Clinical Case Report

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Malignant jejunal gastrointestinal stromal tumor with history of prostate cancer

A case report

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Abstract

Rationale: The problem of the coexistence of gastrointestinal stromal tumor (GIST) with other neoplasms is complex, and carcinomas of prostate is one of the common types of GIST-associated cancers. Doubling time of GIST is about 3.9 months for high-risk GIST, and the treatment paradigm for GIST has required the integration of surgery and molecular therapy.

Patient concerns: A 70-year-old man with postoperative history of prostate cancer experienced fast-growing malignant jejunal GIST with multiple peritoneal metastases within 1 year.

Diagnoses: Enhanced computed tomography (CT) detected a neoplasm of small intestine with multiple peritoneal nodules and postoperative pathology confirmed GIST.

Interventions: Oral imatinib after surgery, at 400 mg per day, was used for 4 years.

Outcomes: The patient remains well, and the peritoneal nodules located in front of the rectum disappeared gradually.

Lessons: Physicians should be aware of possibility of GIST in patients with prostate cancer and can perform abdominal examination in these patients. For postoperative patients with prostate cancer, an yearly or half-yearly abdominal and pelvic cavity examination can be performed. Suspicion and timely work-up is necessary in these postoperative prostate cancer patients, especially when they have abdominopelvic pain.

Abbreviations: CA19-9 = carbohydrate antigen 19-9, CEA = carcinoembryonic antigen, CT = computed tomography, GISTs = gastrointestinal stromal tumors, MRI = magnetic resonance imaging, PSA = prostate-specific antigen.

Keywords: doubling time, gastrointestinal stromal tumor, imatinib, peritoneal metastasis, prostate cancer

1. Introduction

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal stromal tumors of the gastrointestinal tract, which appear to be related to the interstitial cells of Cajal of the myenteric plexus.[1] GISTs occur anywhere along the gastrointestinal tract; small intestine is the second most common primary site (30–35%), after the stomach (50–60%).[2] In small intestinal GISTs, the incidence of jejunal GISTs account for about 41.6%.[3] GISTs typically express KIT and have activating KIT mutations.[1] Imatinib mesylate is a selective inhibitor of the transmembrane receptor KIT.[4] The treatment paradigm for GIST has required the integration of surgery and molecular therapy.[5] Carcinomas of prostate was one of the common types of GIST-associated cancers.[6] Murphy et al[7] found a higher prevalence of prostate cancer before GISTs rather than after GISTs. We reported a case of a jejunal GIST with multiple peritoneal metastases and postoperative history of prostate cancer at the time of diagnosis, which grew twice as much in 2.5 months.

2. Case report

The patient has provided informed consent for publication of the case.

A 70-year-old man with postoperative history of prostate cancer was admitted to our hospital due to abdominal pain and progressive loss of appetite in August 2014. He began to suffer from periumbilical pain about 6 months, and a 4 cm small intestine tumor was found by abdominal enhanced computed tomography (CT) (Fig. 1). The lump was interlinked with the intestine, meanwhile, partial greater omentum and the wall of transverse colon thickened, and some area was nodular. The patient underwent prostate cancer surgery in November 2013. After surgery, he received oral bicalutamide for 6 months and

