Intraoperative Radiofrequency Ablation of Functioning Insulinoma: A Case Report and Literature Review

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Introduction

Insulinoma is a rare pancreatic islet cell tumor, the most common cause of hypoglycemia related to endogenous hyperinsulinism, occur in 1-4 people per million. Insulinoma account for 60% of islet cell tumors (ICT) and are typically hypervascular, solitary small tumors, 90% of which measure less than 2cm and 30% measuring less than 1 cm in diameter. 38-years-old young man was seen in the outpatient room of Hepato-Pancreato-Biliary department of our institution with the anxiety, dizziness, lightheadedness, personality changes and unusual behavior, which were relieved with eating something or taking glucose water orally. As per patient’s information most episodes were in the evening between 1 to 5 pm, and were associated with prolonged fasting and over exertion. He had many times of unconscious situations in last 10 years. In the every biochemistry findings his serum glucose concentrations had been less than 60mg/dl and he had been given intravenous glucose or taking oral glucose, which resulted in gradual resolution of symptoms. His serum glucose concentration had been 28.8mg/dl when he was seen in our institution. He thus had Whipple triad (symptoms known or likely to be caused by hypoglycemia, low serum glucose at the time of the symptoms, relief of symptoms when the glucose has increased to normal).

Laboratory analysis

The laboratory test results were as follows: hemoglobin: 15.7g/dl, red cell count: 5.56 x1012/l, platelet count: 280x109/l, white cell count: 12.6x109/l. Creatinine: 0.48mg/dl (42mmol/l), urea: 13.4mg/dl (4.8mmol/l), aspartate aminotransferase: 27IU/l, alanine transaminase: 33IU/l, alkaline phosphatase: 116IU/l, partial thromboplastin time 17s. Blood glucose dropped to nornally minimal level of 1.83mmol/l (32.8mg/dl), and the insulin concentration was 10.1mU/m.

Imaging studies

The examinations were performed on a MDCI scanner and on a 1.5 tesla MRI scanner, including T1WI (with slice thickness of 3.0-5.0 mm), T2WI, T2WI trufi, T2WI fat- saturated, T1WI fat saturated with contrast and MRCP. On pre contrast CT scan, singular tumor appeared ill defined, hypodense pattern with no calcification. During the arterial and venous phase of dynamic enhanced CT the tumor depicted solid, homogenous enhancement with well defined lesion about 1.2 cm in pancreatic head with no necrotic hypodense pattern and peripancreatic fat was well preserved. On image shows a 5.0 mm distance between CBD and enhancing lesion. Also on image shows a 4.8-7.5 mm distance between duct of Wirsung and enhancing lesion. There is no defined accessory pancreatic duct on image. There is no involvement of pancreatic duct. Pancreatic duct and CBD are normal in sized. There are no regional nodal involvement and distant metastasis on CT examination. The lesion was hypointense on axial T1WI image and hyperintense on axial T2WI image, T2WI with fat saturated images. After i.v. gadolinium (magnevist, schering, germany) injection, the lesion was hyperintense relative to the surrounding pancreatic tissue during the arterial phase. MRCP showed no displacement and dilatation of CBD and pancreatic duct by the mass.

Midline incision was created with scalp and electrocautery. The Thompson’s retractor was placed. The duodenum and pancreatic head were mobilized elevated located from the retroperitoneum by Kocher maneuver technique. The lesser sac was entered. The head of the pancreas was bimanual palpated and found 1.2 cm sized solid lesion. 18 gauged semi-automatic biopsy-needle in tumor target central placement than take a one of fillar tissue by under ultrasound guided. Intraoperative RFA was performed under direct vision of the duodenum to avoid burn damage. Simultaneously infusion/perfusion with cold normal saline of the areas around the tumors was done during ablation. Ultrasound guided biopsy was performed before RFA. We used the latest Cool-tip VCT (adjustable needle) Radiofrequency system (RF medical generator) with cooled electrode 17 gauge, 15 cm with adjustable 1.5 cm length for rapid tumor destruction. In duration time 1st impedance 4 min and 2nd impedance 3 min with 600C between 800C ablated(Fig.5). The surgery was successfully finished without a perioperative complication. JP drain was placed in a retroperitoneal space to bulb suction. The post-operative course was eventful. Amylase level of peritoneal fluid on the postoperative day 2 was 1.29 U/mL. Peritoneal fluid volume was 50ml/day and amylase level uncountable on POD 9 then drain was removed. We discharged on POD (11) without any complication. Contrast-enhanced CT scans performed, after resurgery, ablation zone and area with no signs of collection and shows complete RFA scar (Fig 9). There was no further hypoglycemic paroxysm in the 6-month postoperative period.

Conclusion

Our study on a small sample of patients demonstrated that RFA of unresectable pancreatic tumors is feasible and safe with minimum morbidity and mortality. The ablated area should not be with in contact of CBD and pancreatic duct to avoid acute pancreatitis, cholangitis or a pancreatic fistula. Intra-operative RFA is safe and feasible in patients with quotient life difficulties in order to avoid surgical approaches.