Research Article

Cancer Control
Volume 32: 1–11

DOI: 10.1177/10732748251319486
journals.sagepub.com/home/ccx
Sage

Clinical Characteristics and Pathological Features of "Crawling-type" Early Gastric Carcinoma: A Retrospective Series of Eight Cases

Kehan Li, MM[1], Xiaofeng Zhuang, MM[2], Bingyue Yao, MM[1], Li Zhang, MM[3], Qinwei Xu, MM[1], Tao Chen, MD[1], and Jia Cao, MD[1]

Abstract

Background: "Crawling-type" early gastric carcinoma (EGC) is a rare subtype of gastric cancer (GC) that is challenging to diagnose at an early stage due to its low-grade nuclear heterogeneity and morphology that mimics intestinal metaplasia. This study aimed to explore the clinical characteristics and pathological features of patients with crawling-type EGC.

Methods: This case series study retrospectively included patients with crawling-type EGC who underwent endoscopic submucosal dissection (ESD) or gastrectomy at the East Hospital Affiliated to Tongji University between January 2019 and March 2022.

Results: 8 patients (mean age 63.5 ± 7.8 years) were included: 4 underwent ESD, and 4 underwent partial gastrectomy. In 4 patients, the tumors were primarily located in the gastric cardia and the basal gland area of the upper stomach, while the other 4 patients had tumors in the antral region. Preoperative gastroscopy revealed atrophic gastritis and intestinal metaplasia in all patients. The lesions were generally flat in morphology. Submucosal infiltration was found in only one case. Signet ring cells were present in the tumors of 5 patients. The mucinous type was observed in 7 patients. Seven tumors were of the gastrointestinal mixed type. Curative resection was achieved in all patients. No recurrence events were observed in any patient at 1 year after surgery.

Conclusions: The crawling-type EGC may exhibit distinct clinical characteristics and pathological features compared with classical GC. Curative resection was achieved in all patients. The short-term prognosis of surgical treatment may be favorable.

Keywords

early gastric adenocarcinoma, crawling-type, endoscopic submucosal dissection, gastrectomy, pathology, case series

Received May 20, 2024. Received revised January 15, 2025. Accepted for publication January 20, 2025.

Introduction

Gastric cancer (GC) is a malignant neoplasm originating from the epithelium of the gastric mucosa. Although its incidence has declined in recent years, it remains one of the most common malignant tumors globally.[1] In China, GC was the third most important cancer in terms of incidence and mortality in 2022.[2] GC is a heterogeneous disease, and clinicians

[1]Endoscopy Center Department of Gastroenterology, Shanghai East Hospital, Shanghai, China
[2]Department of Gastroenterology, Suzhou Jiulong Hospital Affiliated to Shanghai Jiao Tong University, Shanghai, China
[3]Pathology Department, Shanghai East Hospital, Shanghai, China

Corresponding Author:
Jia Cao, Endoscopy Center Department of Gastroenterology, Shanghai East Hospital, Shanghai 200120, China.
Email: jia_cao@yeah.net

may occasionally overlook rare variants of GC due to their rarity.

"Crawling-type" early gastric carcinoma (EGC) is one such rare variant of GC and is characterized by irregular glandular fusion, low-grade cellular atypia, and a tendency for lateral diffusion within the mucosa.[3,4] The microscopic examination of crawling-type EGC typically reveals intestinal metaplasia cells, irregular glandular structures, occasional signet ring cells, "handshake structures," or "Whyx-type" structures.[5,6] Despite minimal atypia and extension into the area of epithelial hyperplasia, the mucosal surface of crawling-type EGC generally appears normal, posing a diagnostic challenge, particularly in small, limited biopsy specimens. Cytological features lacking distinct characteristics are often misdiagnosed as ambiguous tumor formation or reactive intestinal metaplasia, leading to an underestimation of their malignant potential.[7,8] Moreover, the boundaries of crawling-type EGC within the mucosa are frequently indistinct due to the lack of comparison with surrounding non-neoplastic mucosa,[5] making complete removal through endoscopic submucosal dissection (ESD) difficult.

Studies on the clinicopathological and molecular characteristics of crawling-type EGC are limited, complicating the accurate diagnosis of this condition.[9-11] In addition, there has been insufficient focus on the prognosis after surgical intervention. Therefore, this study aimed to report the clinical characteristics, diagnostic methods, and short-term prognosis of patients with crawling-type EGC after ESD or gastrectomy.

