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CASE REPORT

Waist subcutaneous soft tissue metastasis of rectal mucinous adenocarcinoma: A case report

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Abstract

BACKGROUND

Rectal mucinous adenocarcinoma (MAC) is a rare pathological type of rectal cancer with unique pathological features and a poor prognosis. It is difficult to diagnose and treat early because of the lack of specific manifestations in some aspects of the disease. The common metastatic organs of rectal cancer are the liver and lung; however, rectal carcinoma with metastasis to subcutaneous soft tissue is a rare finding.

CASE SUMMARY

In this report, the clinical data, diagnosis and treatment process, and postoperative pathological features of a patient with left waist subcutaneous soft tissue masses were retrospectively analyzed. The patient underwent surgical treatment after admission and recovered well after surgery. The final pathological diagnosis was rectal MAC with left waist subcutaneous soft tissue metastasis.

CONCLUSION

Subcutaneous soft tissue metastasis of rectal MAC is rare, and it can suggest that the tumor is disseminated, and it can appear even earlier than the primary malignant tumor, which is occult and leads to a missed diagnosis and misdiagnosis

clinically. When a subcutaneous soft tissue mass of unknown origin appears in a patient with rectal cancer, a malignant tumor should be considered.

Key Words: Colorectal cancer; Rectal mucinous adenocarcinoma; Cancer metastasis; Subcutaneous soft tissue; Hematogenous; Case report

Core Tip: Mucinous adenocarcinoma (MAC) is a relatively rare pathological subtype of colorectal cancer. Patients with rectal MAC are more likely to have abdominal lymph node metastasis, peritoneal metastasis, and abdominal implantation and have a worse prognosis and lower survival rate. Early detection, diagnosis, and treatment of rectal MAC can improve the prognosis of patients. We present a rare case of left waist subcutaneous soft tissue metastasis, hoping to provide some experience for the early clinical diagnosis and treatment of this disease.

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INTRODUCTION

Colorectal cancer is the third most common malignant tumor in the world, and the incidence and mortality of colorectal cancer in China and the world are increasing. In 2020, the report of China Cancer statistics shows that the incidence and mortality of colorectal cancer rank second and fifth, respectively, among all malignant tumors, with 555000 new cases and 286000 deaths of colorectal cancer occurring in China in 2020[1]. Globally, the fatality rate is the fourth highest among all malignancies[2]. Mucinous adenocarcinoma (MAC) is a relatively rare pathological subtype of colorectal cancer, accounting for only 5%-20%[3]. It has unique clinicopathological features and a relatively low incidence, but it is associated with a poor prognosis. Previous studies have indicated that compared with non-MAC (NMAC) patients, patients with rectal MAC are more likely to have abdominal lymph node metastasis, peritoneal metastasis, and abdominal implantation and have a worse prognosis and lower survival rate[4]. Therefore, early detection, diagnosis, and treatment of rectal MAC can improve the prognosis of patients. Waist subcutaneous soft tissue metastasis of rectal MAC is rare. The clinical and pathological features of rectal MAC were discussed by reporting a case of left waist subcutaneous soft tissue metastasis, hoping to provide some experience for the early clinical diagnosis and treatment of this disease.

CASE PRESENTATION

Chief complaints

On June 17, 2023, a 49-year-old man was admitted to our hospital with a chief complaint of a mass at the left waist for more than 10 years.

History of present illness

The mass was an approximately 1 cm × 1.5 cm mass bulging from his left waist at the beginning, without pain, rupture, and skin ulceration. Two weeks prior, the mass was approximately 2 cm × 3 cm and caused the patient to have subcutaneous soft tissue pain.

History of past illness

His medical history included radical Dixon resection of rectal cancer (7-9 cm from the anal margin) in April 2019. The diagnosis of postoperative pathology was ulcerative low-differentiated adenocarcinoma and local MAC infiltrating the subserosal fibrous adipose tissue, with 3 of 14 mesorectal lymph nodes involved. A subsequent biopsy and the immunohistochemistry (IHC) findings were as follows: CKI8 (++), CDX2 (++), p53 (++), MUC2 (+), MLHI (+), PMS2 (+), Ki-67 (+ 10%), CD56 (+), p40 (-), Vimentin (-), Syn (-), and CgA (-). The diagnosis of pathology and clinical was reported as stage T3N1M0 and IIIB. The left waist mass became smaller when the patient underwent one cycle of chemotherapy with CapeOx (capecitabine 1.5 g po *bid*) and 7 cycles of oxaliplatin (oxaliplatin 250 mg ivgtt *qd*) in a local hospital after radical Dixon resection of rectal cancer (Figure 1).

