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Clinical Images

Combined treatment for solid pseudopapillary tumor of the pancreas with liver metastasis

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Solid pseudopapillary tumor (SPT) of the pancreas is a rare pancreatic disease. Generally, it is considered a benign or low-grade malignant tumor. SPT of the pancreas with liver metastasis or invasion to adjacent organs is usually uncommon. We report a female patient who was diagnosed with SPT of the pancreas with liver metastasis. The patient received a series of treatments, including distal splenopancreatectomy, liver metastasis tumor resection, trans-arterial embolization (TAE) and high intensity focused ultrasound (HIFU) over the past 10 years.

A 51-year-old female patient complained of abdominal pain about 10 years ago. CT scan revealed a mass lesion in the pancreatic body and tail. Tumor markers and other blood test results were negative. This patient was diagnosed with pancreatic tumor, and the resection of pancreatic body and tail and total spleen (distal splenopancreatectomy) was then performed. Postoperative pathological diagnosis was confirmed to be SPT of the pancreas (Gruber-Frantz tumor). The patient recovered well after operation. Unfortunately we could not retrieve the first CT images and tissue histology.

About 4 years ago, the patient noticed a fist-like mass at the right upper quadrant, but without any discomfort. Two years later, she felt pain on the right upper quadrant and visited our hospital. On admission, contrast-enhanced CT scan showed multiple occupying lesions in segment II, III, VI and VII of the liver. On August 11, 2016, the patient underwent partial hepatectomy with left lobe, segment VI and VII. All the visible tumor lesions were resected (Fig. 1). Postoperative pathological diagnosis was low-grade liver cancer and tumor margins were negative. Combined pancreatic tumor history and immunohistochemical staining confirmed the recurrence of SPT of the pancreas, with liver metastasis.

Unfortunately, 14 months after the second operation, follow-up CT scan revealed a new lesion at segment VIII of the liver. Liver function and tumor markers were normal. This patient did not accept laparotomy. She underwent TAE and HIFU ablation. After TAE and HIFU treatment, an enhanced MRI revealed necrosis of liver metastasis (Fig. 2). The patient was in good condition. No new recurrence in the liver or other organs was found during her follow-up. The patient survived for 10 years and 2 months until this report was written.

SPT of the pancreas is considered a low-grade malignancy, which is usually located in the tail and body of the pancreas, and metastasis to the liver or other organs may occur. SPT of the pancreas is more common in women than in men and children, accounting for less than 3% of pancreatic tumors [1–5]. Abdominal mass and abdominal pain are the most common and initial symptoms, and some patients may have no symptoms. Imaging examinations such as CT or MRI are helpful in the diagnosis of SPT of the pancreas, but the definitive diagnosis depends on preoperative biopsy, intraoperative frozen section, and postoperative pathology [6]. Surgery is the preferred treatment for SPT of the pancreas. It is reported that more than 95% of SPT of the pancreas patients can be cured surgically [7].

It is worth mentioning that HIFU combined with TAE are the recommended therapeutic options for solid tumors with abundant blood supply [8,9]. HIFU is a new non-invasive treatment, which focuses on the tumor tissue and makes high temperature, causing coagulative necrosis of tumor cells. It can be used for local ablation of pancreatic cancer and other solid tumors including liver cancer and fibroids [9]. The CT scans indicated that the patient had a rich blood supply to the recurrent lesion in segment VIII of the liver. Therefore, it was appropriate to block the blood supply of the tumor with TAE before HIFU treatment. After decreasing the tumor blood supply, the heat of HIFU treatment was more effective [10].

Bostancı et al. [1] reported surgical outcomes of 16 cases of SPT of the pancreas, and the survival time ranged from 6 to 99 months. Bhutani et al. [2] reported 11 cases of SPT of the pancreas. After surgery, 3 cases were considered malignant. One patient with multiple liver and omentum metastases died at the ninth month postoperatively. Another female patient also developed multiple liver and omentum metastases at the 20th month postoperatively, who died at the 24th month postoperatively. Comparatively, our patient has a longer survival time.

In conclusion, combined surgical resection with TAE and HIFU methods maximized the survival of patient with SPT of the pancreas and metastasis.

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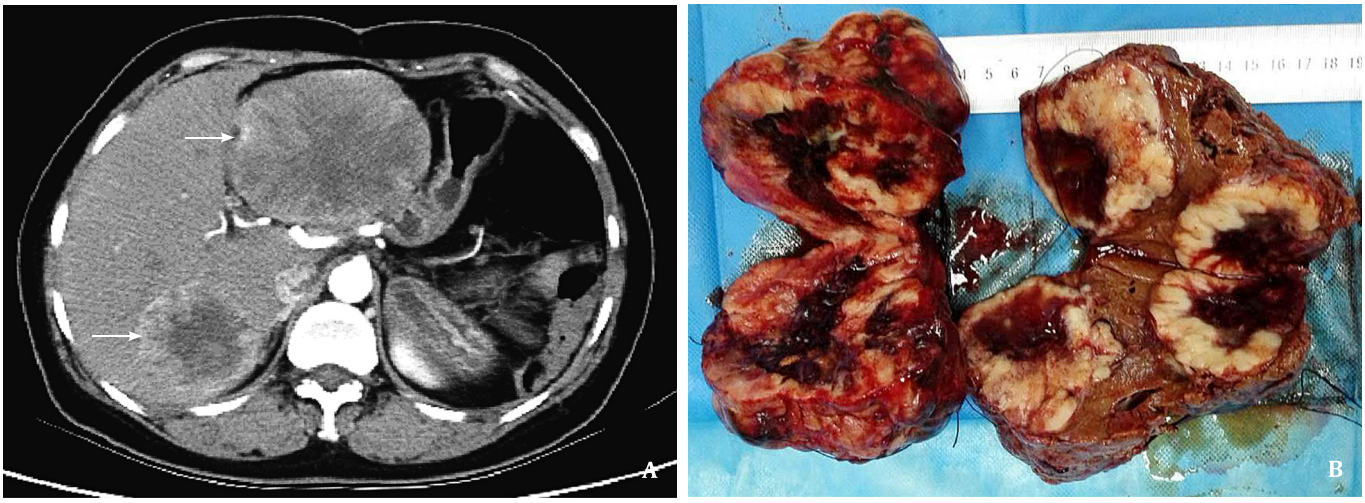