Material and Methods

This case series study retrospectively included consecutive patients diagnosed with crawling-type EGC who underwent ESD or gastrectomy at the East Hospital Affiliated to Tongji University between January 2019 and March 2022. The inclusion criteria were (1) patients diagnosed with crawling-type EGC for the first time and (2) who underwent ESD or gastrectomy. The exclusion criteria were (1) received cancer treatments before surgery for crawling-type EGC or (2) incomplete clinical data. This study was approved by the Ethics Committee of the East Hospital Affiliated to Tongji University (2024YS-270), and the requirement for individual informed consent was exempted due to the retrospective nature of the study. The reporting of this study conforms to STROBE guidelines.[12]

Data Collection

Data were collected from the original patient records. All surgical specimens were examined by experienced pathologists. Variables such as preoperative and postoperative pathological results, postoperative lesion/tumor size and shape, depth of invasion, atypia, 52-week prognosis, TNM staging, and type of surgery were collected. All patients were routinely followed up at 6 and 12 months after surgery using gastroscopy to observe eventual changes in gastric and scar mucosa and using computed tomography (CT) to observe lymph nodes and nearby organs. All patient details were de-identified.

Statistical Analysis

Only descriptive analysis was performed. Categorical data were expressed as n (%).

Results

Eight patients (5 males and 3 females) were included in this study. The mean age was 63.5 ± 7.8 years. The tumors were primarily localized in the gastric cardia and epigastric fundus gland regions in 4 patients (Tables 1–3), while the remaining 4 patients had tumors in the gastric antrum. Preoperative pathological biopsies revealed one patient with crawling-type carcinoma, 3 with high-grade intraepithelial neoplasia, and 4 with high-grade intraepithelial tumor, with only one patient showing submucosal invasion. Four patients underwent ESD, and 4 underwent partial gastrectomy. Postoperative pathology classified 7 patients as gastrointestinal mixed type, with only one case being pure intestinal type. The mucinous subtype was observed in 7 patients, and signet ring cells were noted in 5 patients. Regarding gross morphology, 5 tumors were flat, 2 were concave, and one was convex. Ulcers were found in 2 patients (Table 2). Curative resection was achieved in all patients. Preoperative gastroscopy revealed atrophic gastritis and intestinal metaplasia in all 8 patients. At 6 and 12 months postoperatively, no recurrence events were observed in any patient during gastroscopy and CT examinations (Table 3).

Typical Cases

Patient 4: A 64-year-old man presented with abdominal distension and belching for more than 1 month. Gastroscopic examination revealed a light red lesion classified as 0-IIb + IIc under white light and Indigo blush dyeing endoscopy (Figure 1(A) and (B)). Magnifying narrow-band imaging showed irregular microsurface and microvascular patterns (Figure 1(C)). The preoperative pathological examination suggested chronic inflammation of gastric mucosa in the minor curvature of the gastric antrum and high-grade intraepithelial neoplasia of focal glands. The patient underwent ESD (Figure 1(D)). The postoperative pathological examination revealed highly to moderately differentiated tubular adenocarcinoma/tub2 > tub1 (in part, crawling type morphological changes as the major differentiation).

The mucinous type was classified as the gastrointestinal mixed type, and the visual classification was superficial uplift and concave type (0-IIb + IIc). The tumor size was approximately 20 mm × 11 mm under the microscope. The carcinoma tissue infiltrated into mucous lamina propria (LPM/pT1a). There was no ulcer formation (UL0). The postoperative

Table 1. Clinical Information.

#	Age, years	Sex	Medical history 1. The chief complaint of the patient upon admission 2. The patient's past medical history The patient's family history 3. The patient's physical examination findings	Laboratory tests and IHC	Pathological examination results after surgery	The results of imaging examinations (abdominal CT)	Results of endoscopy	Postoperative diagnosis
1	77	Female	1. Persistent discomfort in the suprasternal region, accompanied by acid reflux, with occasional belching for 2 years. 1 month ago, the patient. 2. Has a history of hypertension for 2 years and diabetes for 1 year. Father died of esophageal cancer, mother is deceased. 3. No fever, no significant abnormalities.	CEA 13.16 ng/mL (↑) CA-199 (−) IHC: MUC2 (+), MUC5AC (+), CD10 (+), MUC6 (+), P53 (+), HP (−), CDX2 (+), HER2 (1+), P504S (+), Ki-67 (+, 25%).	Moderately differentiated tubular adenocarcinoma, small patches of low-differentiated adenocarcinoma, and very small patches of signet ring cell carcinoma/ tub2 >> por >> sig. Some areas have low cellular atypia and marked structural atypia, showing a characteristic of "crawling-type" (pulling hands/ crawling cancer). Mucin subtype: mixed intestinal type.	No lymph node metastasis was detected.	Malignant transformation of the gastric cardia mucosa	Postoperative ESD for early gastric cancer
2	68	Male	1. Complete gastric endoscopy examination before admission 10 days ago at our hospital. 2. History of hypertension for over 30 years. 3. Deny family history of hereditary diseases.	CEA (−) CA-199 (−) IHC with CK shows scattered single-cell infiltration (not visible on HE morphology)	Moderately differentiated tubular adenocarcinoma/ tub2 (low cellular pleomorphism, crawling-type), Mucin subtype: complete intestinal type.	No lymph node metastasis was detected.	Gastroduodenal mucosal lesion, ESD procedure.	Postoperative ESD for early gastric cancer