Personal and family history

The patient had no relevant personal or family history.

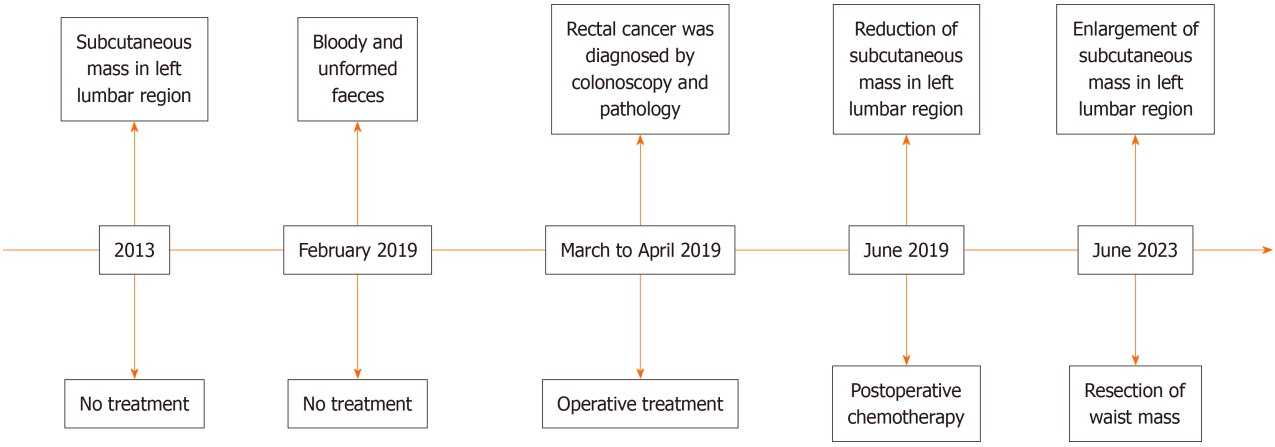

Figure 1 Timeline of the diagnosis and treatment of the patient.

