Endoscopic ultrasound-guided radiofrequency ablation of a pancreatic neuroendocrine tumor

Radiofrequency ablation (RFA), a method of achieving tumor necrosis by cell protein denaturation that is induced by heating tissues to above 45 °C, is applied in the treatment of several malignancies. Energy is provided by an RFA current generator, which is connected to an active electrode needle that is placed into the tumor under image guidance. The lesions created have variable diameters, depending on the intensity of the current used, the active tip length, and the treatment duration [1]. Recently a novel RFA needle (EUSRA RF Electrode; STARmed, Koyang, Korea) has been developed for use under endoscopic ultrasound (EUS) guidance [2]. It is an 18G

water-cooled needle, with a long active tip of 5–30 mm (▶ Fig. 1), which is connected to a radiofrequency generator (VIVA RF generator; STARmed). A 76-year-old man was referred for treatment of a pancreatic nodule. His laboratory results were within the normal ranges. An abdominal computed tomography (CT) scan showed a hypervascular 20-mm nodule in the pancreatic tail. EUS-guided fine needle aspiration (FNA) revealed a pancreatic neuroendocrine tumor (pNET) with a Ki67 proliferative index of >5%, consistent with a G2 grading (▶ Fig. 2).

The patient refused to undergo surgical resection and we decided to treat the lesion by EUS-guided RFA. With the patient under general anesthetic, the nodule was ablated in a single session, with two passes of an exposed-tip needle (10-mm long) (▶ Video 1). Indometacin 100mg was administered via suppositories. The patient remained asymptomatic, with normal serum pancreatic enzymes, and was discharged on the third day. A CT scan and contrast-enhanced EUS performed after 1 month confirmed complete radiological ablation (▶ Fig. 3). No complications were observed and to date the patient remains free of disease. The recommended standard of care of pNETs is surgical resection of functioning nodules, and of large or high grade non-functioning nodules (>2 cm, G2–G3), with a burden of relevant costs and post-operative complications [3]. In this case EUS-guided RFA appeared feasible and

Fig. 1 The novel EUSRA radiofrequency ablation (RFA) needle, with a 10-mm active tip. The handle is connected to the water cooling device and to the VIVA RF generator.

Video 1

A screenshot of an endoscopic ultrasound (EUS) video. It shows a circular field of view with a large, dark, hypoechoic nodule in the center. A needle is visible, positioned to ablate the nodule. A large play button is overlaid on the image.

Endoscopic ultrasound (EUS) showing a nodule in the pancreatic tail being ablated by a water-cooled radiofrequency ablation (RFA) needle with a 10-mm exposed tip.

Fig. 2 Images of the nodule in the pancreatic tail on: **a** endoscopic ultrasound (EUS); **b** computed tomography (CT) scanning.

Fig. 3 Images taken 1 month after the endoscopic ultrasound (EUS)-guided radiofrequency ablation (RFA) showing: **a** on endoscopic ultrasound (EUS), a hypo/anechoic nodule; **b** on a computed tomography (CT) scan, a smaller round area without enhancement at the site of the previously ablated neuroendocrine tumor, consistent with necrotic tissue.

effective. This report adds to the increasing evidence of pNETs being successfully treated by ablative therapies, which may represent a potential alternative to surgery in selected cases [4–5].

Endoscopy_UCTN_Code_TTT_1AS_2AD

Competing interests: None

Elia Armellini, Stefano F. Crinò, Marco Ballarè, Pietro Occhipinti

Azienda Ospedaliero Universitaria
“Maggiore della Carità”, Novara, Italy

References

- 1 Goldberg SN. Radiofrequency tumor ablation: principles and techniques. *Eur J Ultrasound* 2001; 13: 129–147
- 2 Kim HJ, Seo DW, Hassanuddin A et al. EUS-guided radiofrequency ablation of the porcine pancreas. *Gastrointest Endosc* 2012; 76: 1039–1043
- 3 Partelli S, Maurizi A, Tamburrino D et al. GEP-NETS update: a review on surgery of gastro-entero-pancreatic neuroendocrine tumors. *Eur J Endocrinol* 2014; 171: R153–R162
- 4 Yoon WJ, Brugge WR. Endoscopic ultrasound-guided tumor ablation. *Gastrointest Endosc Clin N Am* 2012; 22: 359–369
- 5 Armellini E, Crinò SF, Ballarè M et al. Endoscopic ultrasound-guided ethanol ablation of pancreatic neuroendocrine tumours: a case study and literature review. *World J Gastrointest Endosc* 2015. In Press

Bibliography

DOI <http://dx.doi.org/10.1055/s-0034-1393677>
Endoscopy 2015; 47: E600–E601
© Georg Thieme Verlag KG
Stuttgart · New York
ISSN 0013-726X

Corresponding author

Elia Armellini, MD
Department of Gastroenterology
Azienda Ospedaliero Universitaria
“Maggiore della Carità”
Corso Mazzini 18
28100 – Novara
Italy
Fax: +39-321-3733345
elia_armellini@hotmail.com