discontinuation of exercise stress testing due to syncopal symptoms may be due to hypoglycaemia. Investigation of this may reveal a reversible cause.
- ▶ As per the authors' knowledge, this is the first case report of insulinoma diagnosed after identification of symptomatic hypoglycaemia precipitated by exercise stress testing.

Competing interests None.

Patient consent Obtained.

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