



Endoscopic Ultrasound Guided Radiofrequency Ablation of an Insulinoma

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Abstract

Neuroendocrine tumors such as insulinomas are most commonly treated by surgical resection. We present a case of a patient diagnosed with an insulinoma and treated by means of Endoscopic Ultrasound-Guided Radiofrequency Ablation (EUS-RFA).

Background

Insulinomas are rare neuroendocrine tumors found in the pancreas, with an occurrence of 1 in every 1-4 million people [1]. Patients often present with episodes of severe symptomatic hypoglycemia, along with confusion, diaphoresis, and sometimes seizures. While insulinomas are primarily treated through the means of surgical intervention, there are other options such as medical management through the use of somatostatin analogues such as octreotide. Additionally, there are minimally invasive techniques such as ethanol ablation, microwave ablation, and the option discussed in this case: EUS-RFA [2]. EUS-RFA of insulinomas is a novel technique that can allow for ablation of the tumor with the resolution of symptoms. This is done by inducing thermal injury and necrosis in targeted insulinomas [3]. We present a video case of a 41-year-old patient with severe recurrent hypoglycemia due to an insulinoma who was successfully treated with EUS-RFA. This method is a novel option that will allow for the treatment

of neuroendocrine tumors with minimally invasive treatments compared to its surgical counterparts used before this.

Case

A 41-year-old male was referred for evaluation of recurrent hypoglycemia with multiple syncopal episodes suspected to be secondary to insulinoma. An initial CT scan was nonrevealing. An Endoscopic Ultrasound (EUS) was arranged, which revealed a hypervascular tumor in the neck of the pancreas measuring approximately 13.5mm x 8.5mm, with increased echo transmission suggestive of a Neuroendocrine Tumor (NET). Fine-needle aspiration biopsy confirmed NET consistent with insulinoma. Surgical resection in the form of a Whipple operation was recommended, however, the patient had no form of health insurance and refused surgery due to financial constraints. EUS-RFA was arranged on a charity basis. RFA of the tumor was performed at 20 Watts using a 19G needle. Two applications at 20

seconds and 12 seconds led to the complete ablation of the tumor on EUS. During a 4-week follow-up, the patient had no further episodes of hypoglycemia. 4 months later, the patient remains asymptomatic.

Discussion

Insulinomas are a rare NET of the pancreas that can present as recurrent hypoglycemia and can lead to seizures and even brain damage. While surgical resection remains the treatment of choice, the specific type is based on the size of the NET. Enucleation is indicated for smaller tumors without the involvement of the main pancreatic duct. In addition, a Whipple procedure is indicated for larger tumors, the same procedure offered to the patient in this case [4]. In comparing the outcomes in patients who receive an EUS-RFA vs surgical resection, studies support that those who elect to have EUS-RFA of their insulinomas have significantly fewer adverse effects and shorter hospital stays [5]. Crinò et al highlights the difference between 89 patients who were subjected to surgical intervention vs. EUS-RFA. The clinical efficacy following surgical resection was 100% compared to EUS-RFA's 95.5%; there was a vast difference seen between the adverse events, 61.8% vs. 18.0% [5].

EUS-RFA's is an emerging novel therapy for NET's such as insulinomas. The procedure is performed by an interventional gastroenterologist using EUS. Once the lesion is identified, it can be treated through puncture and RFA application of energy. When surgery is not an option, EUS-RFA remains a viable treatment modality. This novel therapy consists of alternating currents with a frequency of 350-500kHz to the target tissue that is emitted by a special electrode located at the tip of the needle passed through the endoscope with direct visualization of the lesion [6]. The current causes a vibratory movement resulting in a generation of heat which induces local disruption of tumors and localized coagulation necrosis [6]. Jonica et al demonstrate the complete resolution of symptomatic hypoglycemia in a 57-year-old woman with multiple comorbidities following an EUS-RFA treating a 2.2cm insulinoma [7]. Biermann et al highlighted complete visual ablation of a lesion by endosonographic appearance following EUS-RFA in a 90-year-old man who presented with recurrent symptomatic hypoglycemic

episodes [8]. Multiple studies support the decision to pursue EUS-RFA as an alternative mode of treatment of insulinomas like the ones mentioned above, especially in those individuals who have multiple comorbidities and are poor surgical candidates.

In summary, EUS-RFA is a useful therapeutic option for patients who are not surgical candidates or want to pursue a less invasive approach to treating a NET such as an insulinoma. Our video presentation demonstrates successful EUS-RFA of an insulinoma with excellent clinical outcome. We hope to highlight the potential of this novel intervention to improve the treatment of insulinomas.

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