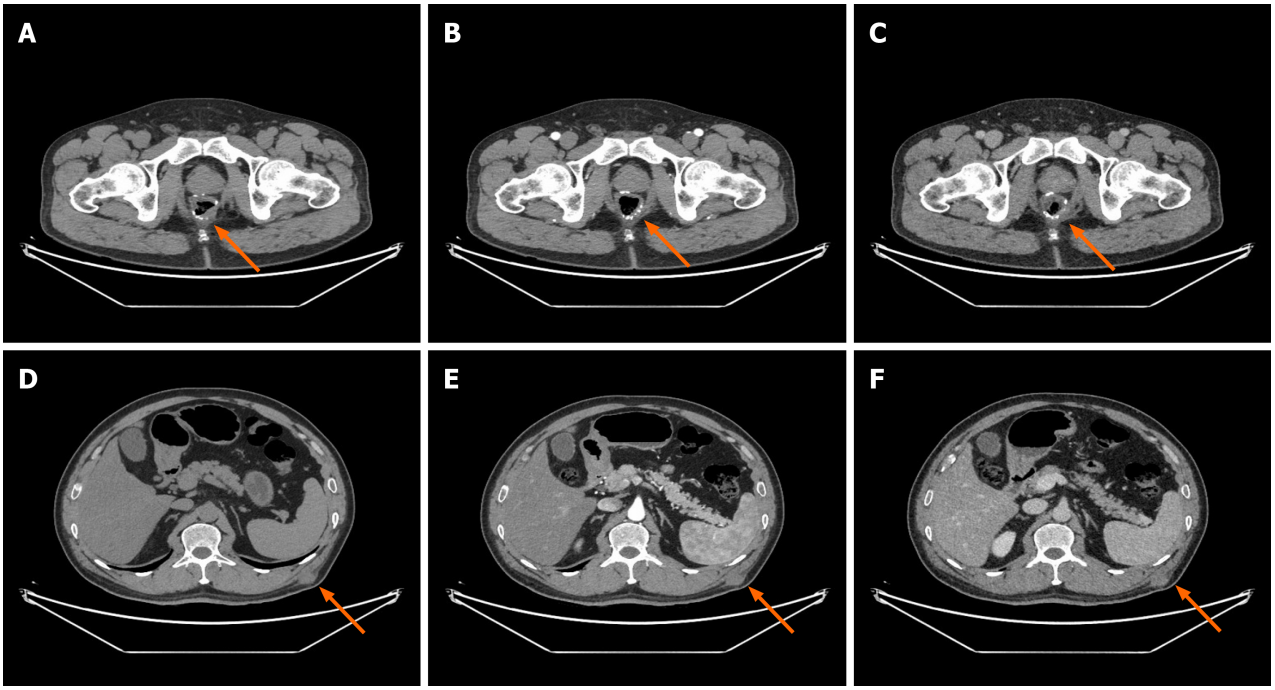

Figure 2 Contrast-enhanced abdominal computed tomography. A: Rectal anastomosis plain scan; B: Rectal anastomosis arterial phase scan; C: Rectal anastomosis venous phase scan; D: Plain scan of the soft tissue mass of the left waist; E: Arterial phase scan of the soft tissue mass of the left waist; F: Venous phase scan of the soft tissue mass of the left waist.

Physical examination

Physical examination revealed a firm and relatively clear border subcutaneous tissue mass with a size of approximately 2 cm × 3 cm at the left waist without skin redness, swelling or warming in this patient.

Laboratory examinations

Laboratory examination revealed the following: White blood cell (WBC) 10.49 × 10^9/L, interleukin-2 (7.05 pg/mL), interleukin-4 (7.33 pg/mL), interleukin-5 (3.96 pg/mL), interleukin-6 (7.10 pg/mL), interleukin-10 (7.09 pg/mL), interleukin-12 P70 (4.86 pg/mL), and tumor abnormal protein (TAP) 160.762 μm^2. The patient's carcinoembryonic antigen (CEA), alpha-fetoprotein (AFP), and carbohydrate antigen (CA)19-9 levels were normal.

Imaging examinations

Imaging examination and contrast-enhanced abdominal computed tomography (CT) revealed a soft tissue mass in the subcutaneous tissue plane of the left waist without obvious enhancement in the arterial phase and portal phase, no abnormal strengthening was observed at the anastomosis, and no fluid or enlarged lymph nodes were found in the abdominal cavity or pelvis (Figure 2). The ultrasound revealed a solid mass of 21 mm × 16 mm in size, irregularly bound and without obvious blood flow, located in the subcutaneous soft tissue of the left waist (Figure 3). Colonoscopic exa-

