

Case report

Irreversible electroporation of locally advanced solid pseudopapillary carcinoma of the pancreas: A case report



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ARTICLE INFO

Keywords:

Pancreatic neoplasm
Solid papillary carcinoma
Intraoperative ultrasound
Irreversible electroporation
Case report

ABSTRACT

Introduction: Solid pseudopapillary Carcinoma (SPC) is a rare pancreatic Tumor with variable, usually low, malignancy potential. However, several SPC are associated with aggressive behavior, local vascular infiltration, organ invasion, distant metastasis, and can be unresectable. Irreversible Electroporation (IRE) is an emerging non-thermal ablation technique for the treatment of locally advanced pancreatic carcinoma. We report the results of four year disease-free follow-up in a case of locally advanced unresectable SPC treated with IRE.

Presentation of case: A 24-year female patient with SPC of the pancreas underwent IRE during laparotomy under general anesthesia with intubation. Computed Tomography (CT) showed complete tumor thrombosis of splenic vein, encasement of celiac artery and mesenteric vein. Six insertions of 3–4 electrodes per insertion were performed. One month-CT-control showed shrinkage of the tumor. 6 months-post-treatment imaging showed complete regression of the mass, patent Splenic/mesenteric veins, absence of local recurrence or distant metastasis. Post treatment CTs at 12-18-24-30-36-42-48 months follow-up confirmed absence of local or distant recurrence.

Discussion: Surgery is the first choice curative treatment of SPC. However aggressive surgery (duodeno-pancreasectomy) in unresectable cases, may have a high risk of recurrences, morbidities and death, and bring concerns about endocrine and exocrine insufficiency in a young patient. In these cases, IRE could be a safe and effective alternative treatment and could realize, in selected cases, the condition for a radical surgery, and a bridge to R-0 resection.

Conclusions: IRE could represent an effective alternative therapy to surgery in local advanced, unresectable SPC.

1. Introduction

Solid pseudopapillary Neoplasm (SPN) is a rare pancreatic tumor with variable, usually low, malignancy potential, that represents only 1–2% of pancreatic tumors [1]. Most SPN are discovered incidentally after cross section images exams such as Ultrasound (US), computed tomography (CT) or magnetic resonance (MR) [2]. Usually, SPN is an indolent disease with a good prognosis. Over 90% of patients with a solitary pancreatic lesion are cured by complete excision [3]. However, SPN is not always indolent. Several forms are associated with aggressive behavior [4,5]. Several authors indicate two different types of SPN: the benign type called Solid Papillary Tumor (SPT) and the malignant one defined as Solid Papillary Carcinoma (SPC) of the pancreas [6].

Irreversible electroporation (IRE) is an emerging non-thermal ablation technique that allows tissue ablation without the potential detrimental heat-effects on tissue surrounding the tumor. It delivers short electrical pulses through probes inserted into the tissue in order to modify the cell membrane permeability that results in cells' death [7]. IRE showed high efficacy in the treatment of locally advanced pancreatic carcinoma and also in other neoplasms of the pancreas [8,9]. One of the major advantages of this technique is that it can be used in tumors that are in close proximity to peri-pancreatic structures without risk of vascular trauma or biliary damage [7].

We report the case of a young patient affected from an aggressive large SPC of the pancreas with locally invasive behavior, successfully treated with IRE, with a long term disease-free-survival follow-up.

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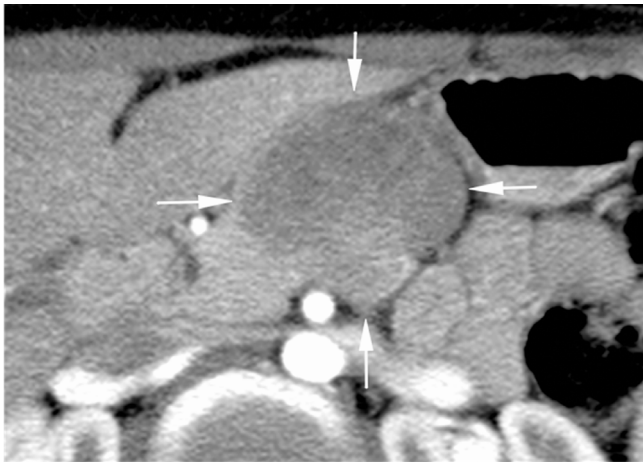


Fig. 1. CT scan shows a large solid mass of pancreatic body and tail (arrows) that displaces nearby vascular structures.

