Oncology and Translational Medicine
DOI 10.1007/s10330-018-0300-0

October 2018, Vol. 4, No. 5, P219–P221

CASE REPORT

Treatment of aggressive pancreatic solid pseudo-papillary neoplasms with apatinib plus S-1 chemotherapy: A case report and literature review

Yang Tang[1], Li Yang[2], Xianglin Yuan[1] (✉)

[1] Department of Oncology, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, China
[2] Department of Hematology, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, China

Abstract

Solid pseudopapillary neoplasm (SPN) is a rare indolent pancreatic neoplasm that occurs mostly in females. Although the malignancy potential is quite limited for SPN, these tumors can sometimes be aggressive and lead to inferior prognosis for male patients. In this case report, we present a special case of a male patient with SPN who experienced an aggressive tumor expansion after two surgical resections. For further treatment, we decided to administer chemotherapy with apatinib and S-1, and subsequent CT/MRI tumor monitoring indicated satisfactory control of tumor expansion. The effectiveness of apatinib plus the S-1 regimen should be tested for more patients with SPN in the future.

Received: 30 May 2018
Revised: 16 July 2018
Accepted: 9 October 2018

Key words: solid pseudopapillary neoplasm; apatinib; S1; chemotherapy

Solid pseudopapillary neoplasm (SPN) is a rare indolent pancreatic neoplasm that mainly occurs in female patients. It was first described by Frantz as a distinct disease in 1959. Generally, surgical resection is the first choice for SPN treatment, and post-surgical prognosis is excellent. However, reports have shown that in some male patients, SPN presents aggressive behavior and leads to inferior prognoses. In this case, we present a male patient with SPN who experienced local progressive disease after two surgical treatments. Then, apatinib plus S-1 chemotherapy was administered, which achieved satisfactory tumor control. This is the first report of a patient with aggressive SPN who was treated with apatinib plus S-1 chemotherapy.

Case report

The patient was a 54-year-old male who incidentally found a solid mass located in the epigastric region during a routine health examination. He received his first surgery on November 24th, 2013. The surgical inspection showed that the solid mass was 15 cm in diameter and surrounded the tail of pancreas, pushing spleen posteriorly and the left colic flexure downward. No signs of spleen vasculature were seen. However, the tumor had severe adhesion with the retroperitoneum (Fig. 1a). Subsequent pathological inspections confirmed the diagnosis of solid pseudo papillary neoplasm (Fig. 2a). Histochemistry profiling demonstrated that the tumor possessed CD56+, CD10+, beta-catenin nuclear/ plasma+, PR +, Syn + partial, CgA–, PCK–, CK8/18–, EMA–, Ki-67LI 3% (Fig. 2b). The patient was discharged after surgery. In February 2017, the patient revisited our hospital after three days of abdominal pain. His MR scanning report showed multiple solid masses in his peritoneal cavity and retroperitoneum. Multiple circular long T2 signals were identified on the right lobe of his liver (Fig. 1b). For further treatment, the patient received secondary surgical resection of the pancreas body, spleen, omentum majus, left half transverse colon, left colic flexure, part of escend colon, and tumor mass.

✉ Correspondence to: Xianglin Yuan. Email: xlyuan1020@163.com

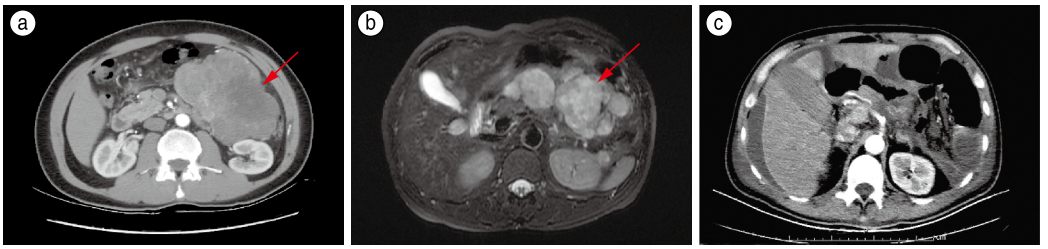

Fig. 1 (a) Pancreatic tumor CT scan image before first surgery in 2013; (b) MRI image of recurrent pancreatic SPN before second surgery in 2017; (c) CT scan image for disease re-evaluation after second surgery in April 2017