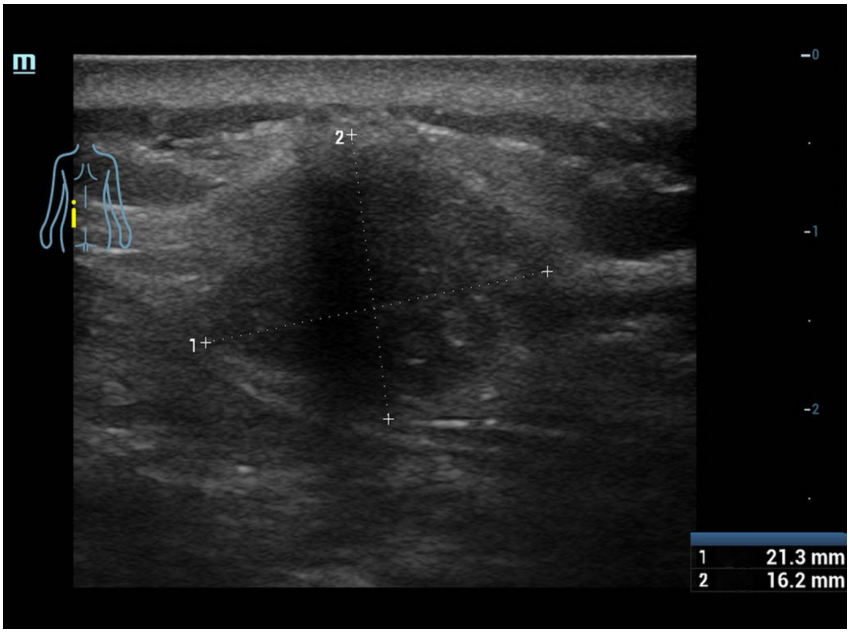

Figure 3 Ultrasound: A solid mass of 21 mm × 16 mm in size, irregularly bound and without obvious blood flow, located in the subcutaneous soft tissue of the left waist.

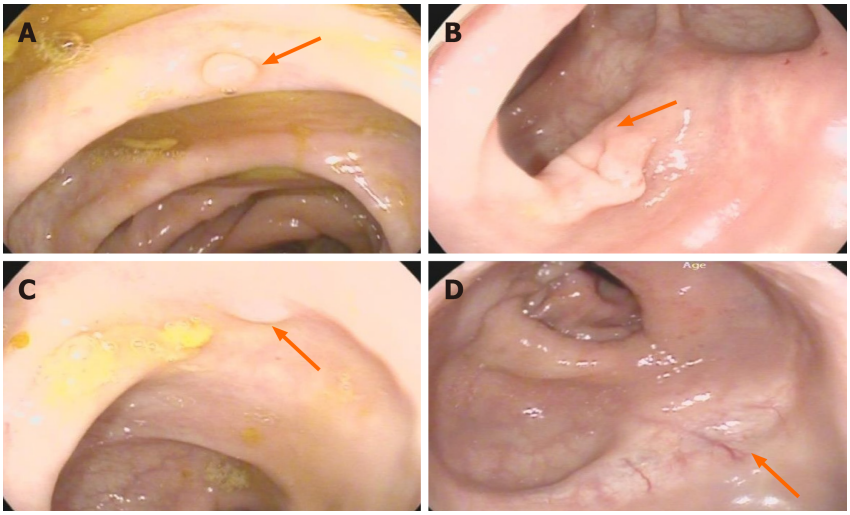

Figure 4 The colonoscopy results of this admission. A: Low-grade tubular adenoma (ascending colon); B: Hyperplastic polyp (transverse colon); C: Hyperplastic polyp (sigmoid colon); D: Anastomotic scar.

mination revealed three polypoid lesions approximately 0.2-0.3 cm in size in the ascending colon, transverse colon and sigmoid colon and an anastomotic scar approximately 3 cm from the anal margin (Figure 4).

FINAL DIAGNOSIS

According to auxiliary examination results and clinical history, skin soft tissue malignancy was considered.

TREATMENT

The patient underwent left waist mass resection in our hospital on June 21, 2023. The intraoperative discovery was that the tumor was located in the subcutaneous fat and fascia layer, with a size of 2.5 cm × 2 cm and a relatively clear border, and the bottom of the tumor was adhered to the muscle layer. The mass and part of the adherent muscle tissue were completely resected (Figure 5). Postoperative analgesia and anti-infection treatment were given to the patient.