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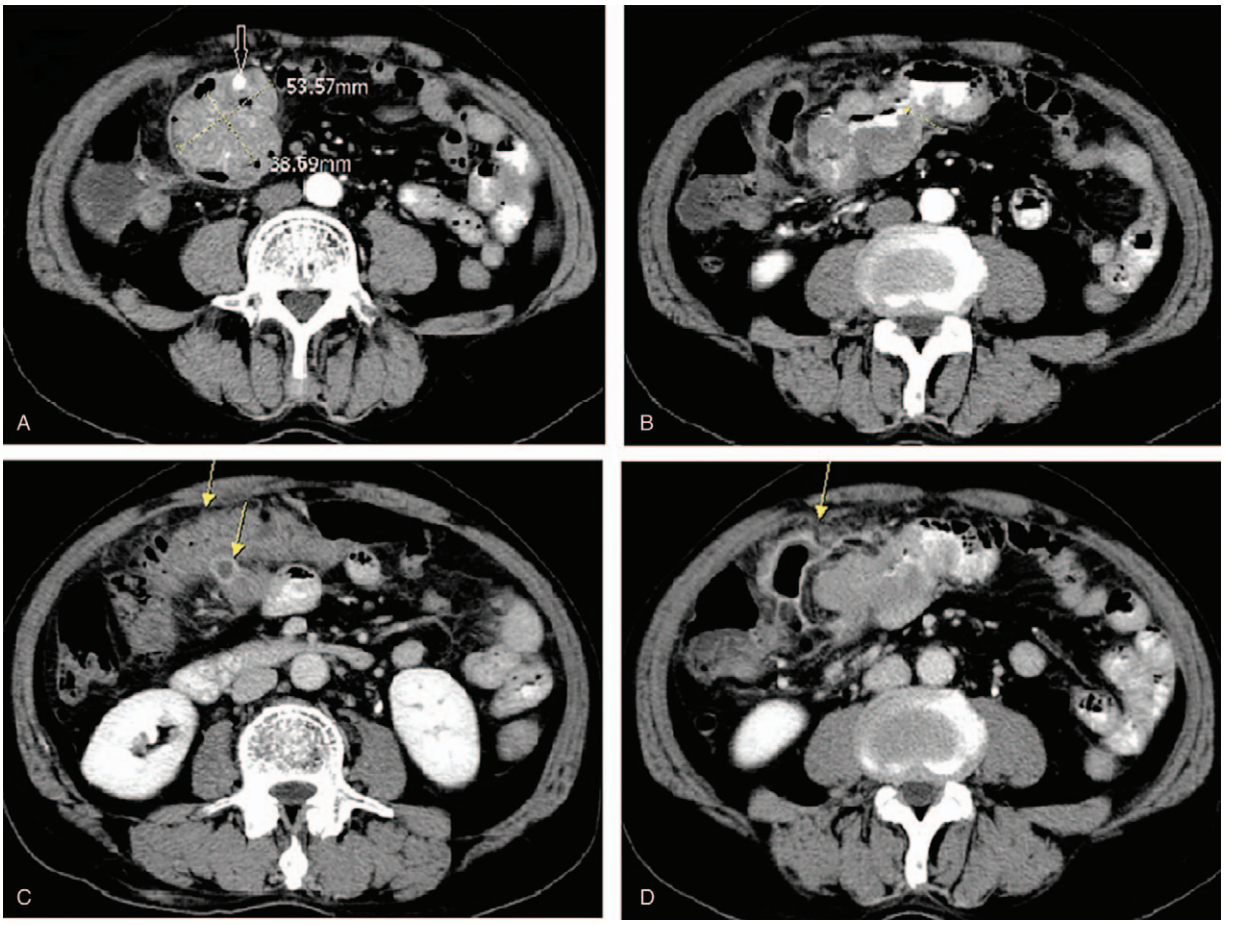

Figure 1. The patient came to our hospital for the first time and found abdominal mass. Axial contrast CT image (A) shows a neoplasm of small intestine with nodular calcification (coarse arrow), which size was about 39 × 54 mm and surrounds by intestinal tube. The mass is locally connected to the intestinal canal, as shown in the arrowhead (B). The tumor is surrounded locally by flocculent thickened or nodular like peritoneum (C, D). CT = computed tomography.

subcutaneous injection of leuprolide 6 times. Therefore, the metastasis of prostate cancer was suspected, but the prostate-specific antigen (PSA) was negative, so it overturned the diagnosis. After fully communicating with their families, they insisted on continuing conservative treatment such as endocrine therapy. But abdominal pain and distension aggravated in the last 2 months, meanwhile, weight loss was about 5 kg, so the patient came to our hospital for further treatment in November 2014. A contrast-enhanced CT scan of the abdominal and pelvic cavity showed a soft tissue-dense (about 9.3 cm × 7.8 cm) connected to the lumen of the small intestine and contained nodular calcification, which was associated with multiple abdominal and pelvic nodules (Fig. 2). But 2 and a 1/2 months ago, the tumor was about 4 cm in diameter, and the partial greater omentum and the wall of transverse colon thickened. Laboratory tests such as PSA, carbohydrate antigen 19–9 (CA19–9), and carcinoembryonic antigen (CEA) were negative. Microscopic examination of a biopsy specimen of the small intestine revealed high risk gastrointestinal stromal tumor, and immunohistochemical staining showed that the tumor cells were positive for cluster of differentiation 117 (CD117) and CD34. We discussed their condition with their families and suggested that patients took imatinib treatment until the tumor shrink and then considered surgery. But the families refused to take imatinib and asked for surgical treatment. Thus, the patient underwent laparotomy. The tumor was found arising from the jejunal initial segment. The cut surface was solid and 14 × 9 × 8.5 cm in size, and all peritoneal nodules except the one located in front of the rectum were excised. Microscopically, the tumor was composed of spindle cells. Mitosis was >10 per high-power fields. Immunohistochemically, the tumor was positive for CD117/CD34 and discovered on GIST-1, but negative for smooth muscle actin and S100. And Ki67 was about 30%. Based on these findings, the histopathological diagnosis was GIST of the small intestine. The patient recovered well and was discharged on postoperative day 16. Then the treatment of imatinib began with a dose 400 mg daily until today. The patient took medicine regularly every day and remained well 4 years after operation, without any signs of recurrence and any other symptoms of physical discomfort except occasional indigestion. Besides, the peritoneal nodules located in front of the rectum disappeared (Fig. 3).

