# Treatment of a pancreatic endocrine tumor by ethanol injection (PEI) guided by endoscopic ultrasound

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**Fig. 1** Diagnosis of MEN-1 in July 2004.

**Fig. 2** Endoscopic ultrasound-guided fine needle aspiration.

We report the case of a female with MEN-1 (high plasma levels of both vasoactive intestinal polypeptide [VIP; 663.2 pg/mL] and CgA). Endoscopic ultrasound revealed two nodular hypoechoic lesions (**Fig. 1**), with a color Doppler hypervascular pattern located in the pancreas. We performed EUS-guided fine needle aspiration (FNA) biopsy [1] (**Fig. 2**), which was diagnosed as a neuroendocrine islet tumor in the pathology report 2 weeks later.

The patient was referred to our hospital because of nausea, weakness, abdominal pain, watery diarrhea, and hypokalemia. Because the patients strongly refused surgical therapy, she underwent percutaneous ethanol injection (PEI), under EUS guidance, into the nodule. At the same time, celiac plexus neurolysis was carried out to control abdominal pain.

Clinical, biochemical, and transabdominal ultrasonography controls indicated that the PEI session and the subsequent antibiotic treatment were well tolerated and produced no adverse effects. The patient was discharged from hospital 5 days later.

After the first PEI session, a second session following the same procedure was performed. Unfortunately, during needle retraction, minimal ethanol effusion caused a small pancreatic necrotic lesion, which was treated with laparoscopic necrosectomy. Two months later, and octreoscan and serum tests were carried out. VIP and CgA levels were normal. EUS with enhanced contrast detected areas of fibrosis [2]. At present, after a follow-up period of 18 months, the patient is asymptomatic, without recurrent disease; abdominal magnetic resonance imaging (MRI) is negative.

EUS is particularly useful in the assessment of small pancreatic tumors that have been missed by other imaging techniques [2–4]. EUS-FNA [1] is a gold standard in the management of pancreatic tumors. Unusually, we explore a new field of EUS that permits the injection of drugs directly into the tumor; in our experience, if surgical therapy is refused by the patient or contraindicated because of poor general health, EUS-guided PEI is a safe and effective treatment in neuroendocrine lesions, and can eliminate humoral symptoms.

PEI has been demonstrated to be a safe technique for the treatment of hepatic and thyroid lesions [5]. In our case we used the same technique to treat pancreatic lesions without the need for surgery, which has high morbility and mortality, and we reduced hospitalization time. A multicentric study is necessary to establish a standardized procedure for EUS-PEI in neuroendocrine pancreatic tumors.

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**Bibliography**
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