Duodenal Adenocarcinoma with Liver Metastasis and Elevated Serum Alpha-fetoprotein

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We report a 72-year-old woman with metastatic liver tumor presenting with elevated alpha-fetoprotein (AFP) due to duodenal adenocarcinoma. This patient was admitted because of melena for 4 days. Upper gastrointestinal endoscopic examination showed an ulcerative tumor in the first and second portion of the duodenum. Endoscopic biopsy of the duodenal tumor revealed a moderately differentiated adenocarcinoma. Computed tomography of the abdomen demonstrated a tumor in the duodenum and multiple tumor lesions in the liver. The laboratory data showed that the serum AFP level was 3973 ng/mL (reference range, < 20 ng/mL). A sonographic-guided liver biopsy was performed which revealed a metastatic adenocarcinoma. We found that the highly elevated serum AFP might have originated from the duodenal cancer with liver metastasis. **(Mid Taiwan J Med 2003;8:169-73)**

Key words

alpha-fetoprotein, duodenal adenocarcinoma, liver metastasis

INTRODUCTION

Elevated serum alpha-fetoprotein (AFP) has been found to be a useful tumor marker for detecting primary hepatocellular carcinoma (HCC) and yolk sac tumors [1]. Raised serum AFP levels have been infrequently reported in patients with carcinoma of the gastrointestinal tract [2-4]. However, AFP-producing duodenal adenocarcinoma is rare. In an extensive review of the reports on Medline, there were only three reported cases in the literature [5,6]. We herein report a woman with a metastatic liver tumor due to a duodenal adenocarcinoma presenting with an abnormally high serum AFP concentration.

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CASE REPORT

A 72-year-old woman with hypertension and cerebral infarction, was admitted to our hospital because of melena for 4 days. On admission, body temperature was 37°C; blood pressure, 120/90 mmHg; pulse, 84 beats per minute and respiratory rate, 24 breaths per minute. Physical examination demonstrated a stuporous consciousness, pale conjunctiva, anicteric sclera, a soft but distended abdomen, and decreased bowel sounds. There was neither a palpable abdominal mass nor lymphadenopathy. The results of laboratory studies were as follows: hemoglobin, 5.4 gm/dL; hematocrit, 18.9%; platelet count, 132,000/μL; white blood cell count, 12,240/μL, with 85.4% neutrophilic segment; blood sugar, 187 mg/dL; blood urea nitrogen, 33.2 mg/dL (reference range, 6-23); creatinine, 0.83 mg/dL (reference, 0.5-1.5); serum glutamic-pyruvate transaminase, 11 U/L

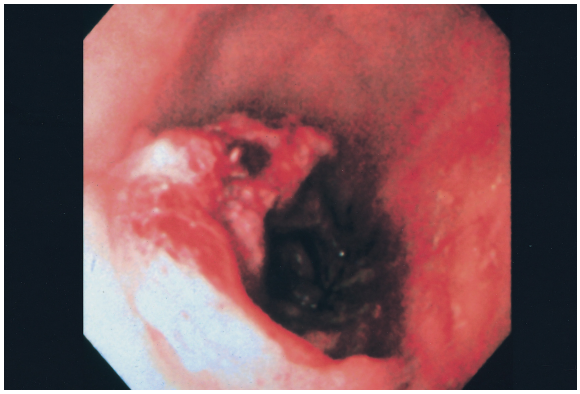

Fig. 1. Upper gastrointestinal endoscopy. An ulcerative tumor extended from the first portion to the second portion of duodenum.

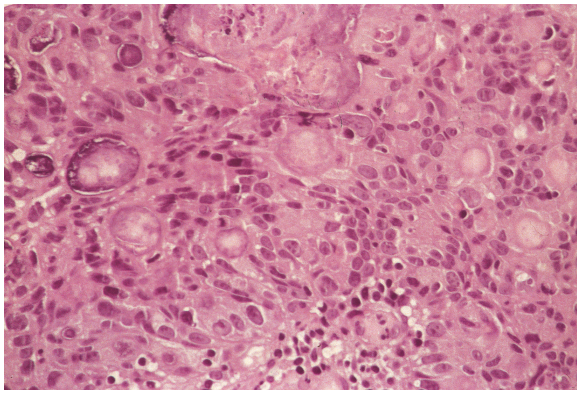

Fig. 2. Histological photomicrography of the duodenal tumor predominantly showed a moderately differentiated adenocarcinoma (H & E, ×400).

