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Case Report

Duodenal metastasis seven years after resection of hepatocellular carcinoma: a case report

Kexing Xi[1*], Youbo Wu[2*], Junfeng Xie[3], Baolong Ye[3], Cailiang Zhong[3]

[1]Cancer Center, Beijing Tsinghua Changgung Hospital, School of Clinical Medicine, Tsinghua University, No. 168 Litang Road, Changping District, Beijing 102218, The People's Republic of China; [2]Medical College of Jiaying University, Meizhou 514031, Guangdong, The People's Republic of China; [3]Department of Gastrointestinal Hernia Surgery, Ganzhou Hospital-Nanfang Hospital, Southern Medical University, Ganzhou 341000, Jiangxi, The People's Republic of China. [*]Equal contributors.

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Abstract: Hepatocellular carcinoma (HCC) is one of the most prevalent malignancies, with surgery being one of its primary treatment modalities. The common sites of distant metastasis primarily include the lungs and bones. A 69-year-old male patient reported bowel movement onset accompanied by dizziness and occasional chest tightness two months prior to consultation. Upon completion of the Computed Tomography (CT) examination, the patient's scan revealed a heterogeneous mass shadow in the descending segment of the duodenum, measuring approximately 9.3 * 7.8 * 9.0 cm in size. Enhanced scanning demonstrated uneven enhancement, leading to the consideration of a malignant neoplastic lesion. The surrounding fatty spaces were indistinct, with multiple enlarged lymph nodes visible, suggestive of perineural lymph node metastasis. Due to the massive size of the tumor, its nature could not be definitively ascertained preoperatively, prompting the patient to undergo surgical resection. Postoperative pathological analysis indicated duodenal metastasis of hepatocellular carcinoma. The metastasis of hepatocellular carcinoma to the duodenum is exceedingly rare, especially in a patient seven years post-surgery from liver cancer. The treatment of duodenal metastasis from hepatic carcinoma is complex and necessitates individualized management strategies tailored to diverse clinical scenarios.

Keywords: Hepatocellular carcinoma, duodenum, metastasis, treatment, case report

Introduction

In china, the number of deaths from primary liver cancer reached more than 310,000 per year, ranking second in both the number of deaths and mortality rate among all cancers [1, 2]. The most common sites of distant metastasis for hepatocellular carcinoma (HCC) are the lungs, bones and adrenal glands [3]. In patients diagnosed with HCC, gastrointestinal involvements, including the duodenum, stomach and colon are infrequent [4-6]. In particular, duodenal metastases are rare in HCC patients treated with surgery.

Duodenal tumors encompass a spectrum of benign and malignant neoplasms. Duodenal tumors account for approximately 1% to 2% of all gastrointestinal tumors [7], with a lower incidence compared to gastric and colonic cancers. Nevertheless, advancements in diagnostic techniques, such as high-resolution endoscopy and imaging modalities, have led to an increase in their detection rates. Herein, we report a patient with a huge duodenal tumor which developed from duodenal metastasis seven years after undergoing radical resection for hepatocellular carcinoma.

Case presentation

The patient was a 69-year-old male who reported the onset of bowel movements accompanied by dizziness and occasional chest tightness two months prior to consultation. Upon admission to our hospital, the patient underwent a Computed Tomography (CT) scan. Upon completion of the CT examination, the patient's scan revealed a heterogeneous mass shadow in the descending segment of the duodenum, measuring approximately 9.3 * 7.8 * 9.0 cm in size. Enhanced scanning demonstrated uneven

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Figure 1. Abdominal CT scan revealed a heterogeneous mass shadow in the descending segment of the duodenum.

enhancement, leading to the consideration of a malignant neoplastic lesion. The surrounding fatty spaces were indistinct, with multiple enlarged lymph nodes visible, suggestive of perineural lymph node metastasis (**Figure 1**). Endoscopic examination revealed a heterogeneous hypoechoic mass located at the posterior wall of the duodenal bulb, protruding both intraluminally and extraluminally, with a greater proportion extending outside the lumen. The preoperative biopsy pathological findings suggested relatively uniform cells with round nuclei, fine chromatin, and eosinophilic cytoplasm, with a neoplastic lesion not yet ruled out. No significant abnormalities were observed during the physical examination.

The patient was initially diagnosed with primary liver cancer seven years ago. Imaging findings indicated a tumor in the posterior segment of the right hepatic lobe, measuring approximately 3 * 3 cm. The patient subsequently underwent laparoscopic resection of the posterior segment of the right liver. Postoperative pathology confirmed hepatocellular carcinoma, staged as stage I. After surgery, the patient underwent regular follow-up examinations: every three months within the first two years, every six months from the third to the fifth year, and annually after five years.

Based on a comprehensive assessment of the patient's preoperative examinations, a preliminary consideration was given to the possibility of duodenal stromal tumor. After thorough examination, the patient underwent surgical intervention. During surgery, a tumor of approximately 9 * 7 cm in size was observed proximal to the gastric antrum within the duodenum. A complete excision of this tumor was successfully performed, subsequently followed by a meticulous gastrojejunostomy to restore continuity of the gastrointestinal tract, with no postoperative complications.

Macroscopic examination of the resected specimen revealed a tumor measuring approximately 9 * 7 * 8 cm, with a solid and grayish-white cut surface, and a well-defined margin. Histologically, the nuclei of the tumor cells were round or polygonal, with visible nucleoli and mitotic figures. The cytoplasm was acidophilic or clear, and tumor giant cells could be seen in some areas. The arrangement was in a trabecular or reticulated pattern, interspersed with abundant sinusoids. There was also a significant amount of necrosis and calcification (**Figures 2** and **3**).

Immunohistochemical analysis demonstrated CD117 (-), CK (partial positive), DOG (-), EMA (+), HER (+), Ki67 (75% positive), Desmin (-), Ck19 (partial positive), Vim (-), Gly-3 (+), Hepatocyte (-), CK7 (-), CK20 (-), CDX-2 (-), CD34 (+), MSH2 (+), MSH6 (+), MLH1 (+), and PMS2 (+). The final pathological diagnosis confirmed metastatic hepatocellular carcinoma of the duodenum.

Upon discharge from the hospital, the patient's symptoms exhibited marked improvement, and their overall condition was favorable. The patient subsequently attended the Medical Oncology department for follow-up treatment, which consisted of a combination of targeted therapy and immunotherapy, along with regular monitoring.

Discussion

HCC is characterized by the uncontrolled proliferation of hepatic cells, leading to the formation of a tumorous mass that can infiltrate surrounding tissues and potentially metastasize to other organs. The common sites of distant metastasis in HCC have been well-documented in the literature. The lungs, bones, and adrenal glands are among the most frequently affected distant sites [3, 8, 9]. The propensity for spread to specific organs is influenced by factors such as the tumor's size, vascular invasion, and the patient's overall health status.

Duodenal tumors are categorized into two primary groups: benign and malignant. Benign tu-

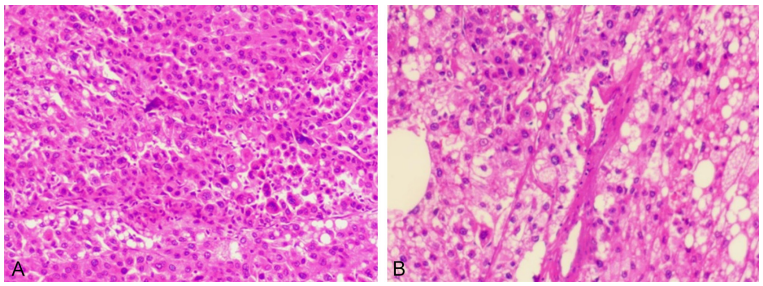

Figure 2. The nuclei of the tumor cells are round or polygonal, with visible nucleoli and mitotic figures (hematoxylin and eosin). A, B. Magnification ×400.

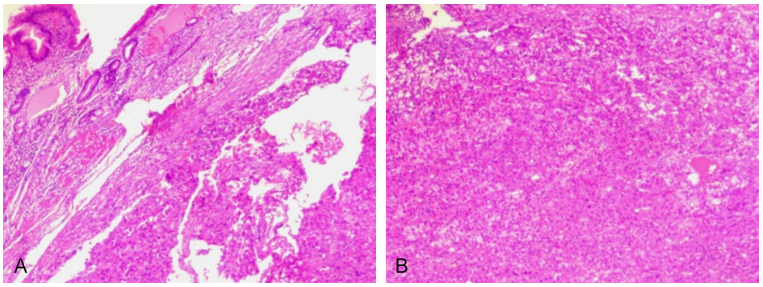

Figure 3. The arrangement is in a trabecular or reticulated pattern, interspersed with abundant sinusoids (hematoxylin and eosin). A, B. Magnification ×100.