(continued)

Table 1. (continued)

3	65	Male	1. The patient had upper gastrointestinal bleeding 2 months ago. 2. He has a history of type 2 diabetes and diabetic ketoacidosis. 3. There is no fever, and there are no obvious physical abnormalities on examination.	CEA (−) CA-199 (−) Ki-67 (+, 25%)	Moderately differentiated tubular adenocarcinoma/ tub2 (crawling-type) Mucin subtype: mixed intestinal and gastric type	No lymph node metastasis was detected.	Esophagogastric junction mucosal lesion, ESD	Postoperative ESD for early gastric cancer
4	64	Male	1. The patient experienced a feeling of fullness in the middle and upper abdomen after eating 2 months ago without any obvious trigger. 2. The patient was previously healthy. 3. There was no fever, and no obvious abnormalities were found upon physical examination.	CEA (−) CA-199 (−) IHC: MUC2 (positive), MUC5AC (negative), MUC6 (partially positive), CD10 (negative), CDX-2 (positive), P53 (positive), HER2 (1+), SALL4 (occasionally positive), desmin (not involving mucosa muscle), EBER (negative), Ki-67 (positive, 80%).	High-intermediate tubular adenocarcinoma/ tub2 > tub1 (with some crawling-type morphological changes) (intermediate differentiation predominates); (2) mucin subtype: Intestinal-mixed type.	No lymph node metastasis was detected.	Endoscopic submucosal dissection of gastric antral mucosal lesion	Early gastric cancer ESD
5	55	Female	1. The patient experienced abdominal discomfort without any apparent cause 20 days before admission. 2. Healthy. There is no translation for this phrase in English. 3. Nont	CEA (−) CA-199 (−) IHC: (−)	Severe dysplasia of the local glandular epithelium, small foci of carcinoma (crawling-type), and small foci of signet cells found in the subepithelial layer of the mucosa.	No lymph node metastasis was detected.	Severe dysplasia of the local glandular epithelium, small foci of carcinoma (crawling-type), and small foci of signet cells found in the subepithelial layer of the mucosa.	Gastric cancer

(continued)

Table 1. (continued)

6	61	Male	1. The patient experienced a feeling of fullness in the middle and upper abdomen after eating 3 months ago without any obvious trigger. 2. Coronary heart disease for 1 year. There is no translation for this phrase in English. 3. Nont	CEA (−) CA-199 (−) IHC: (−)	Moderately differentiated adenocarcinoma (crawling-type), partial signet ring cell carcinoma (moderately to poorly differentiated)	No lymph node metastasis was detected.	The gastric angle mucosa is rough, with a scar from a previous ulcer.	Gastric cancer
7	63	Male	1. Upper abdominal distension for over a month 2. Chronic kidney disease 3. No family history	CEA (−) CA-199 (−) HER2 (1+), PD-L1 (−), hMLH1 (−), PMS2 (−), hMSH2 (+), hMSH6 (+), Ki-67 (+40%)	Adenocarcinoma, a small portion of which is crawling-type (also known as cystic-type)	No lymph node metastasis was detected.	Chronic atrophic gastritis (0-1) with erosions	Gastric cancer
8	Female	52	1. The patient experienced mild upper and middle abdominal discomfort without any apparent cause in the 6 months before admission. 2. Healthy. 3. No family history	CEA (−) CA-199 (−) MUC2 (+), MUC5AC (+), CD10 (+), MUC6 (+), P53 (+), HP (−), CDX2 (+), HER2 (1+), P504S (+), Ki-67 (+, 25%)	Moderately differentiated adenocarcinoma (crawling-type), with signet ring cell carcinoma (moderately to poorly differentiated)	No lymph node metastasis was detected.	Histopathological diagnosis: gastric body ulcer (nature to be determined by pathology)	Gastric cancer

diagnosis was crawling-type EGC (Figure 2). There was no recurrence after 1 year of follow-up.

Discussion

This study suggests that crawling-type EGC may exhibit distinct clinical characteristics and pathological features compared with classical GC. The rate of curative resection post-surgery appears satisfactory, and the short-term prognosis following surgical treatment may be favorable. These findings may provide valuable insights for diagnosing and treating this GC subtype.

