

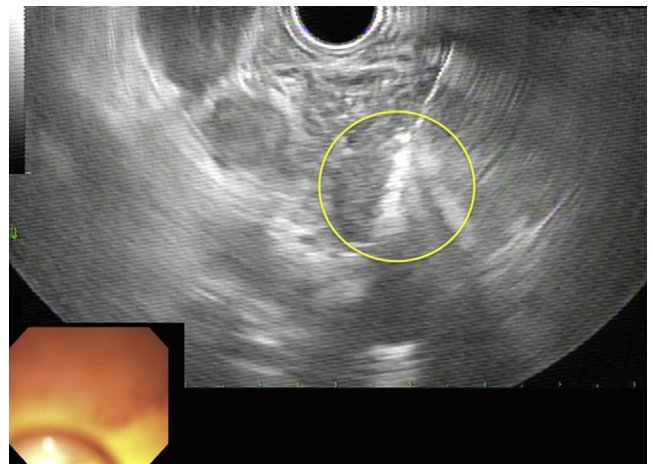


## EUS-guided radiofrequency ablation of a pancreatic neuroendocrine tumor

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Although radiofrequency ablation (RFA) has been well described in the treatment of Barrett's esophagus with dysplasia by inducing local thermal necrosis, its role through the use of EUS has garnered considerable interest over the past few years, particularly with pancreatic cysts and tumors. Although surgery remains the mainstay for solid pancreatic neoplasms, EUS-guided RFA offers a safe and effective treatment option in patients deemed unfit for, or who do not wish to undergo, surgery.<sup>1-4</sup> Here, we present a case of an 82-year-old woman with osteoarthritis who presented with progressively worsening upper-abdominal pain over the past month and accompanying weight loss. CT of the abdomen and pelvis at an outside hospital revealed a 2.6-cm hypoattenuating mass in the pancreatic head, with pancreatic ductal dilation and atrophic changes in the body and tail (Fig. 1). An EUS-guided fine-needle biopsy of the lesion was performed, and the result of pathologic analysis was consistent with a pancreatic neuroendocrine tumor (focal chromogranin, synaptophysin, and CD56 positive, Ki67<1). The patient was referred to an endocrine surgeon for consideration of a pancreaticoduodenectomy; however, she did not wish to undergo surgery and was interested in alternative treatment options. She was seen in the gastroenterology clinic and scheduled for EUS-guided RFA of the mass after a thorough discussion of the risks and benefits (Video 1, available online at [www.VideoGIE.org](http://www.VideoGIE.org)).

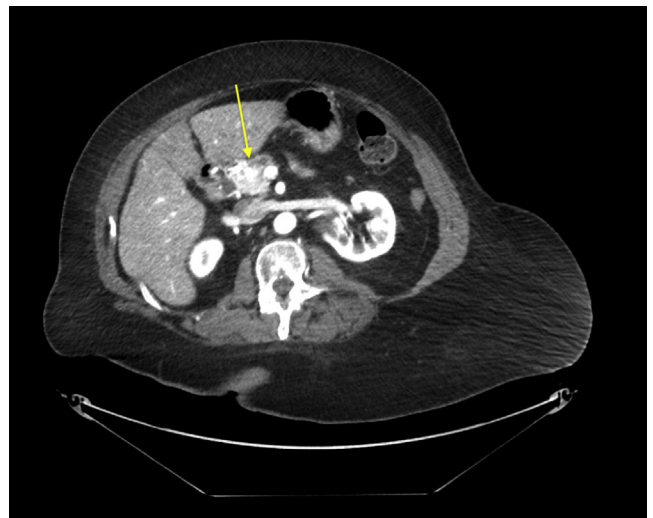
The patient received general anesthesia, and the procedure was performed while she was in the left lateral position. Fluoroscopy was not used for the procedure. A linear echoendoscope was used to identify the irregular, hypoechoic, well-defined pancreatic head mass. The novel EUSRA system with a 19-gauge needle electrode (Starmed;