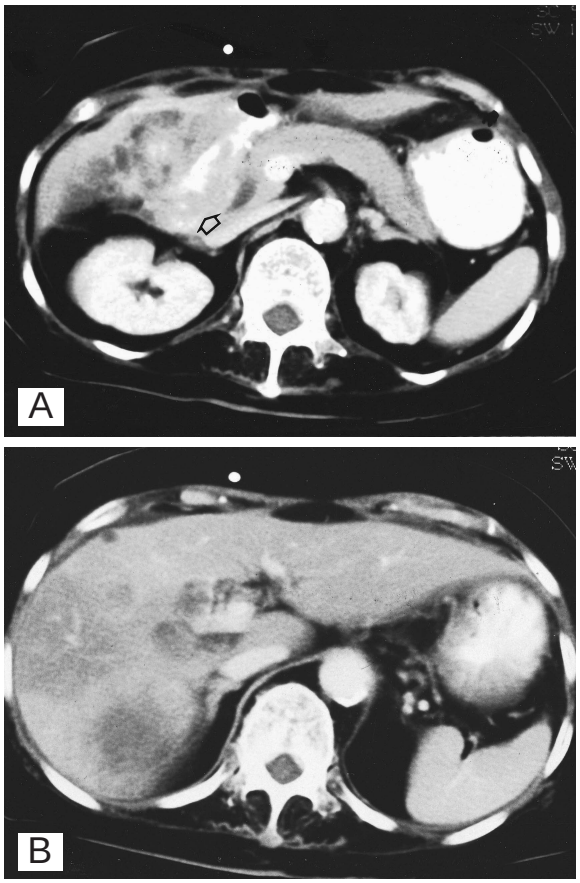

Fig. 3. Computed tomographic scan of abdomen. A: A large tumor (arrow) in the duodenum. B: Multiple tumor lesions in the liver.

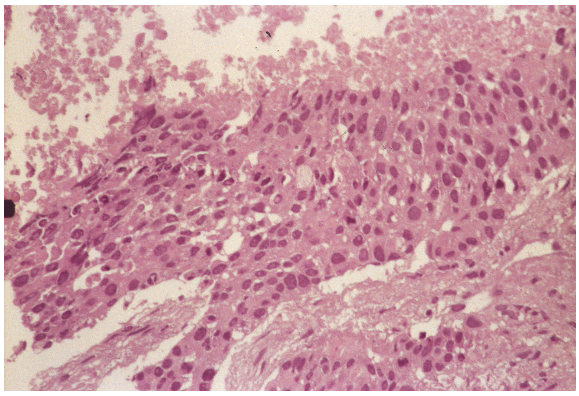

Fig. 4. Photomicrography of the hepatic tumor revealed the same histologic pattern as the duodenal adenocarcinoma (H & E, ×200).

(reference, < 29); serum glutamic-oxaloacetic transaminase, 88 U/L (reference, 7-31); total bilirubin, 1.84 mg/dL (reference, 0.2-1.0); direct bilirubin, 0.53 mg/dL (reference, < 0.2); and alkaline phosphatase, 178 U/L (reference, 42-121). There was no viral hepatitis B or C infection. An upper gastrointestinal endoscopy showed an ulcerative tumor extending from the duodenal bulb to the second portion of the duodenum (Fig. 1). An endoscopic biopsy was performed and the pathological results showed a moderately differentiated adenocarcinoma (Fig. 2). Computed tomography of the abdomen demonstrated multiple space-occupying lesions in both lobes of the liver, and a tumor in the duodenum with invasion to the liver and the colon (Fig. 3). Multiple small lymph nodes were also noted around the tumor. The serum AFP concentration was 3973 ng/mL (reference

range, < 20), and the serum carcinoembryonic antigen concentration was normal. Repeat examination of the serum AFP still revealed a level 200 times greater than normal. Subsequent sonographic-guided biopsy of the hepatic tumor was performed. Microscopically, the hepatic tumor showed the same histology as the duodenal adenocarcinoma (Fig. 4). However, the immunohistochemical study indicated that AFP-positive cells were only weakly detectable in the duodenal tumor and metastatic hepatic tumor.

