Woman with endogenous hyperinsulinism.

Imaging Findings:

A 68-year-old woman presented with a 2-year history of recurrent episodes of weakness, blurred vision, diaphoresis and syncope, which became worse with fasting and were relieved with eating. The medical history revealed a treated high-blood pressure and smoking habits. There was no previous history of surgery, nor intake of oral hypoglycemic agents. Laboratory analysis data showed low serum glucose levels (37mg/dl), concomitant with high serum insulin (36mU/l) and high C-peptide (5 ng/ml) levels. The patient was submitted to one prolonged supervised fasting test, in which the serum glucose levels were in the range of 40mg/dl, 6 hours after the onset of the fast. The patient underwent a CT scan of the abdomen (pre-contrast and contrast-enhanced, obtaining both arterial and venous phases, with a 5mm-colimation in a caudocranial direction). Precontrast CT only showed a contour abnormality in the junction of pancreatic body and tail. However, in the arterial and venous phases, a well-defined and rounded mass, measuring 16x15mm, with a typical ring-like enhancement was observed. Gathering the clinical and CT scan findings, insulinoma was the final diagnosis. The patient was referred for a curative surgery.

Discussion:

Endocrine pancreas is formed of islet cells, which are clustered into islets of Langerhans. There are several types of islet cells within the islets, each of which produces a different major secretory product. As such, the majority of islet cell tumors release at least a small amount of hormones and are classified as non-functioning (if the hormonal activity remains below the threshold of clinical symptoms and biochemical detection) or functioning (resulting in a clinical endocrinopathy and are detected earlier). Insulinomas are the most common islet cell tumors (affecting the insulin-secreting B-cells(β-cells), which are the predominant cell type in the islets (nearly 80%)) and the most common cause of hypoglycaemia resulting from endogenous hyperinsulinism. The tumor usually presents with M=F and occurs predominantly in the 4th-6th decades, but all ages can be affected. In the majority of cases (90%), insulinomas are benign and solitary lesions, but multiple tumors may coexist, a finding that must prompt an investigation for MEN1. Almost 10% of the tumours are malignant, as determined by the presence of metastases and gross invasion. The clinical diagnosis is based on the Whipple’s triad: 1) symptoms and signs of hypoglycaemia, 2) low fasting glucose and 3) reversibility of symptoms upon administration of glucose. Besides the adrenergic symptoms (palpitations, tremor, hunger, diaphoresis), patients may present with neuropsychiatric symptoms related to neuroglycopenia (blurred vision, seizures, confusion, transient focal deficit), with often confuse and delay the diagnosis. The role of the radiologist in these patients is mostly the preoperative localization of the tumor (as the mean size of functioning insulinomas is less than 15mm). No single study is perfect, having all methods of localization their own limitations. In this case, we used CT: Insulinomas typically appear as sharply-defined, round or oval, enhancing masses of the pancreas at CT. Because they are frequently hypervascular and enhance during the
early vascular phases to a greater extent than the surrounding tissue, CT arterial phase imaging might be the ideal method. As much as 50% of the lesions (including our own case), can have a solid/ring enhancement, which is more pronounced in the delayed scan. The precontrast scan has a limited role, as small lesions are usually undetectable, and are isodense before the administration of iv contrast. Some lesions however, can show a contour abnormality. However, atypical presentations of insulinomas have been described: cystic, calcified, hipotenuanting on dynamic CT. In these cases, it is important to keep the clinical history in mind. Once the tumor is localized by the radiologist, the patients are able to go to a curative surgery.

Differential Diagnosis List: Insulinoma (pancreatic islet cell tumor)

Final Diagnosis: Insulinoma (pancreatic islet cell tumor)

References:

Description: Precontrast CT only showed a contour abnormality in the junction of pancreatic body and tail, since the small mass was isodense to the surrounding pancreatic tissue (before iv contrast administration) Origin:
Figure 2

Description: In the arterial phase, a sharply-defined and rounded mass, measuring 16mmx15mm, with a typical ring-like enhancement, was observed in the junction of pancreatic body and tail. Origin:
Description: In a slightly later scan (venous scan), the lesion still shows the same enhancement pattern, with the ring-like enhancement Origin: