40 year old man presented with increasing frequency of hypoglycemic spells for last 9 months. CT scan showed a 1.8 cm nodular area in the head of pancreas.

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Pancreatic neuroendocrine tumor (PanNET)

Key Facts

- **Epidemiology**

- **Key cytomorphological features**

- **Ancillary studies and Differential diagnosis**

- **References**
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Epidemiology:

- Pancreatic neuroendocrine tumors represents 1-2% of all pancreatic neoplasms.
- They occur at any age, but most between 40 and 60 years with men and women equally affected.
- Majority of PanNET are non-functional (i.e., non-syndromic).
- Functional tumors secrete one of the following hormones: insulin, glucagon, somatostatin, vasoactive intestinal polypeptide (VIP), pancreatic polypeptide, serotonin, adrenocorticotrophic hormone (ACTH), or calcitonin.
- Owing to excess hormone secretion, patients with a functional tumor can develop life-threatening signs and symptoms such as hypoglycemia (as seen in our case), GI ulcers, and diarrhea with dehydration.
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Key cytomorphological features:

- **Discohesive**, single-cell “solid-cellular” smear pattern
- **Uniform, monotonous population of cells** with **plasmacytoid** (eccentric nuclei) features (Fig A)
- **Round to oval nuclei** with coarse, speckled, “salt-and-pepper” chromatin pattern (Fig A. & C.)
- Nucleoli may be prominent
- Dense, **finely granular cytoplasm**
- Lipid-rich variant with finely vacuolated cytoplasm
- Oncocytic variant with abundant dense, granular oncocyctic cytoplasm
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• Ancillary studies and Differential diagnosis:
  - *Immunohistochemical stains* will usually suffice in *establishing a specific diagnosis*.
  - *Immunohistochemical stains supporting endocrine differentiation* (Synaptophysin, Chromogranin, CD56) is typically all that is needed to support the diagnosis of PanNET in cytologic specimens.
  - *Specific markers* for insulin, glucagon, somatostatin, and pancreatic polypeptide are variably positive; gastrin, vasoactive intestinal polypeptide, cholecystokinin, adrenocorticotropic hormone may occasionally be used but *are generally not necessary unless the patient is syndromic and labeling is requested for clinical correlation*.
  - The primary *differential diagnosis of PanNET is with other solid cellular neoplasms including acinar cell carcinoma, solid-pseudopapillary neoplasm, and pancreatoblastoma*.
  - Lipid-rich PanNETs must be differentiated from metastatic renal cell carcinoma.
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• References: