CASE REPORT

Refractory hypoglycaemia in patient with gastric outlet obstruction

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Accepted 27 November 2014

SUMMARY

A 68-year-old male with a longstanding history of severe gastric outlet obstruction secondary to peptic stricture was found unconscious at home with profound hypoglycaemia. He denied history of fasting, diabetes mellitus or use of hypoglycaemic agents. Systemic examination and metabolic profile were unremarkable. Hypoglycaemic episodes persisted during hospitalisation, requiring continuous intravenous dextrose and eventually diazoxide. Further investigative work up, including 72 h fasting study, revealed a hyperinsulinemic state. MRI and endoscopic ultrasound were unremarkable but mesenteric angiography with hepatic venous sampling revealed a subtle area of hypervascularity in the head of pancreas. An exploratory laparotomy was then performed and resulted in resection of a nodular lesion in the head of pancreas with retrocolic gastrojejunostomy for repair of pyloric stenosis. Histopathology of pancreatic nodule confirmed nesidioblastosis. Postoperatively the patient was weaned of parenteral dextrose and did not have any further episodes of hypoglycaemia.

was achieved with addition of diazoxide and parenteral nutrition.

INVESTIGATIONS

Two separate 72 h fasting studies revealed low blood glucose levels (23 mg/dL and 44 mg/dL), high insulin levels of 16 μ U/mL and 7.4 μ U/mL (expected <3 μ U/mL), high proinsulin, 6.9 pmol/L and 6.2 pmol/L (expected <0.2 pmol/L), high c-peptide, 6.4 ng/mL and 4.4 ng/mL (expected <0.2 ng/mL) and low β -hydroxybutyrate, 0.5 mg/dL and 0.4 mg/dL (>2.7 mg/dL). Sulfonyleurea levels and antibodies to human/ beef/ porcine insulin were negative. Insulin-like growth factor-2 levels (56 ng/mL) were not elevated (75–212 ng/mL). Thyroid and adrenal dysfunction were also ruled out. A contrast MRI and endoscopic ultrasound failed to show any pancreatic lesion. A mesenteric angiography and selective hepatic venous sampling was performed. Only a subtle area of hypervascularity within the head of pancreas was noted. The venous sampling before and after selective intra-arterial stimulation with calcium gluconate showed diffuse release of insulin (figure 1).

BACKGROUND

Hypoglycaemia is a common medical emergency frequently associated with oral hypoglycaemic agents/insulin therapy. However, the aetiology often remains elusive when hypoglycaemia is encountered in the setting of hyperinsulinemic states in patients without diabetes. Nesidioblastosis is one such rare cause of persistent hyperinsulinemic hypoglycaemia in adults. It was originally described by Laidlaw as neo-differentiation of Islets of Langerhans from pancreatic ductal epithelium.¹

CASE PRESENTATION

We present the case of a 68-year-old man with a longstanding history of gastric outlet obstruction secondary to peptic stricture. He was found unconscious at home. When Emergency Medical Services arrived at his home, he was found to have a blood glucose of 23 mg/dL. Administration of parenteral dextrose resulted in complete recovery. He denied history of fasting, diabetes mellitus, use of oral hypoglycaemic agents, insulin or herbal products. He was brought to the hospital for further investigation. Systemic examination, including vital signs after recovery, was unremarkable. Basic blood investigations revealed normal metabolic and haematological profiles. However, frequent episodes of hypoglycaemia of unclear aetiology during hospital stay despite adequate oral intake warranted continuous intravenous dextrose infusion. Normoglycaemia

DIFFERENTIAL DIAGNOSIS

- At this point, there were two main differential diagnoses for this patient's hyperinsulinemic hypoglycaemic state. Insulinoma versus Nesidioblastosis.
- Thyroid and adrenal insufficiency were also in differential but were ruled out by normal axis.