In this case series, the mean age of the patients was 63.5 ± 13.45, slightly higher than previously reported by Woo et al.[10] The present study found that crawling-type EGC was mainly located in the upper part of the stomach, from the cardia to the fundus gland region and the gastric antrum. This finding differs from Haruta et al[5] earlier, who demonstrated that the middle third of the stomach was the preferential site for crawling-type EGC. The EGCs observed in the present study were mainly characterized by a flat morphology, whereas previous reports showed that more than 70% of crawling-type EGCs exhibited a depressed structure.[5,8,9] According to the Lauren classification,[13] most of these lesions were of the gastrointestinal mixed type. This result aligns with the classification of crawling-type EGC as a very well-differentiated GC of the intestinal type.[7,14,15] Notably, most of the lesions were limited to the mucosa, with only one tumor penetrating the submucosal layer, a finding supported by previous research.[14]

As the literature describes,[5,9-11] crawling-type EGC is characterized by unique histological features. In agreement with these reports,[5,9-11] the cases reported here displayed

Table 2. Pathology.

Patient No.	Preoperative Pathology	Postoperative Pathology
1	High-grade intraepithelial neoplasia of gastric mucosal glands	(1) Histological types: moderately differentiated tubular adenocarcinoma, small foci poorly differentiated adenocarcinoma, very small foci sigma-ring cell carcinoma/ tub2> > por> > sig; in some areas, the cell atypia is low, and the structure is obvious, and it is "crawling type." (2) Mucous type: gastrointestinal mixed type; (3) Number of tumors: 1; (4) Infiltration depth: carcinoma tissue infiltrates into the mucomuscular layer (MM); (5) Vascular condition: no vascular cancer thrombus or invasion was observed (ly-, v-); (6) Horizontal incisal margin (lateral incisal margin, pHM): the lateral incisal margin of the specimen was negative, and the nearest distance from the tumor was 0.5 cm (pHM-). (7) Vertical incisal margin (base incisal margin, pVM): The base incisal margin of the specimen was negative (pVM-);
2	Acute active stage of chronic atrophic gastritis, structural disorder of some glands in the neck of glands, suspicious early gastric cancer of crawling-type." HP (+)	(1) Histological types: moderate-differentiated tubular adenocarcinoma/tub2 (low cell atypia, "crawling type"), immunohistochemical CK shows scattered infiltration of individual cells (not found in HE morphology); (2) Mucus type: complete intestinal type; (3) Number of tumors: 1; (4) Tumor size: about 35 mm × 28 mm (5) Depth of invasion: LPM/pT1a; (7) Vascular condition: no vascular cancer thrombus or invasion was observed (ly-, v-); (8) Horizontal incisal margin (lateral incisal margin, pHM): the lateral incisal margin of the specimen was negative, and the nearest distance to the tumor was 0.6 cm (pHM-). (9) Vertical incisal margin (base incisal margin, pVM): the base incisal margin of the specimen was negative (pVM-);
3	High-grade intraepithelial neoplasia and canceration in glandular epithelium in cardiac epithelium.	(1) Histological types: moderate-differentiated tubular adenocarcinoma /tub2("crawling type"/hand-holding type); (2) mucous type: gastrointestinal mixed type; (3) Number of tumors: 1; (4) Tumor size: about 3.6 cm × 1.5 cm (5) Invasion depth: MM/pT1a; (6) Vascular condition: no vascular cancer thrombus or invasion was observed (ly-, v-); (7) Horizontal incisal margin (lateral incisal margin, pHM): the lateral incisal margin of the specimen was negative, (8) Vertical incisal margin (base incisal margin, pVM): The base incisal margin of the specimen was negative (pVM-), and the nearest distance from the tumor was 0.4 cm (pHM-).

(continued)

Table 2. (continued)

Patient No.	Preoperative Pathology	Postoperative Pathology
4	Chronic inflammation of gastric mucosa in the minor curvature of the gastric antrum, high-grade	(1) Histological type: highly to moderately differentiated tubular adenocarcinoma /tub2 > tub1 (in part, "crawling type" morphological changes) ("crawling type" is the major differentiation); (2) Mucous type: gastrointestinal mixed type; (3) Number of tumors: 1; (4) Tumor size: about 20 mm × 11 mm (5) Invasion depth: LPM/pT1a; (6) Vascular condition: no vascular cancer thrombus or invasion was observed (ly-, v-); (7) Horizontal cut margin (lateral cut margin, pHM): the lateral cut margin of the specimen is negative, and the nearest distance to the tumor was 0.6 cm (pHM-)
5	Pathological findings showed moderate chronic atrophic gastritis with intestinal metaplasia. (Inflammation ++, atrophy ++), moderate to severe activity (++-+++), mild enterification (+), severe dysplasia of local glandular epithelium, small focal carcinomas, and small focal sig-ring cells in the local mucosa lamina propria.	(1) Histological type: tubular adenocarcinoma, a small number of sigma-ring cell carcinoma. (2) Histological grading: moderate differentiation (3) Invasion of adjacent organs: (−) (4) Infiltration depth: limited to the mucosa (0-IIb) (5) Intravascular cancer thrombus: (−) (6) Nerve invasion: (−) (7) The upper incisal margin of the specimen: (−); lower incisal margin of specimen: (−) (8) Lymph node metastasis: total number: (0/17, number of metastasis/total number of lymph nodes) (9) Minor curvature of stomach (0/12); greater curvature of stomach (0/5); (10) Duodenal anastomosis: no cancer involvement was observed, and it was low-cell atypia moderately differentiated tubular adenocarcinoma (reptile carcinoma; "crawling-type") (11) Classification of Lauren: mixed type
6	Chronic atrophic gastritis (gastric angle), moderate intestinal metaplasia, moderate to severe atypical hyperplasia of glands in some areas due to less diagnosable tissue	(1) Histological type: adenocarcinoma partial sigma-ring cell carcinoma (2) Histological grade: medium-low differentiated adenocarcinoma (Japanese standard: hand-in-hand carcinoma) (3) Invasion of adjacent organs: (−) (4) Intravascular cancer thrombus: (−) (5) Nerve invasion: (−) (6) The upper incisal margin of the specimen: (−); lower incisal margin of specimen: (−); (7) Another cut edge :/; send another lower cutting edge :/ (8) Omental carcinoma nodules on the side of the lesser curvature of the stomach: (−); omental carcinoma nodules of the greater curvature of the stomach: (−) (9) Greater omental carcinoma nodules: (−) (10) Lymph node metastasis: total number (0/35, number of metastasis/total number of lymph nodes) (11) Gastric curvature (0/16); greater curvature of the stomach (0/19); chronic inflammation (anastomosis), no cancer involvement (12) Classification of Lauren: mixed type

(continued)

Table 2. (continued)

Patient No.	Preoperative Pathology	Postoperative Pathology
7	(Gastric antrum) ulcer, high-grade glandular intraepithelial neoplasia (antrum), focal canceration, background ulcer with chronic atrophic inflammation, intestinal metaplasia.	(1) Histological type: adenocarcinoma, with a small percentage of sigma-ring cell carcinoma (hand-holding carcinoma) (2) Histological grading: medium to low differentiation (3) Invasion of adjacent organs :/ (4) Intravascular cancer thrombus: (−) (5) Nerve invasion: (−) (6) The upper incisal margin of the specimen: (−); lower incisal margin of specimen: (−) (7) Omental carcinoma nodules on the side of the lesser curvature of the stomach: (−); (8) Omental carcinoma nodules of the greater curvature of the stomach: (−) (9) Greater omental carcinoma nodules: (−) (10) Lymph node metastasis: No cancer metastasis was observed in the total number (0/28, metastasis/lymph node number). (11) Classification of Lauren: mixed type;
8	Chronic atrophic inflammation, with intestinal metaplasia; adenocarcinoma.	(1) Histological type: moderately differentiated adenocarcinoma (hand-holding carcinoma) with sigma-ring cell carcinoma (2) Histological grading: medium to low differentiation (3) Invasion of adjacent organs: (−) (4) Intravascular cancer thrombus: (−) (5) Nerve invasion: (−) (6) The upper incisal margin of the specimen: (−); lower incisal margin of specimen: (−); (7) Omental carcinoma nodules on the side of the lesser curvature of the stomach: (−); omental carcinoma nodules of the greater curvature of the stomach: (−) (8) Greater omental carcinoma nodules: (−) (9) Lymph node metastasis: total number (0/19, metastasis/lymph node number), no cancer metastasis (10) Minor curvature of stomach (0/12); greater curvature of stomach (0/4); suprapylorus (0/3); (11) Classification of Lauren: mixed type;

Table 3. Treatments and Outcomes.