3. Discussion

Gastrointestinal stromal tumor (GIST), although rare, is the most common mesenchymal tumor of the intestinal tract.[8] They are most common in the stomach (50–60%) and the small intestine (30–35%), but they are less frequent in the colon, rectum (5%) or the oesophagus (<1%).[2] The diagnosis of GIST depends on the morphology and immunohistochemical findings. The

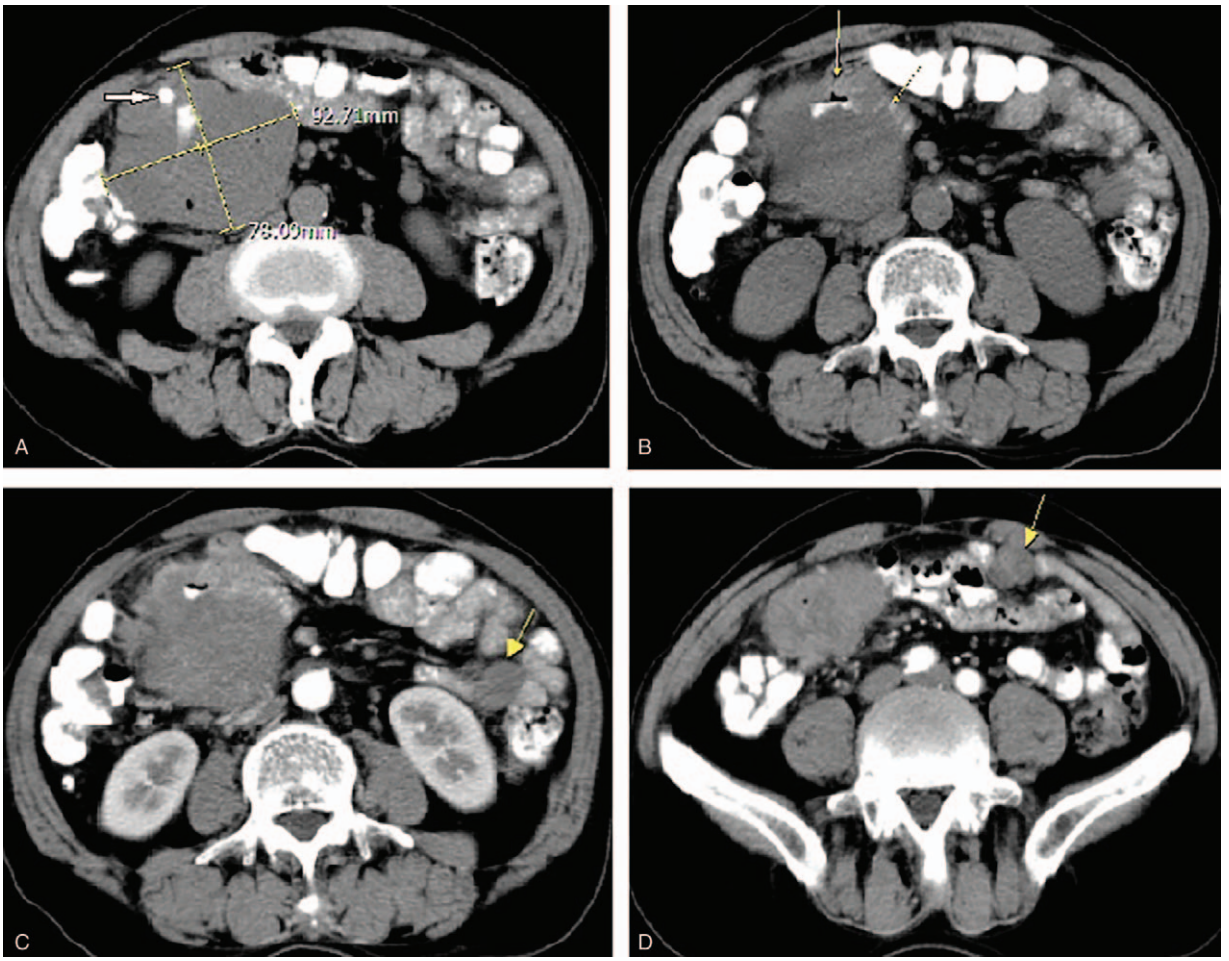

Figure 2. The patient came to our hospital for the second time and found the abdominal mass with calcification (coarse arrow) getting bigger, about 78 × 93 mm (A). The mass grows out of the lumen, communicating locally with the lumen. The arrow points to the jejunum (B). Multiple metastatic nodules were found in the abdominal cavity (C, D).

morphological features include a predominantly spindle cell type (70%), epithelioid cell type (20%), or mixed type (10%),[9] and in the majority of histologically suspected GISTs a combination of CD117 and DOG1 immunostaining is sufficient to confirm the histological diagnosis.[10] For GISTs, a higher risk grade was associated with a significantly shorter doubling time. Koizumi et al[11] reported that doubling time of GIST according to risk was 24.0 months for extremely low-risk plus low-risk GIST, 17.1 months for intermediate-risk GIST, and 3.9 months for high-risk GIST. Choi et al[12] reported that the mean tumor volume doubling time of gastric stromal tumor was 377.6 days. To our knowledge, this is the first report of so short doubling time. In 2.5 months, the tumor grew more than twice as much, and peritoneal flocculant thickening turned into abdominopelvic multiple nodules.