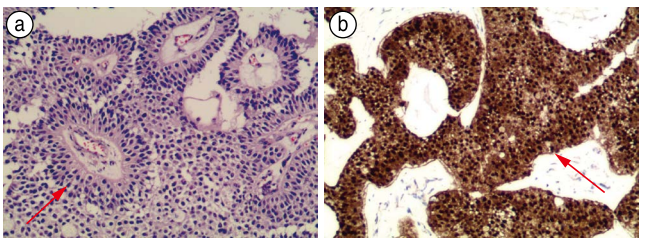

Fig. 2 (a) Histologic study of tumor tissue demonstrated typical SPN pathological pattern; (b) Pathological histochemistry profiling of tumor

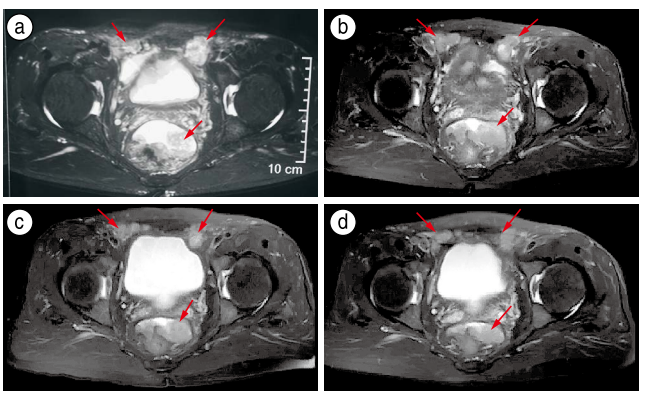

Fig. 3 (a) Pelvic MRI image of metastatic SPN before apatinib + getafur treatment in July 2017; (b) Pelvic MRI image of metastatic SPN after 1 month of apatinib + getafur regimen in December 2017; (c) Pelvic MRI image of metastatic SPN after 3 month of apatinib + getafur regimen in February 2018; (d)Pelvic MRI image of metastatic SPN after 5 month of apatinib + getafur regimen in April 2018

The surgical inspection indicated that the tumor was mainly located in the body of pancreas, closely attached to posterior wall of the stomach. The tumor was also found at the antrum of the spleen, sulcus of sigmoid colon, proximity of gall bladder, surface of right renal fascia, and omentum majus. The subsequent pathological diagnosis confirmed that the tumor was also a solid pseudo papillary neoplasm. Histochemistry indicated that the mass was PCK–, VIM+, CD10+, CYCLIN D1+, PR+, SYN+, BETA CATENIN+, KI67 5%–10%. After surgery, the disease was reevaluated by CT scan in April 2017, and no evidence of disease progression was found (Fig. 1c). Four months later, another CT/MR scan detected a tumor at the bladder rectal space, right groin, and rectus abdominus (Fig. 3a). Considering the local progressive disease status, the patient was given two cycles of apatinib plus S-1 chemotherapy on November 5th, 2017. The MR scan on December 15th, 2017 showed significant reduction of the tumor in the proximity of the bladder rectal space (Fig. 3b). The patient's status was considered PR afterwards, and the patient continued receiving six cycles of chemotherapy. A serial MR scanning re-evaluation was performed every two months during the third-sixth cycles of chemotherapy (February and April 2018), and the reports demonstrated continuous size reduction of the metastatic tumor (Fig. 3c and Fig. 3d). The tumor was well controlled; and throughout chemotherapy, there was no significant adverse effects. The patient is currently under his seventh and eights cycles of apatinib plus S-1 chemotherapy.

Discussion

Solid pseudo-papillary neoplasm (SPN) is a rare pancreatic tumor that accounts for only 1%–2% of pancreatic neoplasms[1]. Generally, clinical reports worldwide indicate that SPN is an indolent tumor with limited malignant potential. However, several aggressive SPN cases have been reported to present local recurrence and metastasis [2]. Current investigations on SPN pathogenesis have shown obscure findings, since SPN tends to occur in female patients (> 85% of total cases) [3], researchers have speculated that SPN could originate from genital ridges during organogenesis [4]. SPNs are usually large, soft solitary ovoid tumors that are well circumscribed by surround tissues [5]. Histologically, SPNs commonly consist of solid sheets of neoplastic cells that surround blood vessels and presents a pseudo-papillary appearance [5]. Through microscopic inspection, SPN cells always extend into the surrounding normal pancreatic parenchyma and sometimes exhibit calcification formation. However, vascular and perineural invasion are quite rare. Histochemical staining of SPN often show