#	Excision Lesion Site	Gross Classification of Lesions	Surgical Method	Outcomes	Follow Up
1	Cardia	0-IIa + IIc	ESD	No recurrence	6 months to 1 year
2	Upper gastric body	0-IIb	ESD	No recurrence	6 months to 1 year
3	Cardia	0-IIb + IIa	ESD	No recurrence	6 months to 1 year
4	Antrum gastric	0-IIb + IIc	ESD	No recurrence	6 months to 1 year
5	Antrum gastric	0-IIb	Partial gastrectomy	No recurrence	6 months to 1 year
6	Upper gastric body	0-IIb	Partial gastrectomy	No recurrence	6 months to 1 year
7	Antrum gastric	0-IIc	Partial gastrectomy	No recurrence	6 months to 1 year
8	Antrum gastric	0-IIc	Partial gastrectomy	No recurrence	6 months to 1 year

heterotypic structures, crawling-type cells, and irregular glandular formations. These features are the most significant pathological characteristics of crawling-type EGC.[5,9-11] Among the 5 tumors containing signet ring cells, 4 had a small amount of signet ring cell carcinoma, and one case had a large area of signet ring cell carcinoma. Nevertheless, postoperative pathology still suggested curative resection. It is worth considering whether there is an association with older patient age, as most previous reports of signet ring cell carcinoma were in younger patients with poorer prognosis. This point warrants further exploration. The finding indicates that the presence of signet ring cells could be a helpful indicator for diagnosing crawling-type EGC, but it will have to be validated in future studies.

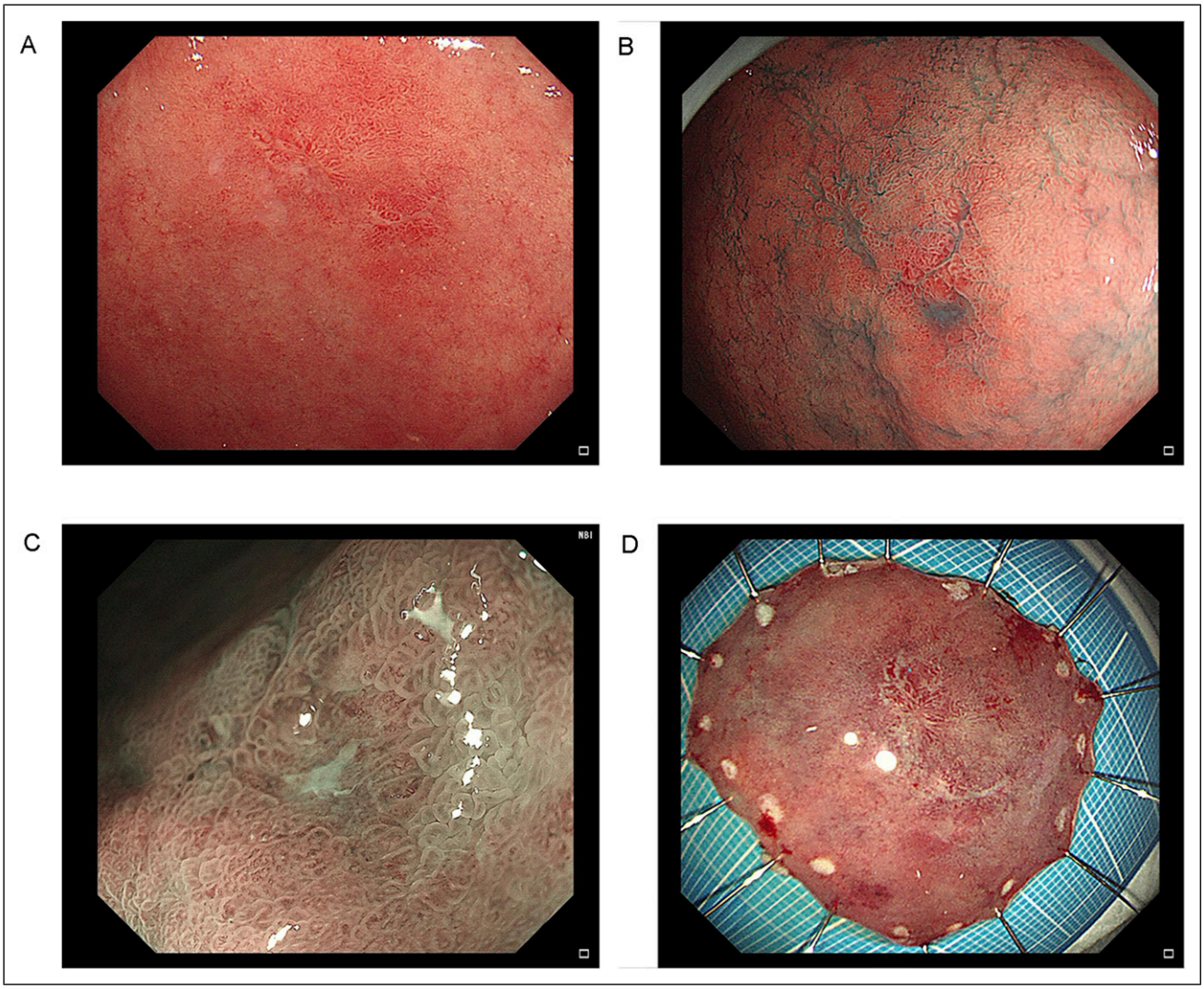

Figure 1. Patient #4. Endoscopic images. (A) Under white light. (B) Under Indigo blush dyeing endoscopy. (C) Magnifying narrow-band imaging showed irregular microsurface and microvascular patterns. (D) Endoscopic submucosal dissection.

