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Rare squamous cell carcinoma of the jejunum causing perforated peritonitis: A case report

Abstract

BACKGROUND

Adenocarcinoma has the highest incidence among malignant tumors of the small intestine (SI). Squamous cell carcinoma (SCC) often occurs in organs covered with squamous epithelium. Primary or metastatic squamous cell carcinoma originating from the small intestine is very rare, with very few cases reported in the literature.

CASE SUMMARY

This case report refers to a 69-year-old man who developed abdominal pain after lunch. After admission, an abdominal CT scan revealed perforation of the alimentary canal and multiple abnormal low-density lesions in his liver. During the laparotomy, an approximately 4 cm × 3 cm-sized solid tumor was found in the jejunum, located 30 cm from the Treitz ligament, with a perforation. An intestinal segment of approximately 15 cm was removed, including the perforated portion. The pathological outcome was squamous cell carcinoma. In combination with liver imaging, a diagnosis of small intestinal squamous cell carcinoma with multiple liver metastases was considered. The patient expired from hepatic failure one month after the operation.

CONCLUSION

SI tumors are very rare compared to other digestive organs. Due to its insidious onset, the diagnosis of this disease is usually delayed. Clinicians must pay close attention to digestive symptoms such as persistent abdominal pain and melena.

Key Words: Squamous cell carcinoma; Jejunal perforation; Peritonitis; Abdominal CT scan; Case report

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Core Tip: Squamous cell carcinoma (SCC) in the small bowel (SI) is a rare pathologic category. Clinical symptoms are not evident, and it is challenging to determine whether it is the small intestine's primary or metastatic SCC. This case describes a 69-year-old male patient diagnosed with SCC of the SI and hepatic metastases. Effective diagnosis and early treatment are vital in improving the prognosis of malignant small bowel tumors. Radical resection should be undertaken if no metastases are found.

INTRODUCTION

Small intestinal (SI) tumors are very rare compared to other digestive organs[1]. The incidence of small bowel tumors accounts for only 0.6% of all malignant tumors, including about 1%-3% of gastrointestinal malignancies[2]. Previous studies of malignant tumors have reported that approximately 30% to 50% are adenocarcinoma, 25% to 30% are carcinoid, and 15% to 20% are lymphoma[3]. Primary squamous cell carcinoma (SCC) of the SI is extremely rare, with only a few reports in the literature[4-8]. This report describes a surgically treated patient with SCC arising from the jejunum with perforated peritonitis and multiple liver metastases.

CASE PRESENTATION

Chief complaints

His main complaint was epigastric pain after eating, nausea and vomiting, and then gradually full abdominal distension.

History of present illness

The patient developed epigastric pain and nausea half an hour after lunch. He then began vomiting; the vomitus was the stomach contents. Finally, he experienced full abdominal distension.

History of past illness

The patient was diagnosed with hypertension and diabetes, which were well-controlled with oral medications.

Personal and family history

The patient had no history of squamous cell carcinoma, and his family was negative for cancer.

Physical examination

After admission, his blood pressure was 125/71 mmHg, heart rate was 89 bpm, and body temperature was 36.7 °C. Abdominal tenderness, rebounding pain, muscle tension, and acute peritonitis were diagnosed. Notably, no enlarged lymph nodes were found during the physical examination.

Laboratory examinations

Blood analysis revealed a white blood cell count of 10.96 × 10^9/L, hemoglobin concentration of 124 g/L, neutrophils count of 8.96 × 10^9/L, and rapid C-reactive protein level of 53 mg/L. Notably, creatinine level of 141.7 Umol/L, albumin level 40 g/L, alanine aminotransferase, and aspartate aminotransferase are normal, glucose level 15.6 mmol/L, prothrombin international normalized ratio was 1.14, and D-dimer of 0.77 mg/L were reported.

Imaging examinations

The computed tomography (CT) scan showed that the small intestinal wall of the left upper abdomen was irregularly thickened, and free gas appeared in the abdominal

cavity. Multiple round low-density nodules of varying sizes can be seen in the liver parenchyma (Figure 1).