positivity for vimentin, CD10, neuron-specific enolase, progesterone receptors, CD56, alpha-1-antitrypsin, and alpha-1-antichymotrypsin, with the latter two stains showing patchy but intense positivity in areas of hyaline globules. A CT/MR scan is the main imaging diagnostic tool for patients with SPN. SPNs are typically hypo-attenuated on unenhanced images and remain hypo-attenuated during pancreatic and portal venous phases. Calcification is commonly seen in the tumor periphery. Compared with CT, MR scanning is quite suitable for identifying intra-tumor hemorrhages, which are a feature of SPN. For SPN treatment, surgical resection is the standard treatment for SPT and is usually associated with good prognosis, while a small portion of SPNs with aggressive behavior are associated with inferior prognosis. For this aggressive type of SPN, no suitable chemotherapeutic strategies have been proposed.

Apatinib, which is also known as AiTan or Rivoceranib, is a novel selective small molecule VEGFR-2 tyrosine kinase inhibitor [6]. It is the second anti-angiogenic drug to be approved in China for the treatment of advanced metastatic gastric cancer [7]. Several in vivo experiments have indicated that apatinib in combination of traditional chemotherapeutic drugs showed dose-dependent tumor inhibitive effects in several xenograft models [6]. Current randomized, double-blinded, multicenter, phase 2 and phase 3 trials of Chinese patients with advanced or metastatic gastric cancer or GEA demonstrated that oral apatinib significantly prolonged median PFS and OS and had a manageable safety profile [8]. However, up till now, there have been no reports of the application of apatinib to pancreatic tumors.

In this case, the patient received eight cycles of apatinib+S-1 chemotherapy and achieved satisfactory tumor control, as determined by a CT/MR reevaluation one year after the second surgical treatment. The regimen was effective for this aggressive type of SPN, was conveniently orally administered, with acceptable chemotherapeutic adverse effects, and offered a high quality of life for the patient with a tumor. Apatinib plus S-1 should be validated in large scale clinical trials to determine whether this therapy should be recommended for SPN treatment.

References

1. Papavramidis T, Papavramidis S. Solid pseudopapillary tumors of the pancreas: review of 718 patients reported in English literature. J Am Coll Surg, 2005, 200: 965–972.
2. Machado MCC, Machado MAC, Bacchella T, *et al*. Solid pseudopapillary neoplasm of the pancreas: distinct patterns of onset, diagnosis, and prognosis for male versus female patients. Surgery, 2008, 143: 29–34.
3. Mao C, Guvendi M, Domenico DR, *et al*. Papillary cystic and solid tumors of the pancreas: a pancreatic embryonic tumor? Studies of three cases and cumulative review of the world's literature. Surgery, 1995, 118: 821–828.
4. Kosmahl M, Seada LS, Janig U, *et al*. Solid-pseudopapillary tumor of the pancreas: its origin revisited. Virchows Arch, 2000, 436: 473–480.
5. Ganeshan DM, Paulson E, Tamm EP, *et al*. Solid pseudo-papillary tumors of the pancreas: current update. Abdom Imaging, 2013, 38: 1373–1382.
6. Tian S, Quan H, Xie C, *et al*. YN968D1 is a novel and selective inhibitor of vascular endothelial growth factor receptor-2 tyrosine kinase with potent activity *in vitro* and *in vivo*. Cancer Sci, 2011, 102: 1374–1380.
7. Scott LJ. Apatinib: a review in advanced gastric cancer and other advanced cancers. Drugs, 2018, 78: 747–758.
8. Li J, Qin S, Xu J, *et al*. Apatinib for chemotherapy-refractory advanced metastatic gastric cancer: results from a randomized, placebo-controlled, parallel-arm, phase II trial. J Clin Oncol, 2013, 31: 3219–3225.

DOI 10.1007/s10330-018-0300-0
Cite this article as: Tang Y, Yang L, Yuan XL. Treatment of aggressive pancreatic solid pseudo-papillary neoplasms with apatinib plus S-1 chemotherapy: A case report and literature review. Oncol Transl Med, 2018, 4: 219–221.