Image of the Month

Insulinoma

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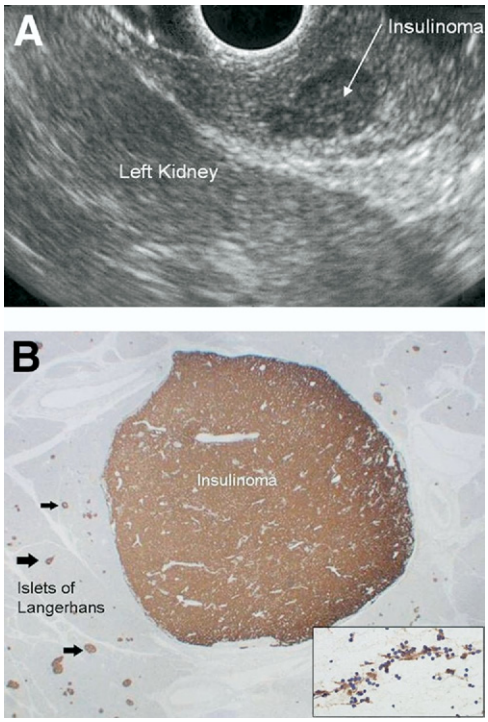

A 48-year-old woman was referred for further evaluation of a suspected insulinoma. Her past medical history revealed recurrent nonfasting hypoglycemic stages (glucose levels <2 mmol/L; ie, 35 g/dL), with increasing frequency for the past year. The patient experienced neuroglycopenic symptoms such as dizziness and loss of consciousness while driving. Neurologic consult showed a nonspecific examination and regular basic alpha activity on electroencephalogram. At a glucose level of 1.04 mmol/L (ie, 19 mg/dL), pancreatic function was assessed and showed a normal insulin level of 127 pmol/L (range, 35–235 pmol/L; ie, 17.7 μIU/mL; range, 5–30 μIU/mL), a C-peptide level at the upper limit of normal (1023 pmol/L; range, 260–1200 pmol/L), and a normal fasting basal cortisol level of 348 nmol/L (range, 170–800 nmol/L). Surreptitious use of oral hypoglycemic agents or insulin was denied. On admission, clinical and laboratory examination showed no pathologic findings, except for hypoglycemia (1.5 mmol/L; resp, 27 mg/dL). We completed diagnostic testing with blood tests for sulfonylurea (negative result) and measurement of proinsulin, which was increased (26 pmol/L, upper limit of normal <11 pmol/L), thus suggesting an insulinoma. On abdominal ultrasound, a questionable isoechogenic mass of 12 × 16 mm was visualized in the pancreatic tail. Endoscopic ultrasound revealed a 7 × 11 mm mass (Figure *A*) and endoscopic ultrasound–guided fine-needle aspiration smear confirmed an endocrine tumor, composed of a monotonous population of medium-sized cells with round hyperchromatic nuclei and the characteristic coarse, stippled, salt-and-pepper chromatin (Figure *B*). Immunolabeling for synaptophysin (insert on Figure *B*), a marker of the neuroendocrine phenotype, was positive. Multiple endocrine neoplasia 1 was excluded clinically by normal results for fasting cortisol, prolactin, folic stimulating hormone, luteinizing hormone, thyroid stimulating hormone, free thyroxine, and parathyroid hormone. Abdominal magnetic resonance imaging and computerized tomography images of the liver, pancreas, thorax, and neck showed no metastases. The patient underwent pancreatic resection (laparotomy), and recovery was uneventful.

Insulinoma is a rare condition (0.4 per 100,000 person-years), but has to be considered if fasting glucose levels fall below 45 mg/dL, accompanied by inappropriate hyperinsulinemia (insulin >5–6 μU/mL). It almost always arises from pancreatic islet cells, most often from a solitary and benign lesion. Insulin-producing tumors located outside the pancreas are rare. According to the Mayo Clinic Case Series,[1] 8% of patients have multiple endocrine neoplasia 1 syndrome, often associated with multiple pancreas tumors. Gross local invasion and metastatic disease, which occurs in 6% of patients, most commonly metastatic to the liver and lymph nodes, are the only unequivocal evidence of malignancy. Localization of the primary tumor fails in 40% to 60% of patients but can be improved by endoscopic ultrasound (sensitivity, 82%).[2] Further imaging techniques include arterial calcium stimulation with venous sampling but are reserved for complex cases. After surgery, the recurrence rate of hypoglycemia is 11%.

If surgery fails, a medical trial with diazepoxide or somatostatin analogs (octreotide, lanreotide) can be tried.

References

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