Genitourinary & Gastroenteropancreatic neuroendocrine tumors
Pancreatic NET

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Background:

• 1.5% of all gastrointestinal and pancreatic neoplasms.
• 1-2% of genitourinary malignancies.
• Pancreatic NETs account for 10% of pancreatic neoplasms.
• 30% of neuroendocrine tumors (NETs) occur in the ileum, followed by appendix and stomach.
Pancreatic NET

• Majority are non-functioning and malignant (60-80%) diagnosed by mass effect.

• Functioning tumors mostly include insulinoma and gastrinoma. Insulinomas are usually in pancreas unlike gastrinomas which are in duodenum. Multiple tumors have a strong association with MEN and Zollinger syndromes.

• Glucogonomas are rare but with liver metastasis in 60% of cases at diagnosis.
Case 1: Patient with hypoglycemia: Insulinoma

Axial T2 FS: Image demonstrates a rounded lesion in the uncinated process with intermediate signal (arrow).

Axial T1 FS pre and post contrast SPGR: Image demonstrates a rounded low T1 lesion in the uncinated process with avid early arterial enhancement relative to background pancreatic tissue after contrast.

Axial DWI: Image demonstrates focal restricted diffusion in the lesion.
Case 2 & 3: Companion Gastrinoma and Cystic NET

**Case 2: Gastrinoma**
Axial T1 pre and post SPGR: Image demonstrates a rounded lesion in the 2\textsuperscript{nd} portion of duodenum with avid arterial enhancement (arrow).

**Case 3: Cystic NET**
Axial T2 FS: Image demonstrates a rounded lesion in the retro peritoneum with central cystic degeneration and a rim of intermediate signal.

Axial post contrast subtraction image demonstrates avidly enhancing rim.
Pancreatic NET: Imaging Features

• Multiphase CT is an acceptable first line of imaging test. MR imaging has an overall sensitivity of 74%–94% and specificity of 78%–100%.

• Functioning tumors like insulinomas are small, hyper vascular unlike the non-functioning NET’s which are larger (mean 4cm) with heterogeneity.

• Cystic degeneration centrally with peripheral rim of hypervascularity is common as well.

• Aggressive NET present with liver metastasis, calcifications, retroperitoneal and vascular invasion.

• Sensitivity for detection of pancreatic non-functioning NETs ranges from 75% to 100% but is lower (14%–53%) for insulinomas because they insufficiently express SSTRs (50%–60%).
References: