

Case Report

Pyloric canal carcinoid of the stomach: a case report

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Abstract: Gastric neuroendocrine tumors are increasing in incidence, possibly because of increased detection and better surveillance. Gastric carcinoid is a kind of rare, low-grade, slow growth malignant lesion. Here we present a report of a patient for a major complaint of melena lasting 4 days with a giant adenoma-like new growth at the lateral posterior wall of the gastric pyloric canal which was diagnosed as submucosal carcinoid after surgical resection.

Keywords: Gastric carcinoid, bleeding, surgical resection

Introduction

Gastric carcinoid is a kind of rare, low-grade, slow growth malignant lesion. Gastric carcinoid is one type of the gastric neuroendocrine tumors. With the progress of medical technology, the carcinoid can be found more and more easily in the digestive tract, which accounts for 1-3% of gastric cancer. Gastric carcinoid often leads to abdominal distension, abdominal pain, and even bloody symptoms in patients. Here we present a report of a patient with melena, abdominal pain and discomfort who was identified a giant adenoma-like new growth at the lateral posterior wall of the gastric pyloric canal. Severe bleeding happened after excision of the lesion and urgent surgery was performed to stop the bleeding. Pathological examination and immunohistochemistry confirmed a diagnosis of submucosal carcinoid. Endoscopic resection and surgical excision are currently the main methods for the treatment of big carcinoid. Type I kind of cancer can be treated with endoscopic resection, while type II and type III are mainly treated by surgical resection. Operation method and excision scope are selected according to the site, diameter of the tumor, vascular infiltration degree, etc. The prognosis of carcinoid depends mainly on tumor differentiation level and stage.

Case report

A 73-year-old female was admitted to the hospital for a major complaint of melena lasting 4 days. 4 days before admission, patients intermittently started passing small amount of melena for a total of 5 times, in a total of ~300 g, without any obvious precipitating events. The melena was accompanied by vague abdominal pain and discomfort. She had no vomiting, dizziness, or fatigue. She also has a past history of type 2 diabetes mellitus and hypertension for more than ten years. Physical examination upon admission found vital signs within normal limits (body temperature 37°C, pulse 74 beats/min, respiratory rate 16 breaths/min, and blood pressure 130/70 mmHg). The patient was alert and appeared to have mild anemia. The swollen superficial lymph nodes were not palpated. The abdomen was soft and flat, with mild upper abdominal discomfort upon palpation, no tenderness or rebound tenderness and no palpable abnormal masses. Workup found blood cell analysis as follows: WBC $5.1 \times 10^9/L$, N% 63.6%, Hb 86 g/L, HCV 0.131 L/L, PLT $88 \times 10^9/L$. Fecal occult blood test was weakly positive.

The patient received initial hemostatic rehydration and acid suppression treatment upon admission. Upper gastrointestinal endoscopy

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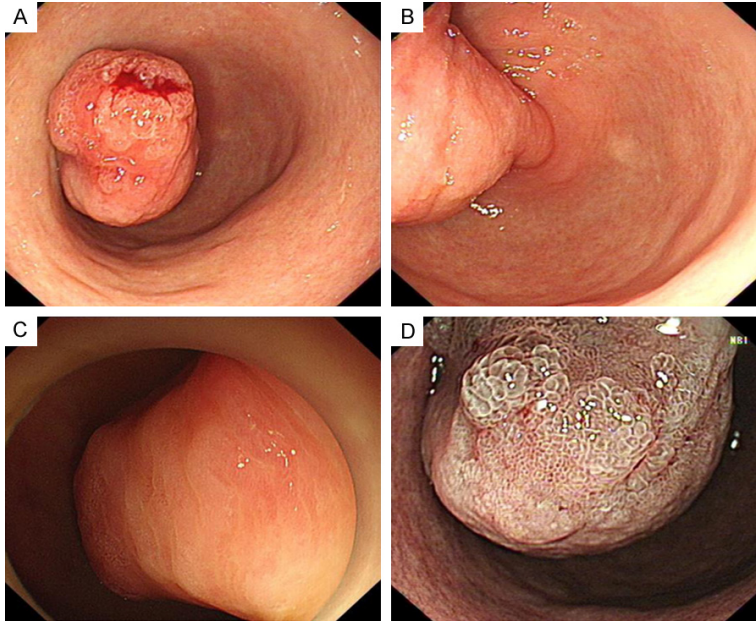


