

Successful gamma knife radiosurgery combined with S-1 in an elderly man with local recurrent pancreatic cancer

A case report

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Abstract

Rationale: Pancreatic cancer is common in people older than 40 years, and the incidence peaks at the age of 70 years and older. Chemoradiotherapy has been generally considered a high-risk procedure in elderly patients with local recurrent pancreatic cancer. Gamma knife stereotactic radiosurgery has the advantage in protecting the surrounding tissues, and providing short-term effects. It has been successfully used in patients with brain metastases. The efficacy of GKSRS in other malignancies has barely been studied. S-1 is one of the key drug against metastatic and local advanced pancreatic cancer. The combination of GKSRS and S-1 in local recurrent pancreatic cancer has hardly been reported.

Patient concerns: We present a rare case of a 76-year-old man with pancreatic cancer. He complained of recurrent abdominal pain and chronic pain in the right shoulder for more than 3 years.

Diagnoses: After several examinations, the diagnosis was carcinoma of the pancreas.

Interventions: A resection of the pancreatic neoplasm was performed on June 21, 2011; he did not receive adjuvant chemotherapy. In April 2014, postoperative recurrence was confirmed in the head of the pancreas. The patient received gamma knife stereotactic radiosurgery (GKSRS) combined with S-1 treatment.

Outcomes: The patient showed complete response after 2 months. He has achieved an overall survival of 76 months with a very good performance status.

Lessons: GKSRS applied to other malignancies has rarely been reported. S-1 is the key drug for adjuvant chemotherapy in resected pancreatic cancer. There are a few studies on this combination in local recurrent pancreatic cancer. GKSRS combined with S-1 seems to be a good option in improving efficacy and prolonging life in elderly patients with locally recurrent pancreatic cancer.

Abbreviations: 5-FU = 5-fluorouracil, CA19-9 = carbohydrate antigen 19-9, CR = complete response, CT = computed tomography, GKRS = gamma knife stereotactic radiosurgery.

Keywords: elderly man, gamma knife stereotactic radiosurgery, recurrent pancreatic cancer

1. Introduction

Pancreatic carcinoma is one of the most common malignancies of the digestive system. It most frequently appears in elderly patients, with most patients being diagnosed in the range of 70 to 79 years.^[1,2] The majority of patients with pancreatic cancer initially present with locally advanced and metastatic disease, and a fewer than 20% have resectable tumors.^[3] The curative effect and reliability of gamma knife stereotactic radiosurgery (GKSRS)

have been confirmed in the treatment of brain metastases,^[4] but its efficacy in other malignancies has barely been reported. The efficacy and safety of S-1 monotherapy against metastatic pancreatic cancer have been established in clinical practice.^[5] The combination of GKSRS and S-1 in local recurrent pancreatic cancer has hardly been studied. We present a rare case of a 79-year-old man with recurrent pancreatic cancer who was treated with GKSRS combined with S-1 regimen and showed a good response. The patient has achieved long-term survival of 76 months because of multidisciplinary treatment.

2. Case report

A 76-year-old man was admitted to the hospital in June 2011. He complained of recurrent abdominal pain, accompanied by chronic pain in the right shoulder for more than 3 years. His past medical history was unremarkable. Physical examination did not indicate any abnormalities. An abdominal computed tomography (CT) scan revealed the presence of a hypovascular mass from the neck to the tail of the pancreas with direct invasion of the splenic artery. Resection of the pancreatic neoplasm was performed on June 21 2011. The pathological diagnosis was invasive ductal adenocarcinoma. The postoperative course was uneventful and he did not receive adjuvant chemotherapy. He was in good condition and there was no recurrence detected by

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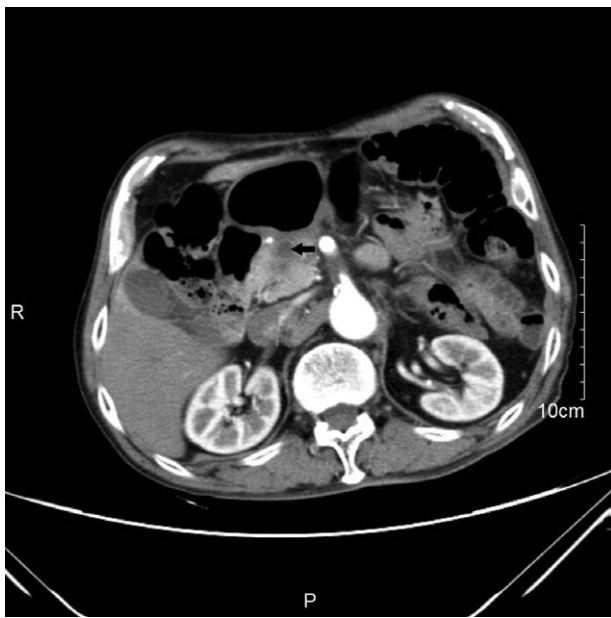


Figure 1. Contrast-enhanced computed tomography (CT) scanning showed an invasive hypovascular mass (black arrow) 10 × 8-mm in diameter in the pancreatic head.



