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Successful endosonography-guided radiofrequency ablation of pancreatic insulinoma

Short title: Endosonography-guided radiofrequency ablation of pancreatic insulinoma

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A 40-year-old male patient, with confirmed symptomatic insulinoma of the pancreas was qualified for an endosonography guided radiofrequency ablation (EUS-RFA) of the lesion. In August 2019 the patient had an episode of agitation, behavioral disorders and limosis. His basic blood tests revealed severe hypoglycemia and symptoms relived after consumption of a sweet meal. During diagnostic workup patient underwent an abdominal MRI (magnetic resonance imaging), which revealed a 9 mm focal lesion in the head of the pancreas. Endoscopic ultrasound confirmed the MRI finding and suggested a possible diagnosis of neuroendocrine tumor. Subsequently starvation test was performed, but had to be abandoned at the end of the first day due to hypoglycemia, accompanied by symptoms of neuroglycopenia and high concentration of insulin and C-peptide. Based on the overall clinical image and additional tests, a pancreatic insulinoma was confirmed. The treatment of choice for functional pancreatic neuroendocrine tumors should be surgical resection whenever possible [1]. The potential surgical resection would have been associated with a significant risk of mortality. There is also a risk of pancreatic insufficiency and diabetes after surgery. The patient made informed decision to undergo an alternative modality of treatment which was EUS-guided radiofrequency ablation. The above decision was also found acceptable due to the fact that insulinoma is benign in more than 90% cases and occurs very rarely as multiple lesions [2]. The patient underwent another endosonographic examination, confirming the presence of a well-delineated, highly vascular, hypoechoic lesion in the head of the pancreas, without infiltration of the surrounding vessels (Fig. 1A). Subsequently an RFA electrode was placed directly into the lesion under EUS guidance (Fig. 1B) and the radiofrequency ablation in three 10-second sessions with a power of 50 W was performed (Fig. 1C, 1D). The procedure resulted in the loss of vascular flow within the tumor feeding vessels in the eFlow option (Fig. 1E). The above procedure was complicated by an acute necrotizing pancreatitis with a moderately severe course. The patient made good recovery
with conservative treatment and his glycaemia remained within reference values. The RFA method itself is known for a long time. This technique uses the radio frequency current to produce thermal energy that causes tissue necrosis [3]. The anatomy of the pancreas and rich vascularization of its area have so far prevented the effective, targeted and safe use of the above technique. Recent development of therapeutic endosonography allowed to develop technique of pancreatic EUS-guided RFA. EUS-guided RFA allows precise delivery of antitumor treatment combining both tumor necrosis and enhancement of the immune response. In a prospective multicenter French study 14 pancreatic neuroendocrine tumors had been treated with RFA [4]. Twelve lesions completely disappeared (86% efficacy) when assessed at one year after procedure. Most complications are related to thermal injury to pancreatic parenchyma and surrounding structures including thermal damage to superior mesenteric vessels, bile ducts, stomach and duodenum [5]. It seems that the above technique will become a new much less invasive alternative to the current treatment of pancreatic neuroendocrine tumors in selected cases. However, we need more data about safety, long-term durability and clinical indications.
Figure 1. Endosonography-guided radiofrequency ablation

A – lesion, located in the head of the pancreas

B – the radiofrequency ablation electrode placed directly into the lesion

C – the radiofrequency ablation in first 10-second session

D – the radiofrequency ablation in third 10-second session

E – result of procedure
References