The work has been reported in line with the SCARE criteria [10].

2. Case report

24 years young Female was admitted at our Division of Surgery – A. Tortora Cancer Hospital, in the late august 2013, because of a solid upper abdominal mass detected at a US examination performed the day before. In the last 2 months she complained epigastric pain, nausea, lack of appetite and weight loss. At admission she showed a tender abdomen, absence of peritonism, no clear palpable mass, a slight tenderness at deep palpation of the epigastrium. She showed normal breathing, normal blood pressure (120/70 mmHg) and heart rate (80/min), normal diuresis and feces without sign of rectorraggia. Blood tests showed slight anemia (Hgb = 10.8%) and increased amylase level (256 U/L). All the other routine blood tests were within normal ranges. There was mild increase of Carbohydrate Antigen 19-9; (65 U/ml) while all the other tumor markers were normal. Abdominal US, total body enhanced CT and MR showed a solid mass (diameters = 65 × 55 × 50 mm) involving the pancreatic body and isthmus (Fig. 1), complete tumor thrombosis of the middle and distal portions of splenic vein (Fig. 2), encasement of celiac artery (Fig. 3), and infiltration of the mesenteric vein wall. Imaging did not show any distant metastasis to lymphnodes, liver, lung or other sites. The patient underwent Percutaneous US guided biopsy that showed pancreatic



Fig. 3. CT scan shows encasement of celiac artery (arrow).

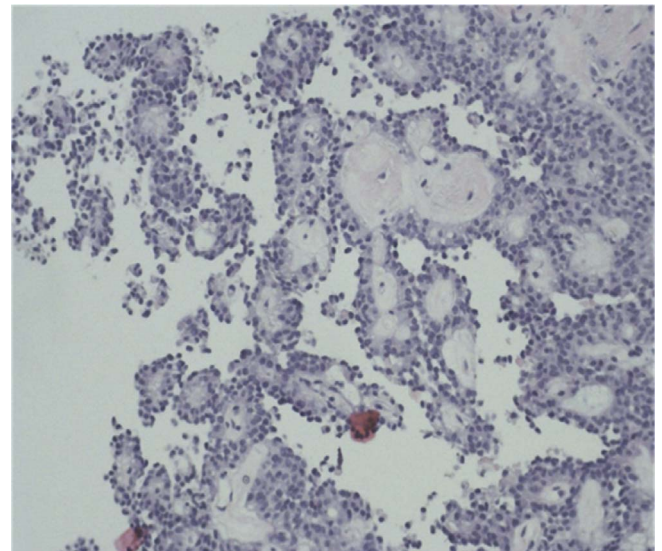


Fig. 4. US guided biopsy shows: pancreatic “Solid Papillary Adenocarcinoma”.

“Solid Papillary Adenocarcinoma”(Fig. 4).

The oncology-Surgical team judged the tumor unresectable or possibly resectable with vascular resection and reconstruction. The partial resection was also considered an acceptable aim, so that the patient was advised for surgery. However, after informed consent, with discussion of the high risks of surgical intervention, consequences of major resection and possible incomplete excision of the tumor, the patient refused surgical therapy. As alternative and less invasive treatment, ablation of the tumor by IRE was offered. The patient accepted this second choice and informed consent to undergo IRE treatment was obtained.

PROCEDURE: The patient underwent laparotomy under general anesthesia with intubation. In order to avoid strong muscle contractions induced by electric pulses, the myorelaxant cisatracurium besylate (Nimbex[®], GlaxoSmithKline, Brentford, United Kingdoms) was used. After laparotomy the gastro-colic omentum was opened to reach and expose the pancreatic tumor. In order to schedule the next steps, an accurate intraoperative Color doppler US examination was performed with a commercially available equipment (EPIC 7 - Philips Healthcare-United States), high frequency (7–15 MHz) intraoperative probe (L15-



Fig. 2. CT scan shows complete tumor thrombosis of splenic vein (arrows).

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