The Efficacy of RFA for an Advanced Pancreatic Cystadenocarcinoma.  
A Case Report

Panayiotis Hadjicostas and Demetris Christou*

Department of General Surgery, Division of surgical oncology, Hippocrateon Private Hospital, Nicosia, Cyprus

*Corresponding Author: Demetris Christou, Department of General Surgery, Division of surgical oncology, Hippocrateon Private Hospital, Nicosia, Cyprus.

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Abstract

Background: Cystic tumours of the pancreas, even though rare can present a challenge to the surgeon if they present late with infiltration of nearby organs and tissues. Radiofrequency ablation (RFA), can be used safely with palliation intent in these tumours as described by our case report.

Methods: RFA for inoperable cystic tumours of the pancreas as far as we know is not described in the literature. This case report aims to present a case of an inoperable advanced huge pancreatic cystadenocarcinoma with duodenal infiltration causing significant upper gastrointestinal bleed, treated palliative with RFA and give our recommendations on the technique that could be employed.

Results: RFA was used without any immediate complications. The postoperative period was uneventful. The CT scans that followed showed remarkable changes in the size and echogenicity of the tumour, achieving stagnation of its size and stopped the gastrointestinal bleed which was our major intent.

Conclusions: RFA can play an important safe and cost effective palliative management of inoperable pancreatic cystadenocarcinomas, which may control symptoms, prolong survival and improve the quality of life.

Keywords: RFA; Pancreatic Cystadenocarcinoma

Introduction

Pancreatic cancer still represents one of the most lethal cancers [1,2] principally due to the late diagnosis secondary to symptomless initial stages, making operation impossible on most occasions. Its aggressiveness and infiltration to neighbouring major organs and vessels present a challenge to the surgeon and only a minority of patients (20%) are candidates and benefit from a radical resection [3]. Pancreatic cystic adenocarcinomas are even rarer tumours, with even fewer referrals in the literature on their appropriate management.

The presenting symptoms of pancreatic cancer are well known and vary depending on the site of the tumour. On rare occasions the tumour may erode through the adjacent duodenum causing significant bleed. Palliation in these patients is the only solution. Several palliative techniques have been employed in an attempt to control mainly the symptoms, but also to control the growth of the tumour prolonging the asymptomatic survival of the patient. These include palliative Radiofrequency ablation (RFA), chemo-radiation, intraoperative beam irradiation/intra-operative radiation therapy (IORT), interstitial or intraluminal brachytherapy [4-11].

RFA as a ‘debulking’ agent for solid pancreatic ductal adenocarcinomas has been described previously by our team, suggesting promising results as palliative means in advance tumours [11].

RFA for inoperable cystic tumours of the pancreas as far as we know is not described in the literature. This case report aims to present a case of an inoperable advanced huge pancreatic cystadenocarcinoma treated palliatively with RFA and give our recommendations on the technique that could be employed.

Case Report

This article aims to present our experience with the use of RFA for the palliative management of a patient diagnosed with advanced pancreatic cystadenocarcinoma.

We present a case of a 70 year old male Caucasian who presented initially to the physicians with upper gastrointestinal (UGI) bleed and melaena. Gastroscopy revealed a large bleeding tumour infiltrating the duodenum which was biopsied. The tumour was also biopsied percutaneously with CT guidance. The biopsies from the tumour concluded pancreatic cystadenocarcinoma. The patient did not have jaundice. The initial CT showed an enormous (15 cm) pancreatic tumour of the head and body of the pancreas which infiltrated the duodenum (Figure 1).
The patient was informed of the inability for surgical resection and offered the option of palliative surgery and intraoperative RFA, which he accepted. The intention was to ablate and burn the tumour and stop the bleeding. He underwent an explorative laparotomy, Kocherisation of the duodenum was done with care and the RFA was performed under direct vision, either directly onto the tumour or transduodenally (Figure 2).
We used the Radionics system Cooltip RF Ablation system, employing the cluster needle as well, for rapid tumour destruction (Figure 3).
Simultaneous infusion with cold normal saline as per protocol was done during ablation in order to avoid burn damage. The RFA was performed for a duration of 2 - 5 minutes on each site and using the overlapping technique in 4 different sites of the tumour, at 60 - 70 degrees Celsius.

Because the tumour was ultimately going to obstruct the duodenum and the common bile duct, it was decided to complete the operation by palliative bypass Roux-en-Y gastrojejunostomy and cholecystojejunoanostomy and Braun-type side-to-side enterointerotomy. A drainage tube was placed in the ablated area and the postoperative serum and peritoneal fluid amylase was measured for 5 days as per departmental protocol. The patient was also administered subcutaneous octreotide (Sandostatin) for 5 postoperative days.

