Symptomatic Insulinoma Successfully Treated with Endoscopic Ultrasound-Guided Ethanol Ablation

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Introduction

• Insulinoma
  • Functional pancreatic neuroendocrine tumors
  • Localized lesions with biochemically proven hyperinsulinemic hypoglycemia

• Surgical resection as a standard treatment
  • Alternative strategies if the surgery is inappropriate (e.g. ablation therapies.)
  • Endoscopic ultrasound (EUS)-guided ethanol ablation
Case

• 35-year-old healthy woman

• Recurrent hypoglycemia lasting for 3 months

• Laboratory findings
  • Fasting hypoglycemia (serum glucose level 55 mg/dL)
  • Normal serum insulin level (14.2 uIU/mL, normal range; 4-16 uIU/mL)
  • Normal C-peptide level (1.69 ng/mL, normal range; 0.48-3.30 ng/mL)

• Suspicion of insulinoma with hyperinsulinemic hypoglycemia
Case

- Anatomical location of an insulinoma was inconclusive on non-invasive imaging.

Figure 1. Non-invasive image findings of the patient. (A) The abdominal computed tomography and (B) magnetic resonance imaging showed no demonstrable focal lesion in the pancreas. (C) Gallium-68 labeled somatostatin analogue positron emission tomography/computed tomography revealed focal increased uptake at the pancreatic head with the possibility of physiologic uptake (white arrow).
Case

- Contrast-enhanced harmonic EUS revealed a 13 mm-sized isoechoic nodule with enhancing property.
- EUS-guided fine needle aspiration/biopsy was followed by 1mL of 99% ethanol injection at the lesion through a 22-gauge needle.

Figure 2. Endosonographic images. (A) Endoscopic ultrasound showed a 13 mm sized isoechoic nodule in the head of the pancreas. (B) Contrast-enhanced harmonic endoscopic ultrasound demonstrated an enhancement of the tumor (white arrowhead) after contrast injection. (C) After injecting 1 mL of ethanol using a 22-gauge needle, endoscopic ultrasound revealed hyperechoic infiltration (white asterisk) of the tumor.
Case

- Immunohistochemical evaluation of the specimen
  - Expression of synaptophysin, CD56, and insulin.
  - Consistent with the histopathologic findings of an insulinoma

Figure 3. Histopathologic findings. (A) Hematoxylin-eosin stain showing monotonous cells with round nuclei (hematoxylin-eosin stain, x100). (B-D) Immunohistochemical evaluations demonstrating positive stains for synaptophysin, CD56, insulin (B, synaptophysin stain, x100; C, CD56 stain, x100; D, insulin stain, x100).
Case

- Normalized serum glucose level right after the procedure
- Discharged without any complications
- Follow-up free of symptoms and radiologic recurrences for more than 2 years,
Discussion

• EUS-guided ethanol ablation
  • Alternative treatment of an insulinoma for the patients who are reluctant to or risky for the surgery
  • Minimal invasiveness, low complication rates, and short hospital days

• Localization of the lesion is an important prerequisite for the successful treatment
  • EUS is superior to other imaging modalities in detecting small-sized pancreatic tumors
  • Other advantages of EUS
    • Characterization of vascularity (contrast-enhanced harmonic EUS)
    • Pathologic confirmation (EUS-guided fine needle aspiration/biopsy)
    • Treatment (EUS-guided ethanol ablation)