TREATMENT

The patient eventually underwent an exploratory laparotomy. Intraoperative ultrasound also failed to identify any definitive mass but a small area of nodularity was noted on direct palpation of the pancreatic head that was resected. The pyloric stenosis was repaired with a retrocolic gastrojejunostomy. Histopathological examination of the resected specimen showed benign pancreatic tissue with diffuse proliferation of islet of Langerhans which were strongly highlighted by neuroendocrine markers chromogranin and synaptophysin, consistent with nesidioblastosis. Postoperatively, the patient was weaned of parenteral dextrose and nutrition. He tolerated oral intake well without any more episodes of hypoglycaemia.

OUTCOME AND FOLLOW-UP

One year postsurgery, patient continues follow-up in the outpatient setting without any further evidence of hypoglycaemia.

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To cite: Manocha D, Shah R, Vaidya GN, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-207279

Figure 1 Diffuse increase in peak hepatic venous insulin in Selective Arterial Calcium Stimulation Test.

DISCUSSION

Nesidioblastosis—diffuse β -cell hyperplasia along with proliferation and hypertrophy of islet cells in the pancreatic duct is a rare cause of persistent hypoglycaemia in adults, accounting for 0.5–7% cases.² Although pathogenesis is incompletely understood, an underlying genetic defect associated with mutations in the genes encoding the KATP channel on chromosome 11p14–15.1 is identifiable in about 50% cases.³ A majority of cases reported were found in patients who have undergone bariatric surgery. Factors such as postoperative changes in glucagon-like peptide and ghrelin, postsurgical architectural changes, rapid weight loss and unmasking of subclinical disease due to loss of insulin resistance^{4 5} could be responsible. To the best of our knowledge, no previous case of nesidioblastosis has been reported in a patient with longstanding, non-malignant, gastric outlet obstruction. Although the exact pathophysiology in our patient remains unclear, assumption was that longstanding impaired gastric tying altered enteric neuroendocrine balance which in turn was responsible for islet cell hyperplasia. Surgical resection of the focal pancreatic lesion achieved adequate remediation of patient's presenting symptoms. Also, bypass of the outlet obstruction and significant restoration of gastric emptying enabled the patient to maintain normoglycaemia state in the postoperative follow-up.

Patient's perspective

- ▶ Nesidioblastosis is a rare condition which can lead to low blood sugar. It is even more rare to be diagnosed in an adult.
- ▶ I was lucky enough to be diagnosed early and by proper treatment all further harmful consequences could be avoided.

Learning points

- ▶ Hyperinsulinemic hypoglycaemia could be due to insulinoma or nesidioblastosis.
- ▶ Although nesidioblastosis is a genetic disease and most commonly diagnosed in paediatric population, it might present in adults/adolescents.
- ▶ Thyroid and adrenal insufficiency should be evaluated in all cases, for example, persistent hypoglycaemia.

Contributors DM, RS and GNV contributed to literature search and the writing-up of the manuscript. NB aided in diagnosing the condition and supervised/edited the manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Laidlaw GF. Nesidioblastoma, the islet cell tumor of the pancreas. *Am J Pathol* 1938;14:125–34.
- 2 Witteles RM, Straus IF, Sugg SL, et al. Adult-onset nesidioblastosis causing hypoglycemia: an important clinical entity and continuing treatment dilemma. *Arch Surg* 2001;136:656–63.
- 3 Thomas P, Ye Y, Lightner E. Mutation of the pancreatic islet inward rectifier Kir6.2 also leads to familial persistent hyperinsulinemic hypoglycemia of infancy. *Hum Mol Genet* 1996;5:1809–12.
- 4 Cummings DE. Gastric bypass and nesidioblastosis—too much of a good thing for islets? *N Engl J Med* 2005;353:300–2.
- 5 Patti ME, McMahon G, Mun EC. Severe hypoglycaemia post-gastric bypass requiring partial pancreatectomy: evidence for inappropriate insulin secretion and pancreatic islet hyperplasia. *Diabetologia* 2005;48:2236–40.

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