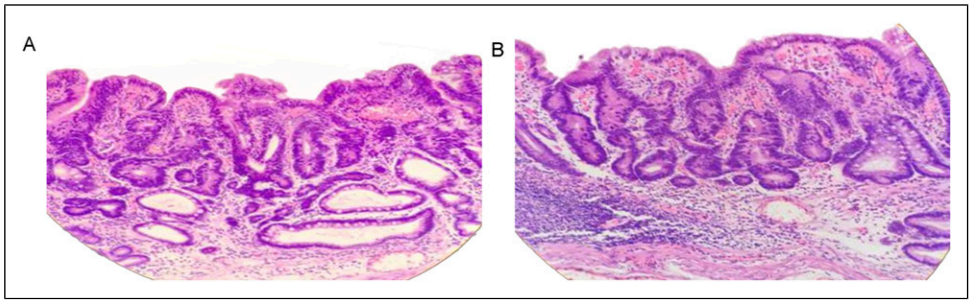

Figure 2. Patient #4. Postoperative histopathological findings of the primary lesion. There was a handshake structure in the glands of the lesion. Leica 3000 type light microscope (Leica, Wetzlar, Germany), eyepiece 10 × 22, objective lens ×10, ×20, ×40, ×60, and ×100 (oil lens). The magnification of the images is ×100. The section was stained with hematoxylin & eosin.

In addition, the present case series showed large tumors, with 6 being larger than 2 cm. The borders of the lesions were frequently poorly defined due to a lack of contrast with the surrounding non-neoplastic mucosa. These features may pose difficulties for the complete resection of lesions by ESD, as the absolute indications for ESD include highly or moderately differentiated intramucosal adenocarcinoma less than 2.0 cm in diameter without ulcerative changes.[16] Fortunately, no

recurrence events were found in any patient. In this case series, 4 patients underwent ESD, and 4 underwent partial gastrectomy. Although the long-term outcomes remain to be determined, treatment outcomes for all patients were optimal after 12 months of follow-up. ESD for crawling-type EGC can be difficult because of the similar appearance of the lesion to the adjacent tissue,[5] but it can still be possible in selected cases. Nevertheless, according to the "*Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer*,"[17] ESD treatment for crawling-type EGC should preferably meet the following indications: (1) UL0 cT1a differentiated-type carcinomas with a long diameter greater than 2 cm; (2) UL1 cT1a differentiated-type carcinomas with a long diameter measuring 3 cm or less; (3) UL0 cT1a undifferentiated-type carcinomas with a long diameter of 2 cm or less. Of course, the resection margins must be carefully evaluated, and the patient and surgeons must be prepared for an eventual gastrectomy if ESD has positive margins.

The present study had several limitations. Firstly, the sample size was small, precluding the observation of certain features. Secondly, the postoperative follow-up was short, impeding an assessment of the long-term efficacy of surgical resection. In addition, the study did not investigate the expression profiles of crawling-type EGC, a factor that could offer supplementary information for diagnosing this condition.

Conclusions

Crawling-type EGC may exhibit distinct clinical characteristics and pathological features from classical GC. Curative resection was achieved in all patients, and the short-term prognosis of surgical treatment may be favorable. Preoperative gastroscopy may potentially misdiagnose crawling-type EGC. The exact prognosis of crawling-type EGC remains unknown, and the selection of adjuvant treatments should be made based on the final pathological results.

Appendix

Abbreviations

EGC Early gastric carcinoma
ESD Endoscopic submucosal dissection
GC Gastric cancer

Author Contributions

(I) Conception and design: Kehan Li. (II) Administrative support: Jia Cao. (III) Provision of study materials or patients: Xiaofeng Zhuang, Bingyue Yao. (IV) Collection and assembly of data: Kehan Li, Qinwei Xu, Li Zhang. (V) Data analysis and interpretation: Tao Chen. (VI) Manuscript writing: All authors. (VII) Final approval of manuscript: All authors.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Academic Leaders Training Program of Pudong Health Bureau of Shanghai (Grant No. PWRd2021-02).