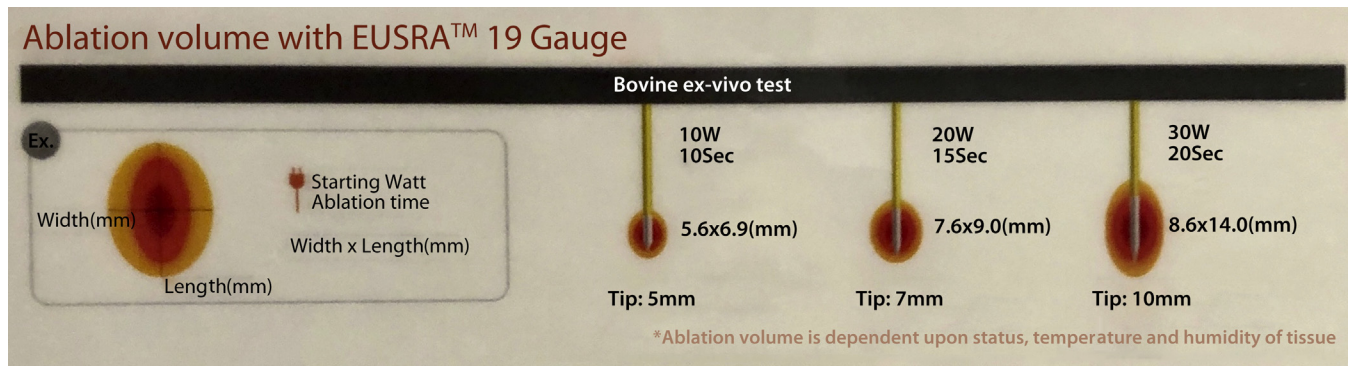
**Figure 2.** EUS view showing echogenic bubbling after radiofrequency ablation.



**Figure 1.** CT view of the abdomen and pelvis before the procedure (arrow, mass with necrosis).



**Figure 3.** CT view of the abdomen and pelvis 1 week after the procedure (arrow, mass with necrosis).



**Figure 4.** Ablation fields achieved by the use of different needle tip sizes.

Taewoong Medical, Gyeonggi, South Korea) was used. A 10-mm probe was used to perform RFA. Under EUS guidance, the needle electrode was passed into the target lesion, with the echogenic needle tip positioned at the far end of the lesion; 30 W was applied with the setting of continuance mode on the RF generator until 800 ohms impedance was reached (appearance of echogenic bubbles, Fig. 2) for 20 seconds, which achieved an ablation field of 8.6 mm × 14 mm. The catheter was primed with a chilled saline solution that was circulated through an internal pump within the generator to enhance the thermal ablation. After completion of ablation (indicated by the 2-tone chime alert), the needle was then redirected into another area of the lesion to repeat the ablation process.

The patient was discharged home after endoscopy without any adverse events. She did not describe experiencing abdominal pain, nausea, or vomiting a week after the procedure, and she continues to do well without any acute symptoms 2 months after the procedure. She underwent CT of the abdomen and pelvis that demonstrated improved tumor size and evidence of RFA-related necrosis within the lesion (Fig. 3).

In general, the risks of EUS-guided RFA appear to correlate to the duration of the ablation because the pancreas is incredibly thermosensitive. Potential adverse events include pancreatitis, pancreatic leak, peripancreatic fluid collection, massive pancreatic necrosis with infection, gastric or small-bowel wall injury, significant postprocedural bleeding, and portal or splenic vein thrombosis.

EUS-guided RFA is a minimally invasive, safe, and viable treatment option for patients with solid pancreatic tumors who do not wish to undergo surgery.<sup>2,5,6</sup> RFA certainly provides an exciting therapeutic nonsurgical option for patients; however, further studies that better elucidate the long-term outcomes with technique standardization will help define its role in the treatment of pancreatic tumors.

## DISCLOSURE

*Dr Sharaiha is a consultant for Boston Scientific, Olympus, and Cook. All other authors disclosed no financial relationships relevant to this publication.*

*Abbreviation: RFA, radiofrequency ablation.*

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