Coexistence of a few primary dissimilar neoplasms in one patient is a rare phenomenon. Liszka et al[13] reported that GISTs coexisted with other neoplasms in almost 27% of the study population, and a greater proportion of patients with a GIST localized in the small intestine and/or characterized by a very low risk of aggressive behavior. They tended to be finding during surgery by chance. But the problem of the coexistence of GISTs with other neoplasms is complex. Carcinomas of prostate was one of the common types of GIST-associated cancers.[6] Murphy et al[7] found a higher prevalence of prostate cancer before GISTs rather than after GISTs. In our case, pelvic enhanced magnetic resonance imaging (MRI) and abdominal and pelvic enhanced CT showed no other lesions before surgery for prostate cancer. But we found the jejunal neoplasm just 9 months later.

The treatment paradigm for GIST has required the integration of surgery and molecular therapy.[5] We know that surgical resection with a negative gross margin remains the mainstay of therapy for primary GISTs. Joensuu et al[14] summarized that about 60% of patients are cured by surgery. However, recurrence was common, and the 5-year actuarial survival rate was 54%[15] or 50.5%.[16] In 1998, mutations in the KIT oncogene were discovered in GISTs.[17] In 2001, inhibition of the KIT signal-transduction pathway was a promising treatment for advanced gastrointestinal stromal tumors,[18] and the survival time of the patients was significantly prolonged. Now imatinib is a first-line treatment for metastasis or recurrence of GISTs.[19] But there are some controversy about the treatment course of imatinib after radical surgery. Kang et al[20] found that postoperative adjuvant imatinib for 2 years was safe and could prolong the recurrence-free survival in patients with a high risk of recurrence after complete resection. Lin et al[21] found that patients with high-risk