Fig. 1. **A:** Contrast-enhanced CT showed multiple occupying lesions (arrows) in the liver; **B:** Postoperative microscopical tumor specimens.

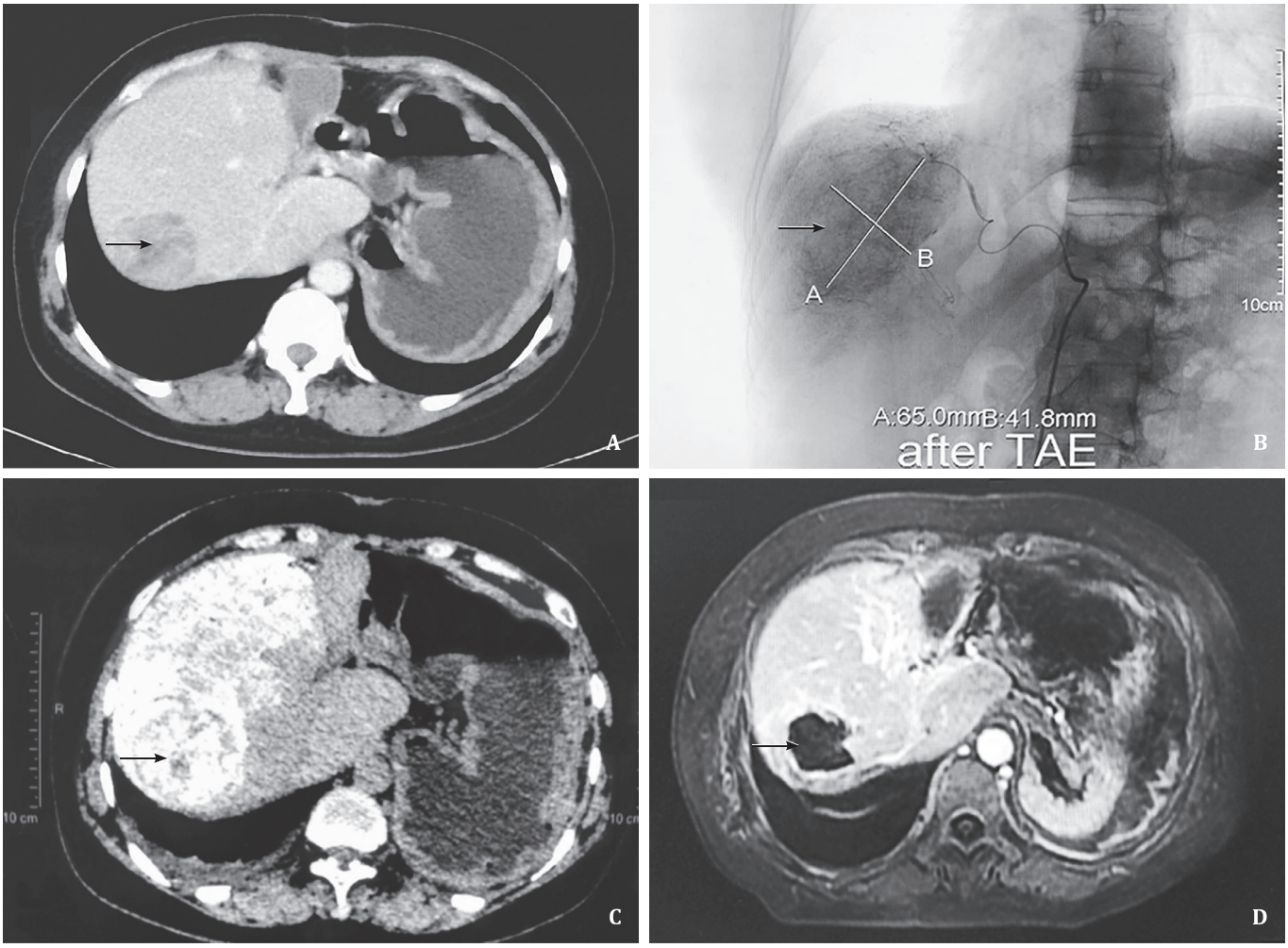

Fig. 2. **A:** CT scan showed a tumor mass (arrow) located on the segment VIII of the liver; **B-C:** after TAE, lipiodol deposited in the liver tumors (arrows); **D:** after TAE and HIFU, enhanced MRI revealed the necrosis of liver metastasis (arrow).

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Contributors

CH proposed the study. STL performed the research and wrote the first draft. WFR collected and analyzed the pathology data. All authors contributed to the design and interpretation of the study and to further drafts. LYM is the guarantor.

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Ethical approval

The patient was informed of the treatment and signed the informed consent for treatment. The consent for publication was obtained from the reported patient.

Competing interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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