Ethical Statement

Ethical Approval

The study was conducted in accordance with the Declaration of Helsinki and received approval from the Ethics Committee of the East Hospital Affiliated to Tongji University (Approval No: 2024YS-270).

Informed Consent

The requirement for individual informed consent was exempted by the Ethics Committee of the East Hospital Affiliated to Tongji University due to the retrospective nature of the study.

ORCID iD

Jia Cao https://orcid.org/0000-0002-9207-9822

References

1. Ajani JA, D'Amico TA, Bentrem DJ, et al. Gastric cancer, version 2.2022, NCCN clinical practice guidelines in oncology. *J Natl Compr Canc Netw*. 2022;20:167-192. doi:10.6004/jnccn.2022.0008
2. Xia C, Dong X, Li H, et al. Cancer statistics in China and United States, 2022: profiles, trends, and determinants. *Chin Med J*. 2022;135:584-590. doi:10.1097/cm9.0000000000002108
3. Ushiku T, Arnason T, Ban S, et al. Very well-differentiated gastric carcinoma of intestinal type: analysis of diagnostic criteria. *Mod Pathol*. 2013;26:1620-1631. doi:10.1038/modpathol.2013.98
4. Hoshi H. Management of gastric adenocarcinoma for general surgeons. *Surg Clin*. 2020;100:523-534. doi:10.1016/j.suc.2020.02.004
5. Haruta Y, Nakanishi R, Jogo T, et al. Gastric cancer of "crawling type" detected by additional gastrectomy after endoscopic submucosal resection. *Anticancer Res*. 2018;38:2335-2338. doi:10.21873/anticanres.12479
6. Rubio-Fernández A, Díaz-Delgado M, Hernández-Amate A, García-Guerrero T. Poorly differentiated early gastric adenocarcinoma of mixed type with "crawling" pattern of extension. *Rev Esp Enferm Dig*. 2015;107:310-312.
7. Kushima R, Vieth M, Borchard F, Stolte M, Mukaisho K, Hattori T. Gastric-type well-differentiated adenocarcinoma and pyloric gland adenoma of the stomach. *Gastric Cancer*. 2006;9:177-184. doi:10.1007/s10120-006-0381-8

8. Xu YW, Song Y, Tian J, Zhang BC, Yang YS, Wang J. Clinical pathological characteristics of "crawling-type" gastric adenocarcinoma cancer: a case report. *World J Gastrointest Oncol*. 2024;16:1660-1667. doi:10.4251/wjgo.v16.i4.1660
9. Fujita Y, Uesugi N, Sugimoto R, et al. Analysis of clinicopathological and molecular features of crawling-type gastric adenocarcinoma. *Diagn Pathol*. 2020;15:111. doi:10.1186/s13000-020-01026-7
10. Woo HY, Bae YS, Kim JH, et al. Distinct expression profile of key molecules in crawling-type early gastric carcinoma. *Gastric Cancer*. 2017;20:612-619. doi:10.1007/s10120-016-0652-y
11. Okamoto N, Kawachi H, Yoshida T, et al. "Crawling-type" adenocarcinoma of the stomach: a distinct entity preceding poorly differentiated adenocarcinoma. *Gastric Cancer*. 2013;16:220-232. doi:10.1007/s10120-012-0173-2
12. von Elm E, Altman DG, Egger M, et al. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. *Ann Intern Med*. 2007;147:573-577. doi:10.7326/0003-4819-147-8-200710160-00010
13. Turner ES, Turner JR. Expanding the Lauren classification: a new gastric cancer subtype? *Gastroenterology*. 2013;145:505-508. doi:10.1053/j.gastro.2013.07.019
14. Yao T, Utsunomiya T, Oya M, Nishiyama K, Tsuneyoshi M. Extremely well-differentiated adenocarcinoma of the stomach: clinicopathological and immunohistochemical features. *World J Gastroenterol*. 2006;12:2510-2516. doi:10.3748/wjg.v12.i16.2510
15. Endoh Y, Tamura G, Motoyama T, Ajioka Y, Watanabe H. Well-differentiated adenocarcinoma mimicking complete-type intestinal metaplasia in the stomach. *Hum Pathol*. 1999;30:826-832. doi:10.1016/s0046-8177(99)90144-2
16. Ishihara R, Arima M, Iizuka T, et al. Endoscopic submucosal dissection/endoscopic mucosal resection guidelines for esophageal cancer. *Dig Endosc*. 2020;32:452-493. doi:10.1111/den.13654
17. Ono H, Yao K, Fujishiro M, et al. Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer (second edition). *Dig Endosc*. 2021;33:4-20. doi:10.1111/den.13883