**Results**

The postoperative period was smooth and uneventful. It was not complicated with pancreatitis or hyperamylasaemia and the GI bleed stopped. The patient was discharged home the 8th postoperative day. The tumour was investigated with a repeat CT scan one month later. The scan showed remarkable changes in the morphology and echogenicity of the tumour (Figure 4).

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The follow up of the patient with CT scan is done yearly and shows stagnation of the size and morphology of the tumour. Also the patient has no further admissions with UGI bleed. The intention to stop bleeding and regress the growth rate of the tumour were fully achieved. The RFA technique was proven time and cost efficient with no procedural or postoperative difficulties. With this technique we also achieved prolongation of survival and the patient is still alive 30 months after the operation.

Discussion

Approximately 15% of pancreatic tumours are not pancreatic ductal adenocarcmomas (PDAC), present a pathologically heterogeneous group and usually they have better prognosis. Mucinous and serous pancreatic cystadenocarcinomas, intraductal papillary mucinous neoplasm (IPMNs), pancreatic neuroendocrine tumours (pNETs), pancreatic lymphomas, acinar cell tumours and metastatic pancreatic tumour are included in this group of cancers.

The malignant proportion of these tumours have prognostic 5-year survival rates of 40 - 80% depending on the type of tumour:

Pancreatic cystadenocarcinomas (usually mucinous and rarer serous) represent < 1% of all pancreatic neoplasms, but the commonest of all the cystic pancreatic neoplasms (50%). Their presentation is usually atypical and are found, on many occasions incidentally, as a single tumour at the body or the tail of the pancreas, however presentation at the head is also possible.

The management of malignant cystic tumours of the pancreas is complete resection whenever possible. However, since their diagnosis is usually done late, most of them are deemed inoperable and the patient requires a palliative surgical approach.

Since oncologists cannot handle these patients, the surgeons may offer palliative solutions with RFA. RFA has been used extensively as an ablative technique for the control of tumour growth and management of symptoms for several solid tumours all over the body in the past [10]. We described how it can be used with excellent results on a series of now 20 patients [11] with locally advanced pancreatic ductal adenocarcinoma. We are not aware if there is any case in the literature, however, where RFA was used for cystadenocarcinomas.

RFA is a technique which uses local thermal energy to ablate and destroy the tumour with the intention to eliminate it, control its growth and control it local infiltrative destructive results. RFA causes destruction of the tumour at cellular level causing coagulative necrosis and protein denaturation, acting as a ‘salvage’ local cytoreductive therapy [11]. RFA of pancreas is used accordingly on selected patients and personalised for each patient individually.

Even though RFA can be performed percutaneously or even endoscopically, for our case we chose to perform it during laparotomy, since we knew that the patient would need palliative bypass procedures as well. We used the cluster electrode due to the big size of the tumour. We propose a similar technique protocol that we used with the ductal adenocarcinoma series [11] that is with the use of Cooltip RF Ablation (Radionics) system, 17-gauze, 15 cm with 3 cm length electrode or cluster electrode for rapid tumour destruction and simultaneous infusion/perfusion with cold normal saline of the surrounding tissues during ablation in order to avoid damage. The duration of the ablation should be 3 - 5 minutes in 3 - 4 different sites in the tumour (depending on the size) at a temperature of 60 - 70 degrees Celsius. We also suggest intra-operative ultrasound scan (IOUS) during the procedure in order to avoid ablating near the portomesenteric vessels and the duodenum.

Since RFA in this case had a palliative intention, and we knew that the duodenum and the common bile duct was in close proximity of obstruction, we completed the operation performing palliative biliary cholecystojejunostomy and enteric gastrojejunostomy bypass procedures as described previously, something that we consider obligatory in order to avoid secondary operations.

The endogenous anti-neoplastic effect on the immune system of RFA, as well as the direct effect of RFA on the neoplastic cells has been described extensively in the literature [12-22]. The use of RFA for inoperable solid adenocarcinomas of the pancreas has been described
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in the literature. However, as far as we know there is no mention in the literature regarding an inoperable complicated huge pancreatic cystadenocarcinoma managed with RFA. Therefore, taking into consideration the outcome of our case, we suggest the feasibility and safety of the use of RFA in situations where no other option is available.

Conclusion

Even though rare, pancreatic cystadenocarcinomas can go unseen until they give symptoms. When finally are recognised their resection is deemed impossible. In these scenarios, surgeons may incorporate the use of RFA with confidence as part of a multimodal treatment palliative approach. RFA can play an important safe and cost effective palliative management of inoperable pancreatic cystadenocarcinomas, which may control symptoms, prolong survival and improve the quality of life.

Bibliography


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