FINAL DIAGNOSIS

Postoperative pathology showed an approximately 4 cm × 3 cm × 1 cm-sized ulcerative tumor of the small intestine from the jejunum, which had infiltrated the entire thickness of the intestinal wall. Tumor cells present as a poorly differentiated carcinoma, growing in nests, and intracellular dyskeratosis is visible (Figure 2A and B). No tumor cells were seen in the corresponding mesenteric adipose tissue and lymph nodes. Immunohistochemical findings demonstrated that cytokeratin and antioncogene are strongly positive (Figure 2C and D). In conclusion, all results align with the diagnosis of squamous cell carcinoma.

TREATMENT

The laparotomy revealed that the small intestine was extensively edematous. A mass-like lesion was about 4 cm in diameter with perforation (Figure 3) was identified. An intestinal segmental resection of about 15 cm, including the perforation site and the corresponding mesentery, was removed. An end-to-end intestinal anastomosis was performed, and the abdominal cavity was flushed with physiological saline solution.

OUTCOME AND FOLLOW-UP

The surgery was completed successfully. Palliative chemotherapy combined with immunotherapy was recommended, according to the opinion of chemotherapy specialists. Due to the patient's poor physical condition, his family refused further treatment and only relieved his pain. The patient was discharged on postoperative day 6. However, he had advanced-stage malignancy and expired from hepatic failure one month after the operation.

DISCUSSION

The small intestine (SI) represents the longest part of the digestive tract, about 75% of the total length of the gastrointestinal canal and more than 90% of the mucosal surface. However, the small intestine rarely develops malignant tumors[9]. The unique environment in the small bowel, including complex factors such as pH、immune function, and various enzymes, may be related to the low incidence of small bowel tumors[10]. Small bowel tumors are rare globally, and according to the "age standard of the world population", the global incidence rate is less than 1.0 per 100000, ranging from 0.3 to 2.0[11]. SCC is even rarer among SI malignancies. Generally, SCC occurs in parts of the body covered by squamous epithelium, such as the skin, oral cavity, esophagus, and cervix. Some organs not covered by squamous epithelium can develop SCC through squamous epithelial metaplasia, such as the bronchus and gallbladder. SCC of the SI is extremely rare compared to other gastrointestinal tumors, with SCC accounting for approximately 2% among 1312 specimens of small intestinal tumors[12]. More commonly, SCC detected in the intestine represents metastatic cancer from other organs. Lung cancer commonly metastasizes to the SI[13-15]. Other cancers known to metastasize to the SI include mandibular gingiva, esophagus, and cervix[16-20]. Metastatic SCC of the SI is 2.5 times more common than primary SCC of the SI at autopsy[21].

The origin of primary SCC of the SI may be related to the malignant transformation of undifferentiated basal cells of the small intestinal mucosal epithelium. There are three possible mechanisms of SCC developing in the SI: (1) Pluripotent stem cells differentiate into malignant squamous cells; (2) malignant transformation of ectopic squamous epithelium; and (3) Malignant changes in squamous metaplasia caused by chronic mucosal damage[22]. These three pathways were supported by Platt *et al*[23]. The diagnosis of SCC must be rigorous, and key considerations are: (1) The characteristics of a malignant tumor, such as the apparent atypia and nested distribution; (2) the characteristics of the epithelial cells, such as the formation of a keratinized pearl; (3) lack of glandular components and glandular epithelium; and (4) no evidence of involvement of primary squamous cell carcinoma of other organs. Pathologically, it is challenging to

identify tumor cells as a primary or metastatic feature of SCC in the SI, especially when metastatic tumors reach mucosal surfaces[24]. For rare SCC of SI, when the histology is atypical and the cytokeratin and intercellular bridge structure are not obvious, it should be distinguished from carcinoids in the SI. Immunohistochemistry and neuroendocrine granules can be used to make such a differentiation.