Figure 2. Postchemoradiotherapy CT showed complete disappearance of the lesion.

follow-up periodic imaging or serum tumor markers. The serum tumor marker carbohydrate antigen 19–9 (CA19–9) levels were elevated to 132.3 U/mL (normal limit: 37 U/mL) in April 2014, and contrast-enhanced CT showed a 10 × 8-mm low-attenuating tumor in the head of the pancreas (Fig. 1). Further, positron-emission tomography-CT revealed an abnormal accumulation at the site. Thus, postoperative recurrence was confirmed. A 1-month course of chemotherapy was performed with single-agent S-1 regimen received orally twice a day at a dose calculated according to the body surface area (< 1.25 m², 40 mg/d; ≥ 1.25 to < 1.5 m², 50 mg/d; ≥ 1.5 m², 60 mg/d). He received 120 mg/day on days 1 through 14 of a 21-day cycle. Concurrent GKSRS to the recurrent pancreatic lesion was performed for local control. It was delivered at 5 Gy per fraction every other day, with a total dose of 30 Gy. He received one cycle of chemotherapy with S-1 in March 2014. He felt fatigue and S-1 treatment was discontinued. His CA19–9 serum concentration decreased to 43.4 U/mL in June 2014. Follow-up CT 2 months later showed the lesion had completely disappeared (Fig. 2). The patient showed a complete response (CR) according to the Response Evaluation Criteria in Solid Tumors (RECIST 1.1). He has been disease-free in subsequent follow up with CT since that time and has achieved an overall survival of 76 months with a very good performance status (Karnofsky 90%).

2.1. Ethics approval and consent to participate

This study was approved by the Ethics Committee of Dongyang People's Hospital. Written informed consent was obtained from the patient for publication of this clinical case.

3. Discussion

Early diagnosis of pancreatic cancer is difficult and the prognosis is very poor, with a median survival of only 4 to 6 months and a 5-year survival rate of approximately 5%. The incidence of

pancreatic cancer continues to rise. It is estimated that pancreatic cancer will be the second leading cause of cancer-related death in 2030.^[6] Pancreatic cancer is common in people older than 40 years, and the incidence peaks at the age of 70 years and older.^[1] The choice of treatment for patients at this age should consider performance status, comorbidity and tolerance to therapy. At present, there is still a lack of clinical guidelines for advanced pancreatic cancer for elderly patients. Some studies indicate that for resectable pancreatic carcinoma, pancreatic resection can be conducted for the elderly with acceptable mortality rates and long-term survival.^[7–10] Most patients can only tolerate monotherapy caused by a variety of medical conditions. Combined chemotherapy with multiple drugs easily leads to serious complications such as severe liver and kidney function damage, bone marrow suppression, important viscera function failure, refractory infection, bleeding, and even death.

S-1 is a newly developed oral 5-fluorouracil (5-FU) prodrug with demonstrated activity against several cancer types, which consists of tegafur/gimeracil/oteracil in a molar ratio of 1.0:0.4:1.0.^[11] S-1 is the key drug in adjuvant chemotherapy for resected pancreatic cancer. Gemcitabine monotherapy is the standard adjuvant chemotherapy for advanced pancreatic cancer. S-1 seems to be more effective compared with gemcitabine as the adjuvant chemotherapy in metastatic pancreatic cancer patients.^[12] S-1, an oral fluoropyrimidine derivative, is convenient to take and well tolerated. Therefore, it is easily accepted by elderly outpatients. First-line treatment with S-1 may be a reasonable therapeutic option for elderly patients with pancreatic cancer.^[13]

The emergence of GKSRS increases the radiation tumor dose and decreases the normal radiation tissue dose. It also plays a role in protecting the surrounding tissues, relieving symptoms and providing short-term effects, and is well tolerated. GKSRS has been successfully used in the salvage setting for brain metastases in patients for whom whole brain irradiation has failed.^[14] However, the efficacy of GKSRS in other malignancies has barely

been studied. This is especially true of patients with pancreatic cancer who have lower body function. It can be regarded as an effective treatment method for elderly patients with inoperable local recurrence of pancreatic cancer.

In this case, S-1 regimen was our best option because our patient could not tolerate aggressive chemotherapy. We chose to add concurrent GKSRS over a short treatment period for local control, which was well tolerated. He had achieved CR after 2 months. 5-FU-based chemoradiotherapy for selected elderly patients with locally advanced pancreatic carcinoma leads to a better survival compared with younger patients.^[15] With careful patient selection, GKSRS combined with S-1 can be an appropriate treatment option for elderly patients with local recurrent pancreatic cancer.

4. Conclusion

We reported the rare case of an elderly man with recurrent pancreatic cancer who was treated with GKSRS combined with S-1, which had excellent treatment effect. He is now 82 years old, and has a very good performance status approximately 76 months after the initiation of treatment.

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