Diagnostic Challenges of an Insulinoma in a Healthcare Worker

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Introduction

Insulinomas are the most common cause of hypoglycemia related to endogenous hyperinsulinism. However, they represent a rare cause of hypoglycemia in the general population, with an incidence of 1-4 people per million individuals per year. Symptoms include diaphoresis, palpitations, tremors and even confusion or behavioral/personality changes.[1] Given their generally small (<2 cm) size, standard imaging techniques may not be able to confirm their localization in all cases posing diagnostic challenges.[2]

Case Report

A 47-year-old healthcare worker with a history of goiter presented with 6 months of memory problems and associated lightheadedness, tremors, and blurry vision. She endorsed a 15-pound weight gain in 1 month. She also recalled lapses in memory such as forgetting where she parked her car at the grocery store and, more dangerously, whether she administered medications to patients appropriately at work. Such symptoms had been ongoing for 2 years. An initial workup revealed a mildly elevated C-peptide, a normal IGF-2, TSH, and cortisol, and negative insulin antibodies and sulfonylurea screen. Physical examination was unremarkable. A Magnetic Resonance Imaging (MRI) of the pancreas showed no abnormalities and she was subsequently admitted to our hospital for a 72-hour fast. The test was terminated after 22 hours due to symptomatic hypoglycemia that resolved after administration of glucagon with resultant increase of 36 mg/dL in blood glucose concentration. Laboratory tests obtained at that time were consistent with hyperinsulinemia due to insulinoma (Table 1). However, a Computerized Tomography (CT) of the abdomen showed no enhancing pancreatic mass or metastatic lesions. Thus, the patient underwent endoscopic ultrasound (EUS) fine-needle aspiration which identified an 8x5 mm lesion in the tail of the pancreas. Pathology showed a well-differentiated neuroendocrine tumor, and the patient underwent radiofrequency ablation (RFA). Four months later, the patient was no longer symptomatic and had no biochemical evidence of hyperinsulinemia on laboratory evaluation.

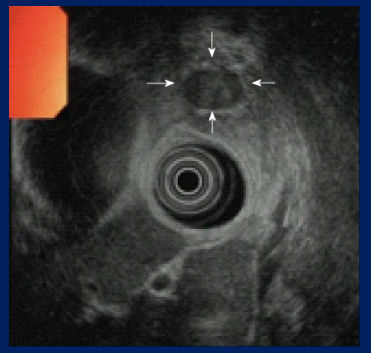

Figure 1. Endoscopic ultrasound featuring a homogenously hypoechoic, rounded insulinoma.[1]

	Diagnostic Criteria	Patient
Blood glucose (mg/dL)	< 45	45
Plasma insulin (µU/mL)	≥ 6	9.02
C-peptide (nmol/l)	≥ 0.2	1.4
Proinsulin (pmol/l)	≥ 5	59.6
Sulfonylurea screen	Negative	Negative

Table 1. Diagnostic criteria for an insulinoma during a prolonged, supervised fast[2] and our patient's laboratory values during a supervised fast terminated at 22 hrs.

Discussion

- Diagnosing insulinomas can be very challenging for several reasons, including their rarity in the general population, low specificity of symptoms, and small tumor size.
- The size of such tumors may be small enough to prevent detection with the most common imaging techniques.
- Although most insulinomas are benign and carry a 95% survival rate, they require radiofrequency ablation or surgical intervention.
- Diagnosis of an insulinoma requires biochemical evidence of endogenous insulin-mediated hypoglycemia with the concurrent exclusion of other causes, which typically requires a period of prolonged supervised fasting.
- Once such biochemical evidence has been demonstrated, localization of the tumor is required.
- Accurate localization of smaller tumors may be challenging and require additional studies, such as endoscopic ultrasound (sometimes with fine-needle aspiration biopsy of detected tumors) or selective arterial calcium stimulation.[3]

References

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