In this case study, the patient was admitted to hospital with acute abdominal pain. Emergency surgery was performed because of peritonitis due to jejunal perforation, identified by relevant imaging and physical examinations. Postoperative pathology noted the disorderly growth of the squamous epithelial cells in large nests with pink keratin in the center. Immunohistochemical findings demonstrated that cytokeratin-5/6 and antioncogene P40 are both strongly positive. Additionally, no other tissues or organs yield positive findings, including respiratory, alimentary, and urogenital tracts.

In contrast, computed tomography imaging identifies multiple low-density masses in the liver. The patient had no history of squamous cell carcinoma, so a diagnosis of SCC of the SI, adenocarcinoma, and carcinoids is excluded. Despite showing multiple lesions in liver imaging, the patient refused to undergo a contrast-enhanced MRI or liver puncture for pathology, due to poor physical condition. The multiple liver metastases of small intestinal squamous cell carcinoma *via* hematogenous metastases were the considered diagnoses and may be related to the liver's perfusion of the portal vein system. There is currently no postoperative adjuvant therapy for small bowel squamous cell carcinoma other than surgical resection worldwide. Chemotherapy (Taxanes and Platinums) combined with immunotherapy was recommended, referring to the treatment for esophageal and lung squamous cell carcinoma, but with no evidence-based medicine. His family refused further medical treatment due to his poor physical condition and only relieved his pain. He expired from hepatic failure one month after the operation.

Neoplasms of the small intestine are rare, and several different histological types of cancer can occur in the SI. The clinical symptoms are not specific. It is challenging to access the small intestine with conventional endoscopy, making the diagnosis of small

intestinal tumors difficult. Most patients are hospitalized for complications of the disease, with surgical R0 resections challenging because it is often in the advanced stages of the disease. Capsule endoscopy is considered the best way to visualize the entire small intestine. It is also considered the first diagnostic method for gastrointestinal bleeding of unknown origin after a negative upper gastrointestinal endoscopy and colonoscopy. Many advances have been made in the clinical treatment of adenocarcinoma, stromal and neuroendocrine tumors arising from the small intestine[25]. As small intestinal squamous tumors are rare, more extensive cases and studies are necessary to achieve a well-designed clinical trial. The comprehensive treatment of small intestinal squamous cell carcinoma is challenging and requires further medical research. Once a small bowel tumor is diagnosed, radical resection should be performed as soon as possible, representing resections of at least 10cm of the involved region and the corresponding mesenteric lymph nodes to improve overall survival[26].

CONCLUSION

Malignant tumors of the SI are uncommon cancers and are easily misdiagnosed in the clinic. Therefore, most small bowel tumors are in the advanced stages when patients are admitted to the hospital. Early detection and diagnosis are of great significance for the optimal prognosis of patients. Clinicians should pay close attention to the symptoms of patients presenting with acute abdominal pain, such as acute peritonitis, bowel obstruction, and intussusception, during clinical diagnosis and treatment. Surgical resection is currently the most effective treatment for malignant small intestine tumors. It is also necessary to treat the patient's underlying disease to assist individuals in restoring their health. Further clinical studies and reports of similar cases are required to improve our knowledge of SCC in the SI and ensure the best clinical outcomes.

Figure 1 Images from abdominal computed tomography scan. A: Uneven thickening of small intestinal wall with viscus perforation (arrow in A); B: Free gas outside intestine but in the abdomen (arrow in B); C: The liver parenchyma had multiple round low-density nodules of varying sizes (arrows in C).

Figure 2 Pathological and Immunohistochemical staining findings. A and B: Pathological findings from surgical specimen; the lesion showed a serosal penetration (A); diffuse and nested growth of tumor cells can be seen and intracellular dyskeratosis is visible (B); C and D: Immunochemistry demonstrated the expression of cytokeratin-5/6, and antioncogene P40 is strongly positive.

Figure 3 Exploratory laparotomy results. A: The perforation of jejunal segment with purulent surface is noted; B: the enteric cavity showed a deep ulcer lesion.

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