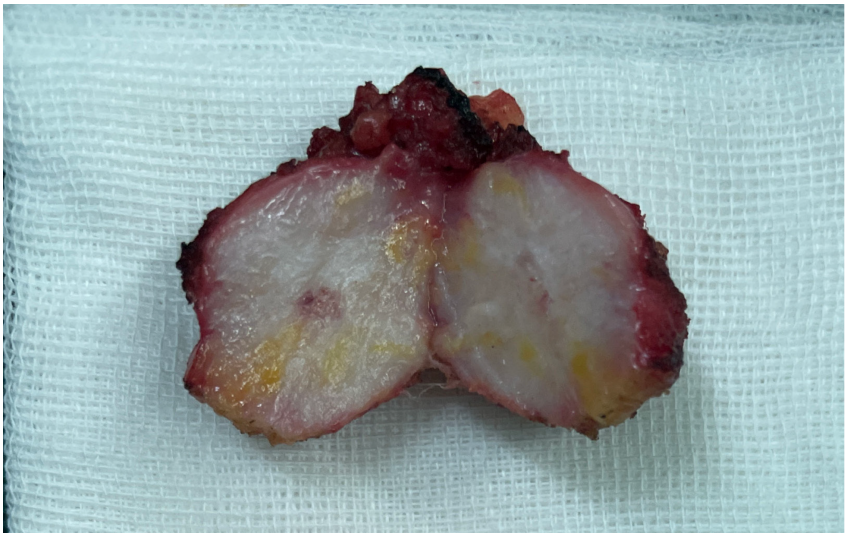

Figure 5 Soft tissue masses resected from the left waist subcutaneous soft tissue mass during surgery.

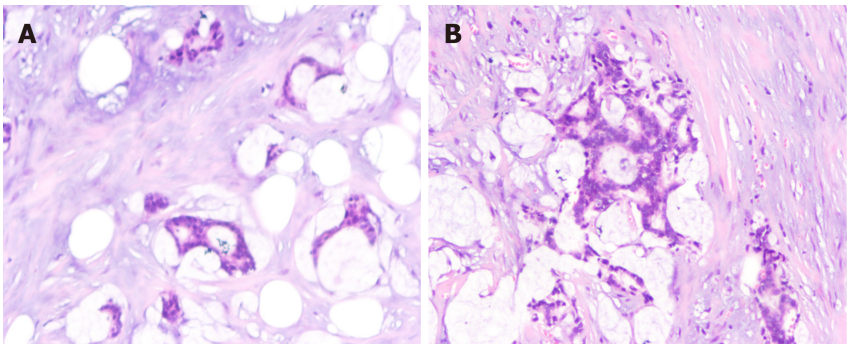

Figure 6 Pathological examination of the left waist mass. A: Mucus is visible; B: Mucus is seen around adenocarcinoma cells (hematoxylin and eosin, × 200).

OUTCOME AND FOLLOW-UP

The postoperative pathologic diagnosis of the left waist mass (hematoxylin and eosin) was MAC, nerve invasion and transfer (Figure 6). Subsequent biopsy and IHC showed the following: MUC2 (+), MUC5AC (+), CK20 (+), CDX-2 (+), CK (P) (+), and Ki-67 (index 80%) (Figure 7). The patient recovered well after surgery with good wound healing and was successfully discharged from the hospital. The patient had no local tumor recurrence or distant metastasis at the 3-month follow-up.

DISCUSSION

MAC is a relatively rare pathological subtype of rectal cancer. It is frequently diagnosed by pathological paraffin sectioning and IHC. Compared with NMAC, MAC has a larger primary lesion, deeper invasion, higher rates of lymph node metastasis and distant metastasis, and more metastatic sites, so the prognosis is relatively poor[5]. In addition to clinical features, rectal MAC also has unique pathological features, which are also associated with poor prognosis. One of the most important pathological features of MAC is the presence of a large number of mucins outside the tumor cell, including MUC1, MUC2, and MUC5AC. Studies have found that MUC2 and MUC5AC are closely related to colorectal cancer. Research shows that overexpression of MUC2 can form mucous layers in the colon mucosa, which can fight against self-antitumor immunity, thus promoting tumor development[6,7]. Clinical studies have shown that loss of MUC5AC expression can serve as an indicator of more aggressive colorectal tumors, and patients with negative expression of MUC5AC have lower survival rates[8]. Another study has shown that mucoid substances exert mechanical pressure on surrounding tissues, making it easier for tumor cells to invade the intestinal wall and surrounding tissues. At the same time, the phagocytosis of lymphocytes on mucus facilitates the spread of tumor cells in regional lymph nodes, and mucosaccharides in mucus can interfere with the recognition of tumor cells by immune cells around blood vessels and the lymph node cortex and help tumor cells spread[9]. Immunohistochemical results of the waist metastatic lesions in this patient showed MUC2 (+) and MUC5AC (partial +). The results were consistent with the pathological features of