Figure 1. Endoscopic image of the lesion. A. The lateral posterior wall of the gastric pyloric canal at the large curved side next to the duodenal bulb showed a giant adenoma-like growth, which inverted into the duodenal bulb. A snare was used to pull the mass into the stomach cavity for further observation, showing surface erosive bleeding of the mass. B. The base of the lesion originated from the lateral posterior wall of the gastric pyloric canal on the large curved side next to the duodenal bulb. C. The base of the lesion originated from the lateral posterior wall of the gastric pyloric canal on the large curved side next to the duodenal bulb. D. The surface of the lesion under NBI shows gland enlargement and fusion as papillary changes. Local central depression is similar to the intestine Pit-Pattern typing IIIIL type.

showed a giant adenoma-like new growth with a size of about 20 mm × 30 mm at the lateral posterior wall of the gastric pyloric canal on the large curved side next to the duodenal bulb, upside down in the duodenal bulb. When stretched into the stomach using a snare, surface mucosal erosion and bleeding were observed. Local tissue biopsy for pathology showed hyperplastic polyps (**Figure 1**). It was thus diagnosed as Brunner's gland adenoma. Because of the enormous size of the polyp, it may occlude the duodenal lumen completely. We suggested surgical resection as a better option, but the patient preferred to undertake minimally invasive endoscopic resection.

Three days later, the lesion was resected via EMR surgery. Considering that this was a long pedicle lesion, a snare was used to directly entangle the base followed by coagulation electro-tomy. After excision of the lesion, an artery with blood spurting out was observed. Repeated washes and local compression using a

transparent cover were used, and we found that the root of the lesion continued to turn into the lateral segment of the duodenal bulb. The field of vision could not be exposed, and repeated attempts failed to stop bleeding using electric coagulation hemostasis (**Figure 2**). After thorough consideration, we gave up further endoscopic hemostasis, and surgery was performed to stop the bleeding. Surgical hemostatic was performed and the procedure was as follows: after successful anesthesia, a 14 cm median abdominal incision was cut, layer by layer into the abdomen. Exploration of the abdominal cavity revealed no significant bloody fluid. Further exploration of the stomach and duodenum showed obvious swelling of the stomach without gastric surface serosa perforation, or bleeding. A longitudinal gastric wall incision was made in the vicinity of the pylorus. After removal of a total volume

of 2000 ml of the blood and blood clots from the gastric cavity, the stomach cavity was exposed. An ulcer around 2 cm in diameter was located in the pyloric canal wall next to the duodenal bulb, at the residual end of the endoscopic resection of the tumor. Active arterial bleeding from the ulcer surface was observed. The base of the residual mass was picked and sutured for hemostasis. The remaining stomach wall was checked and there was no significant bleeding in the remaining stomach or duodenum and no pyloric stenosis.

Biopsy was taken from the endoscopic resected mass from the bottom of the stomach for pathological analysis. Pathological examination of the removed mass showed a nodular mass 3 × 2 × 1.5 cm in size with a gray or gray-red cross-section. The pathological tissue specimen was very tough. The diagnosis was submucosal carcinoid from the gastric pyloric canal next to the duodenal bulb, about 2 cm in diameter, with tumor thrombus observable in

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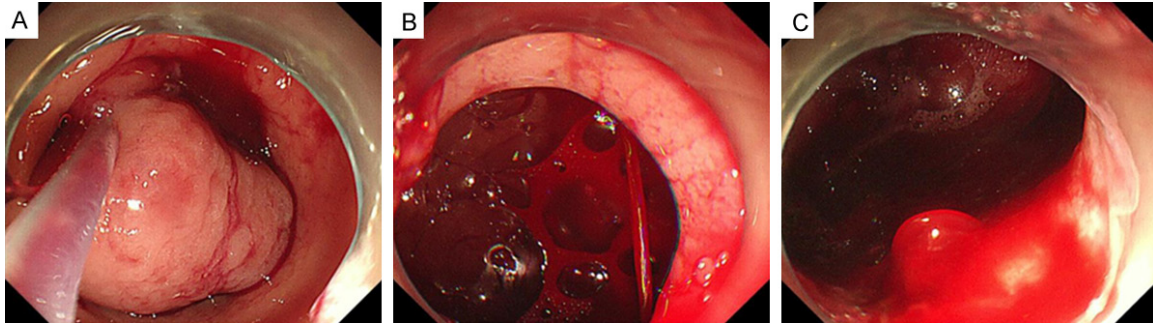


Figure 2. Severe bleeding after the endoscopic resection. A. The use of snare to directly entangle the base of the lesion to resect the lesion through the electric coagulation and the excision. B. Local arterial bleeding after the lesion excision. C. Local arterial bleeding after the lesion excision; repeated endoscopic hemostasis failed.

the vasculature. Lateral resection margin and basal margin showed no cancer residue. Immunohistochemistry showed CKpan (+), CgA (++) , Syn (++) , P53 (-), CD56 (++) , D2-40 (+) with no tumor thrombus in the lymphatic vessels, and CD31 (+) with intravascular tumor emboli. Combined with HE section, the final diagnosis was considered gastric helicobacter tube submucosal carcinoid, with thrombus in the blood microvasculars. There was no residual cancer on the lateral side of the margin of the resection or on the base of the margin (**Figure 3**).