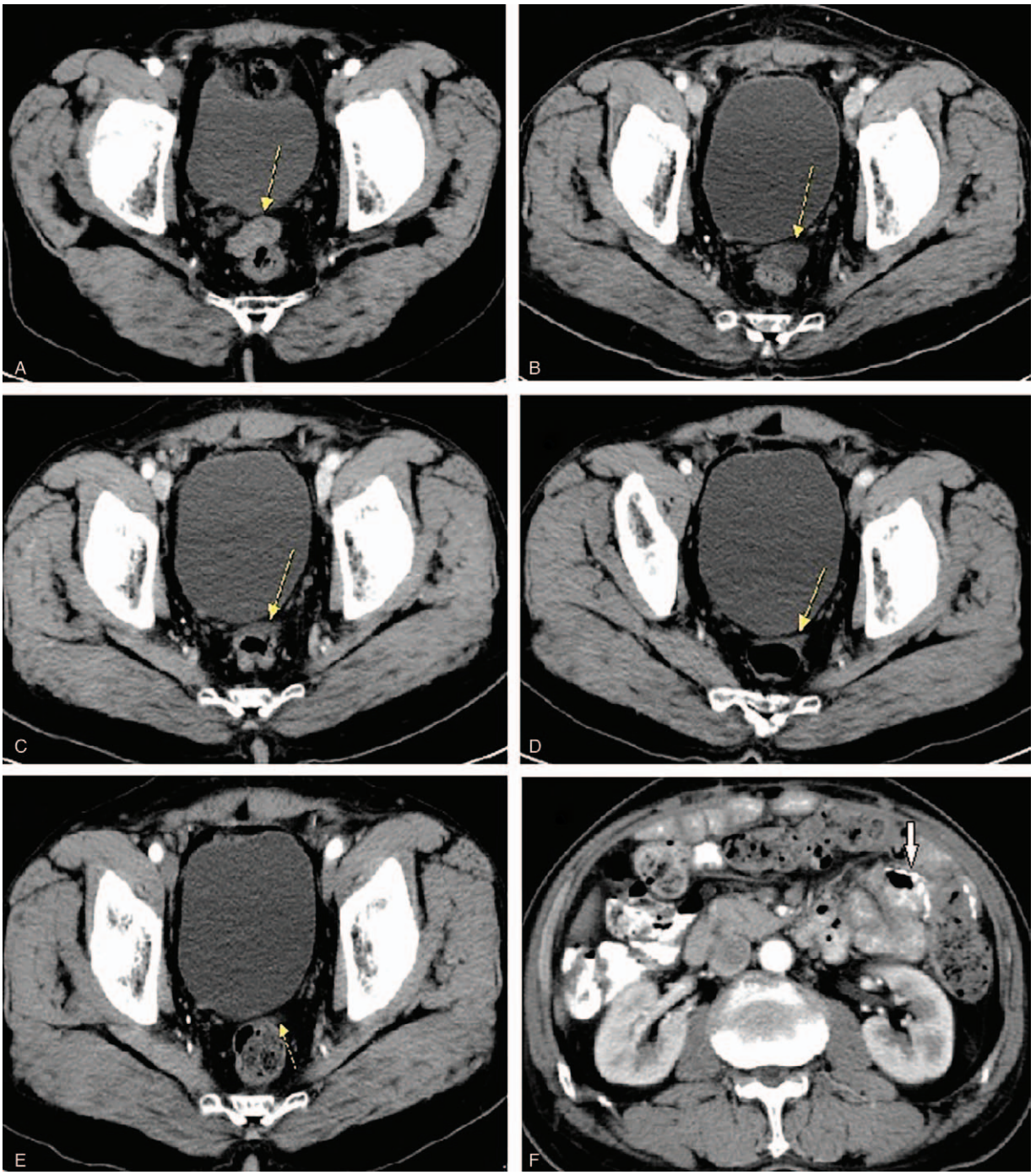

Figure 3. The patient remains well after operation, without any signs of recurrence, and the peritoneal nodules located in front of the rectum disappeared. A. Anterior rectal nodule before treatment (arrow). B. 3.5 months after operation and 3 months after take imatinib, the anterior rectal nodules show reduced volume and decreased density (arrow). C. The anterior rectal nodules become smaller after taking imatinib for 9 months. D. The peritoneal nodules located in front of the rectum become a linear shadow and locally triangular (arrow). E, F. No recurrence is seen at the anastomotic site and no other lesions are found in the abdominal and pelvic cavity. The density of the anterior rectal nodules is lighter than the previous.

GIST received imatinib treatment for at least 5 years could reduce the recurrence and improve the long-term survival. Although imatinib has a good effect on unresectable or metastatic gastrointestinal stromal tumors,[18,22,23] in our case, we recorded the postoperative status of small intestinal stromal tumors with peritoneal metastasis in relative detail by imaging data. We did not find any visible signs of recurrence or metastasis, and the unresectable one located in front of the rectum decreased in density and gradually becomed smaller in size. Now it becomes a linear shadow. The whole process took 4 years.

In conclusion, we reported a case of a jejunal GIST with multiple peritoneal metastases at the time of diagnosis, which grew twice as much in 2.5 months and had a postoperative history of prostate cancer. It was curatively resected before

imatinib therapy, and all peritoneal nodules except the unresectable one located in front of the rectum were excised. After surgery, imatinib has been taken. The patient remains well 4 years after the operation, without any signs of recurrence, and the peritoneal nodules located in front of the rectum disappeared gradually. Finally, we suggested that doctors should also perform abdominal examinations on patients with prostate cancer when performing CT and MRI pelvic examinations. For postoperative patients with prostate cancer, we recommend that they should have an abdominal and pelvic cavity examination for 1/2 a year or 1 year, especially when they have abdominopelvic pain.

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Author contributions

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