mors encompass adenomas, among others, whereas malignant tumors primarily consist of duodenal carcinomas, metastatic carcinomas, stromal tumors, and so forth. Gastrointestinal stromal tumors (GISTs) constitute the most prevalent form of mesenchymal malignancies that originate within the gastrointestinal tract. 3-5% GISTs occur in the duodenum [10]. Preoperative examinations for this case suggested a high possibility of stromal tumor. However, postoperative pathological findings indicated a duodenal metastasis of hepatocellular carcinoma. The metastasis of liver cancer to the duodenum is extremely rare. This underscores the significance of surgery for duodenal tumors, as it not only enables the resection of the lesion but also contributes to definitive diagnosis.

The subsequent probability of recurrence and metastasis in liver cancer patients diminishes significantly if no such events occur within the first five years post-surgery. Nonetheless, in this early-stage case, the onset of liver cancer metastasis was observed more than seven years after the surgery, emphasizing the necessity for clinicians to maintain regular follow-ups even beyond the five-year mark. Such a practice facilitates the timely detection of recurrent or metastatic lesions, enabling prompt interventions and ultimately improving patient outcomes.

Clinically, the symptoms of duodenal tumors vary depending on the tumor's location, nature, size, and growth rate. During the course of tumor growth, many patients remain asymptomatic. For example, tumors located within the abdominal cavity often do not produce symptoms until they have attained a significant size, at which point they may manifest as digestive or abdominal discomfort. In more severe instances, complications such as intestinal obstruction, ischemia, perforation, or hemorrhage may occur. The primary complaint reported by the patient in this particular case was hemorrhage.

CT and endoscopy are the primary diagnostic tools for the duodenum, with gastroscopy aiding in the delineation of tumor location and nature. CT scanning facilitates the assessment of the tumor's relationship with surrounding tissues and organs. On CT scans, metastatic hepatocellular carcinoma to the duodenum typically manifests as a heterogeneously enhancing mass. Immunohistochemistry (IHC) assays show positivity for CD34 and Gly-3 in the duodenal metastasis of hepatocellular carcinoma; while it was negative for CK20 and CDX-2.

Differential diagnosis of duodenal metastasis of hepatocellular carcinoma includes tumors such as duodenal carcinoma, GIST, gastrointestinal schwannoma, gastrointestinal leiomyoma. Distinguishing duodenal metastasis of hepatocellular carcinoma from these tumors can be aided by the nuclear positivity of CD34, Gly-3, as well as the negative of CK20 and CDX-2 in duodenal metastasis of hepatocellular carcinoma tumor cells and the CT/ Magnetic Resonance Imaging (MRI) scan images.

The management of duodenal metastasis of hepatocellular carcinoma is complex and relies on personalized therapeutic approaches tai-

lored to the anatomic location and size of the tumor. Various treatment modalities exist, including surgery, radiotherapy, chemotherapy, targeted therapy, among others. For resectable tumors accompanied by symptoms such as obstruction and bleeding, surgical resection is the first choice, as it serves both therapeutic and diagnostic purposes, followed by medical treatment postoperatively. In contrast, for initially unresectable lesions, chemotherapy and other treatments are indicated based on the underlying disease condition. In our case, the patient presented with a massive tumor accompanied by gastrointestinal bleeding, with preoperative endoscopy failing to definitively ascertain the nature of the tumor. Consequently, the patient underwent surgical resection, addressing multiple issues simultaneously.

Conclusions

To sum up, the metastasis of hepatocellular carcinoma to the duodenum is exceedingly rare, especially in a patient seven years postsurgery for liver cancer. The treatment of duodenal metastasis from hepatic carcinoma is complex and necessitates individualized management strategies tailored to diverse clinical scenarios.

Disclosure of conflict of interest

None.

Address correspondence to: Cailiang Zhong, Department of Gastrointestinal Hernia Surgery, Ganzhou Hospital-Nanfang Hospital, Southern Medical University, Ganzhou 341000, Jiangxi, The People's Republic of China. E-mail: zhongcailiang@mail.gzsrmyy.com

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