Table 1 Cases of rectal cancer with cutaneous metastasis

Ref.	Age (yr)	Sex	Histology	Stage	Primary cancer treatment	Interval months	Skin mets location	Skin mets morphology	Skin mets treatment	Survival (follow-up time in months)
Hayashi *et al* [14], 2003	55	M	Adenocarcinoma mucinous	-	LAR	4	Perineum	Nodules	None	-
Sarid *et al*[15], 2004	60	F	Adenocarcinoma mucinous	IIIB	NR + LAR + ACR	16	Chest	Ulcers	WLE	No (56)
Tan *et al*[16], 2006	70	M	Adenocarcinoma mucinous	IIIB	LAR + AC	24	Back	Nodules	WLE, C	-
Saladzinskas *et al*[17], 2010	64	M	Adenocarcinoma mucinous	IIA	NR + LAR	42	Face	Ulcers	WLE	Yes (7)
Balta *et al*[18], 2012	46	M	Adenocarcinoma mucinous	IIIB	Colostomy	12	Perineum	Ulcers	None	-
de Miguel Valencia *et al* [19], 2013	55	M	Adenocarcinoma mucinous	IIIB	NCR + APR + AC	18	Multiple	Nodules	None	No (-)
Dehal *et al*[10], 2015	47	M		IV	CR	1	Perineum	Nodules	R	Yes (12)

-: Data not reported; F: Female; M: Male; Mets: Metastasis; LAR: Low anterior resection; NR: Neoadjuvant radiation; ACR: Adjuvant chemoradiation; AC: Adjuvant chemotherapy; NCR: Neoadjuvant chemoradiation; APR: Abdominoperineal resection; CR: Chemoradiation; WLE: Wide local excision; C: Chemotherapy; R: Radiation.

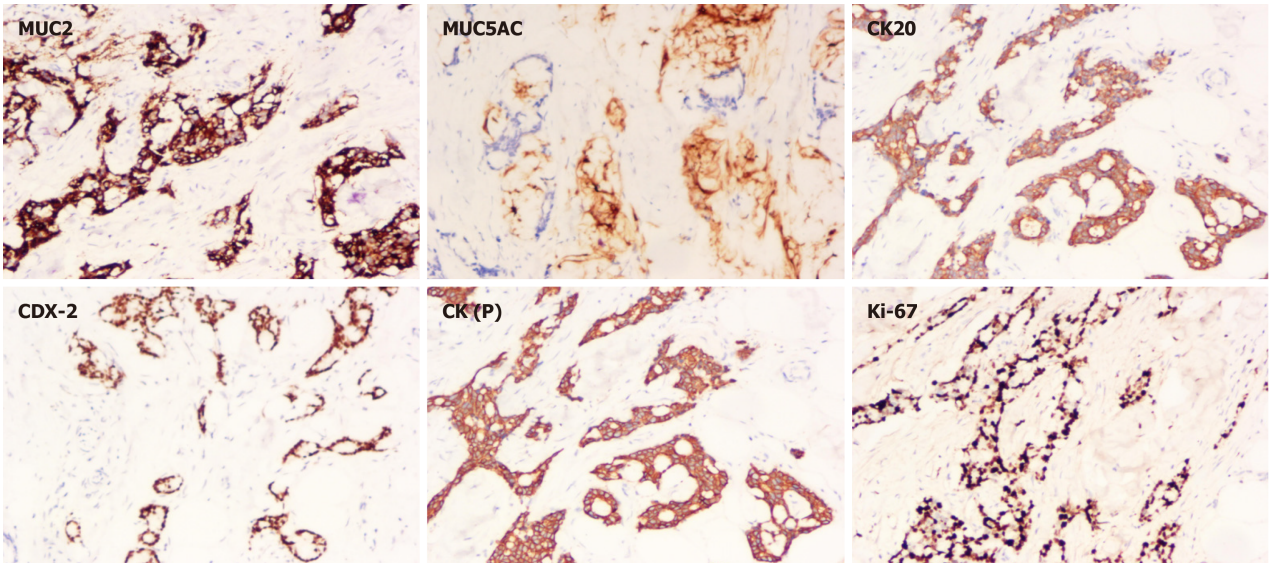

Figure 7 MUC2 (+), MUC5AC (partially +), CK20 (+), CDX-2 (+), CK (P) (+), Ki-67 (index 80%) (immunohistochemistry, × 200).