The patient died of urosepsis and multiple organ failure on the 36th day of hospitalization.

DISCUSSION

Alpha-fetoprotein (AFP)-producing cancers, which are characterized by elevated serum AFP levels and test results positive for AFP in the lesion, have been reported in patients with cancers of stomach, colon, rectum, bile duct, pancreas, esophagus and gallbladder [3,4,7-10]. It has also been reported that patients with liver metastasis had higher serum AFP levels than those without liver metastasis [4,11]. However, AFP-producing duodenal cancer is extremely rare. Only three reported cases in Japan were found after an extensive search on Medline [5,6]. In our patient, liver metastasis was associated with concomitant colon invasion, which suggested lymph node metastasis. The clinical features were consistent with previous reports of AFP-producing cancers of the gastrointestinal tract with liver metastasis.

There has been an increase in the number of reports on AFP-producing gastric cancers. The incidence is reported to be 1.3% to 15% of all gastric cancers [3,12,13]. Liver metastasis, which makes this disease so different from other types of gastric cancers, has been reported to occur at an incidence as high as 73.7% [5]. Because of the frequent development of synchronous and metachronous liver metastasis, the prognoses of patients with AFP-producing tumors are extremely poor and all patients reported in one study died within 2 years of diagnosis [14].

The main theory to explain the increase in AFP was based on the morphological similarity between AFP-producing cancers and the other tumors that produce AFP, especially HCC and yolk sac tumors [15]. The stomach, duodenum and liver are all derived from the foregut which is supposed to be in direct continuity with the yolk sac during the primitive stage of development [16]. It has been postulated that AFP production by AFP-producing cancers can be explained by hepatoid differentiation or retrodifferentiation of tumor cells into fetal cells [17].

The pathological diagnosis of AFP-producing cancers is made according to the results of immunohistochemical staining for AFP. However, AFP is not always detectable in primary and metastatic tumors as reported in a case of a relapsing gallbladder carcinoma with a high serum level of AFP [10]. The absence of AFP staining has been suggested to be associated with fewer differentiating characteristics on histopathological examination. AFP staining failed to demonstrate strongly positive stained tumor cells in either the primary or metastatic tumors in our patient. In addition to the possibility of fewer differentiating characteristics, the specimen obtained from biopsy on the duodenal or metastatic liver tumors in our patient may not have contained the AFP-positive portion of the tumor. Of course, the results of immunohistochemical staining or histological techniques that are negative for AFP cannot be ruled out completely.

Therefore, we suggest that additional investigation should be carried out to evaluate patients with duodenal cancer and high serum AFP levels.

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十二指腸腺癌合併肝臟轉移及血清α胎兒蛋白升高

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我們報告一個十二指腸腺癌合併肝臟轉移伴隨α胎兒蛋白血清值昇高的病例。這位72歲的女性病人因爲連續四天解黑便而住院。上消化道內視鏡檢查發現十二指腸有一個表面有潰瘍的腫瘤。病理切片報告爲中度分化的腺癌。腹部的電腦斷層攝影除了顯示十二指腸的腫瘤外，亦在肝臟發現多個腫瘤性病灶。病人的α胎兒蛋白血清值高達3973 ng/mL（正常值小於20 ng/mL）。此病人接受超音波導引下的肝臟切片檢查，結果肝臟腫瘤的病理切片報告爲轉移性的腺癌。我們發現此一升高的血清α胎兒蛋白應該是由製造α胎兒蛋白的十二指腸腺癌所產生。（**中台灣醫誌 2003;8:169-73**）

關鍵詞

α胎兒蛋白，十二指腸腺癌，肝臟轉移

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