Due to postoperative tumor thrombus in the vasculature, we suggested that patient undergo further additional gastrectomy, but her family refused. The follow-up lasted for at least 6 months with no recurrence.

Discussion

Gastric carcinoid is a rare, low-grade, slow growth malignant lesion, a neuroendocrine tumor. It has the ability to metastasize and recur. It originates from the argyrophilic cells, also known as Kulchitsky cells, of the fore-gut mucosa of the embryonic period. With the progress of medical technology, the carcinoid can be found more and more easily in the digestive tract, and it accounts for 1-3% of gastrointestinal carcinoid [1, 2]. Endoscopic observation of lesions showed mostly polypoid or hemispheric submucosal lesion or ulcer infiltration, mucosal surface edema, or smooth surfaces. Clinical manifestations of patients with carcinoids tend to be mild, mainly due to the carcinoid producing 5-HT and other bioactive factors, which causes vasospasm, leading to bloating, abdominal pain, and bloody stool. Currently gastric

carcinoid is classified into three types as defined by Pinchot [3]: type I: associated with type A chronic atrophic gastritis or associated with pernicious anemia, accounting for 70% to 80%, with a diameter <2 cm, and little vascular metastasis; type II: complicated with Zollinger-Ellison syndrome or manifesting as multiple endocrine tumors, accounting for 5%, with a diameter greater than 2 cm, and higher grade; type III: sporadic carcinoid, accounting for 15-20%, tumors without gastrin oversecretion can be G1, G2, or G3. In this case, the patient had type III carcinoid, which should be differentially diagnosed among stomach polyps, stromal tumors, and Borrmann III type of gastric cancer. The gold standard for diagnosing gastric carcinoid is histopathology. The pathological findings showed gastric carcinoid cells to be basically the same in size, arranged in nests or cords, and positive for argyrophilic staining [4].

Endoscopic resection and surgical resection are currently the main means of treatment of carcinoid. Type I carcinoid can be removed by endoscopic resection, while type II and III are removed by surgical resection. Surgical methods and resection range are determined according to the tumor site, diameter, vascular infiltration, sporadic or multiple lesions. The recovery of carcinoid depends mainly on the tumor differentiation and staging. Landry proposed gastric carcinoid TNM staging system [5]. It is a relatively accurate means of determining the prognosis of patients with gastric carcinoid. Postoperative adjuvant chemotherapy was not found to be beneficial [6].

For gastric carcinoids, we summarize the following experience in diagnosis and treatment:

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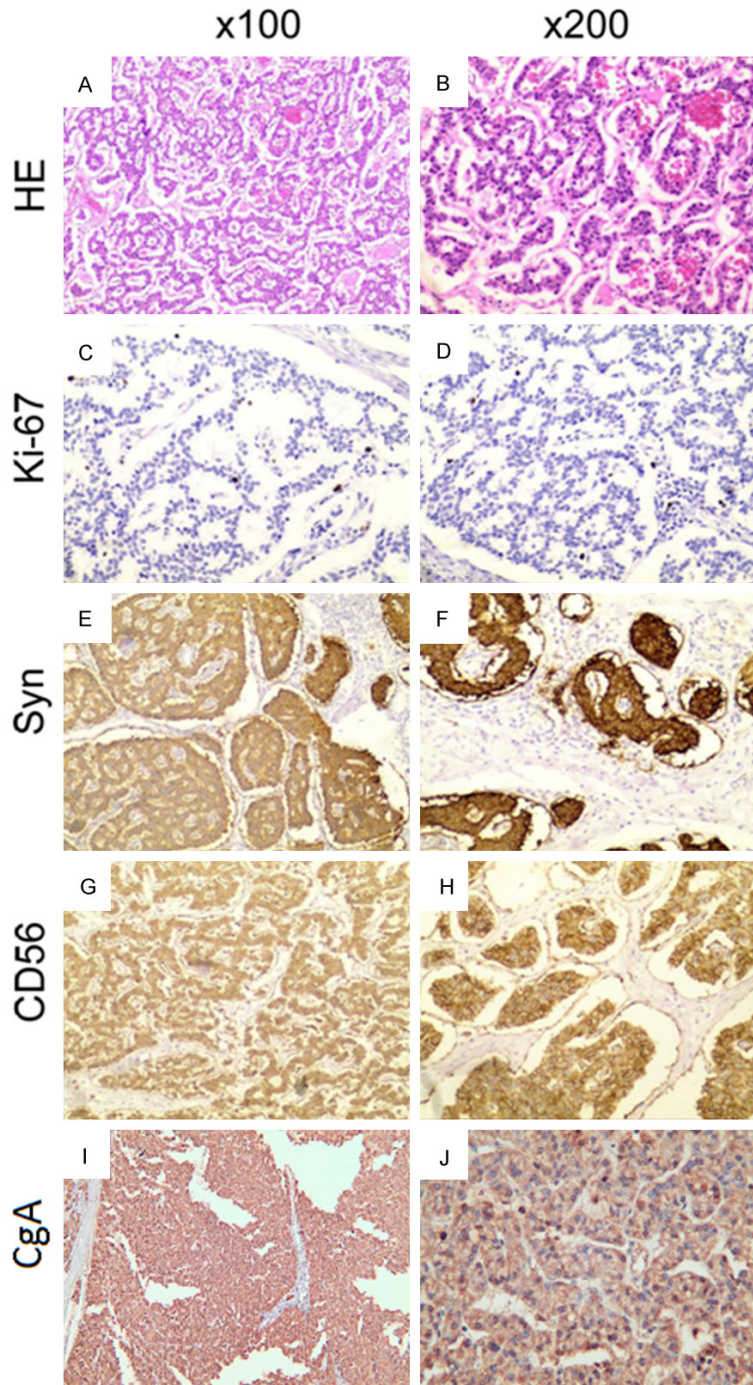


Figure 3. Pathological examination and immunohistochemistry staining. A. Carcinoid tumor cells are basically the same size, arranged in nests or cords. HE 100 \times . B. Carcinoid tumor cells are basically the same size, arranged in nests or cords. HE 200 \times . C. Immunohistochemistry staining of Ki-67, the positive rate of Ki-67 is 1%, 100 \times . D. Immunohistochemistry staining of Ki-67, the positive rate of Ki-67 is 1%, 200 \times . E. Immunohistochemistry suggests Syn (++). 100 \times . F. Immunohistochemistry suggests Syn (++). 200 \times . G. Immunohistochemistry suggests CD56 (++). 100 \times . H. Immunohistochemistry suggests CD56 (++). 200 \times . I. Immunohistochemistry suggests CgA (++). 100 \times . J. Immunohistochemistry suggests CgA (++). 200 \times .

(1) The importance of preoperative ultrasound endoscopy (EUS) [7]. The carcinoid originated from the argyrophilic cells in the base of the mucosal glands in the deep layer of the mucosa, and it may grow toward the surface of the serosa or mucosa. In this way, EUS can be used to estimate the number of layers in the local tumor, the depth of tumor invasion, or vascular invasion, submucosal blood vessels, to prevent the occurrence of an accidental section of artery and bleeding during endoscopic mucosal resection (EMR)/endoscopic submucosal dissection (ESD) surgery. (2) For endoscopic treatment, ligation combined with ESD/EMR can significantly improve the complete resection rate of the lesion. The indications for endoscopic treatment includes a diameter <1 cm. If excision of pathology specimens has negative margins and negative vessels metastasis, no further surgery is needed [8]. (3) Immunohistochemistry has important significance in the diagnosis and assessment of gastric carcinoid. The most commonly used indicators include synaptophysin (syn), chromogranin A (CgA), neuron-specific enolase (NSE), CKP, and CD56. The first three indicators, if positive, have the most value in the diagnosis of carcinoids. (4) Special attention should be directed to gastric carcinoids. Most gastric carcinoids are found at a late stage, after lymphatic metastasis, and the patient's prognosis is poor, which is not the case with intestinal carcinoids. Therefore, it is of particular importance to regularly follow up

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patients with postoperative biochemical indicators (CgA, Syn). (5) Endoscopy, B ultrasound, computed tomography (CT)/magnetic resonance imaging (MRI), and other related tests.

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Disclosure of conflict of interest

None.

Abbreviations

EUS, ultrasound endoscopy; EMR, endoscopic mucosal resection; ESD, endoscopic submucosal dissection; syn, synaptophysin; CgA, chromogranin A; CT, computed tomography; MRI, magnetic resonance imaging.

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