rectal MAC. However, the effect of the proportion and composition of mucous in tumor tissue on the prognosis of patients still needs to be studied further. Colorectal cancer metastasis is more common in the liver and lung, and waist subcutaneous soft tissue metastasis of rectal cancer is rare. We only found 7 cases[10] of cutaneous metastases from MAC of the rectum in the English-language literature (Table 1). The sites where MAC mucinous metastases were reported included the perineum, chest, abdomen and face. It may be related to the biological characteristics of MAC, but the specific mechanism of skin or subcutaneous soft tissue metastases that are far from the primary site is not clear, and these may occur through a blood-derived pathway. Past research has shown that if tumor cells invade blood vessels, skin metastases at distant sites are present, while local recurrence at the site of the primary tumor is more common if the tumor involves lymphatic vessels[11]. The special feature of this patient is that the occurrence time of subcutaneous soft tissue metastases at the left waist may be earlier than the diagnosis time of rectal cancer, and rectal MAC is very likely to develop distant subcutaneous soft tissue metastases through blood origin at an early stage. Because this patient had no early obvious clinical symptoms from this waist subcutaneous mass, the patient did not pay attention to it and was not treated until the tumor was recently found to be larger than before and accompanied by pain, which affected the prog-

nosis of the patient. In addition, the patient's preoperative tests showed that the WBC count, as well as various interleukin indicators, was above the normal range, and combined with the patient's history of rectal cancer, metastasis from rectal adenocarcinoma should have been considered. Many studies have shown that interleukin and other inflammatory factors are closely related to tumor occurrence and development and can promote tumor progression. For example, interleukin-6 is a major cytokine in the tumor microenvironment and is overexpressed in almost all tumors. Interleukin-6 promotes tumor development by regulating all features of cancer and multiple signaling pathways, including apoptosis, survival, proliferation, angiogenesis, invasion, metastasis, and metabolism. In addition, interleukin-6 protects cancer cells from treatment-induced DNA damage, oxidative stress, and apoptosis by promoting repair and induction of counter-signals, leading to treatment resistance[12]. In other aspects, the TAP in this patient was significantly higher than the normal range, and combined with the patient's history of rectal cancer, it also helped us to diagnose tumor recurrence and metastasis. Studies have shown that TAP can be combined with CEA, AFP, CA19-9, and other tumor markers for the early diagnosis of cancer and can also be used for postoperative tumor monitoring[13]. Of course, there are still some deficiencies in this report, such as the failure of the patient to undergo gene detection positron emission tomography (PET)/CT and other examinations, which may affect the overall evaluation of the patient's condition, the implementation of the treatment plan and postoperative treatment follow-up. We will follow up with the patient closely and adjust the treatment plan in time to observe the changes in the patient's condition in the future.

CONCLUSION

The incidence of rectal MAC is low. However, the malignancy rate is high, the local recurrence and distant metastasis rates are higher, the prognosis is poor, and the survival of patients is affected. Distant subcutaneous soft tissue metastasis of rectal MAC is rare. However, for patients with a history of malignant tumors, these should be considered to be malignant tumors when they appear in the skin and a subcutaneous soft tissue mass without a clear cause. We need to use interleukin, tumor markers, enhanced CT, gastroenteroscopy, PET/CT, puncture biopsy, and other means to evaluate the patient's condition. Finally, it is recommended to surgically remove the lesion and conduct pathological examination IHC and even gene detection to guide follow-up treatment.

FOOTNOTES

Co-first authors: Zi-Xing Gong and Guo-Lei Li.

Author contributions: Gong ZX and Li GL contributed equally to this work as co-first authors; Gong ZX, Li GL and Dong WM designed the study and wrote the manuscript; Xu Z and Dong WM collected and analyzed the data; Li R, Lv WX and Yang J prepared figures; Xing W and Li ZX was in charge of patient treatment and designed the paper. All authors have read and approved the final manuscript.

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