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# Early gastric cancer with diffuse heterotopic gastric glands and granular cell tumors mimicking advanced gastric cancer

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## ABSTRACT

**INTRODUCTION:** Heterotopic gastric glands (HGGs) are gastric glands that are observed in the submucosa and are considered to be precancerous lesions or precursors of gastric cancer (GC). Granular cell tumors (GCTs) are benign neural origin tumors. Gastrointestinal GCTs are rare and gastric GCTs are seldom seen. We report the case of a patient who was diagnosed with early GC with diffuse HGGs affecting the whole stomach and two GCTs mimicking advanced GC.

**PRESENTATION OF CASE:** The patient is a 71-year-old male with epigastric discomfort. Gastrointestinal endoscopy revealed an ulcerated lesion at the mid-gastric body. A biopsy specimen indicated adenocarcinoma. Moreover, gastrointestinal endoscopy revealed a submucosal tumor at the posterior wall and multiple transparent protuberances across the entire stomach. Computed tomography demonstrated diffuse gastric wall thickening with lymphadenopathies. Total gastrectomy was performed under the preoperative diagnosis of advanced GC with lymph node metastases. The pathological diagnosis was adenocarcinoma invading submucosal stroma without lymph node metastasis, two GCTs, and diffuse HGGs affecting whole stomach.

**DISCUSSION:** Preoperative diagnosis of GC depth or range associated with HGGs is often difficult. Although diffuse HGGs are sometimes observed, there is no previous report of a case of HGGs with whole gastric wall thickening observed by computed tomography. As a result, this case was overdiagnosed as advanced GC. Although the relationship between GCTs and HGGs or GC is unclear, there is no case report of GCTs accompanied by HGGs or GC.

**CONCLUSION:** This case report suggested that cautious preoperative assessment for GC co-occurring with HGGs is required.

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## 1. Introduction

Heterotopic gastric glands (HGGs) are gastric glands that are observed in the submucosa. The incidence of HGGs is 4.0% to 20.1% among surgical specimens resected for gastric cancer (GC) or gastric ulcers, and an association between HGGs and GC has been reported [1–3]. Preoperative diagnosis of GC depth or range associated with HGGs is often difficult [4]. Granular cell tumors (GCTs) are benign, mesenchymal tumors that originate from Schwann cells [5]. GCTs may occur at many sites, the most frequent being the tongue, skin,

and subcutaneous tissue [5,6]. GCTs in the gastrointestinal tract are extremely rare, with only approximately 4% to 6% of all GCTs occurring in this location [6]. The esophagus is the most common location of GCTs in the gastrointestinal tract, followed by the colon, and gastric GCTs are seldom seen [6–8]. Here we report the case of a patient who was diagnosed with early GC with diffuse HGGs affecting the whole stomach and two GCTs mimicking advanced GC. This case report has been prepared in line with the SCARE criteria [9].

## 2. Presentation of case

A 71-year-old male was admitted to his family doctor with epigastric discomfort. Upper gastrointestinal endoscopy was performed and revealed an ulcerated lesion at the mid-gastric body. A biopsy specimen taken from the ulcerated lesion revealed moder-

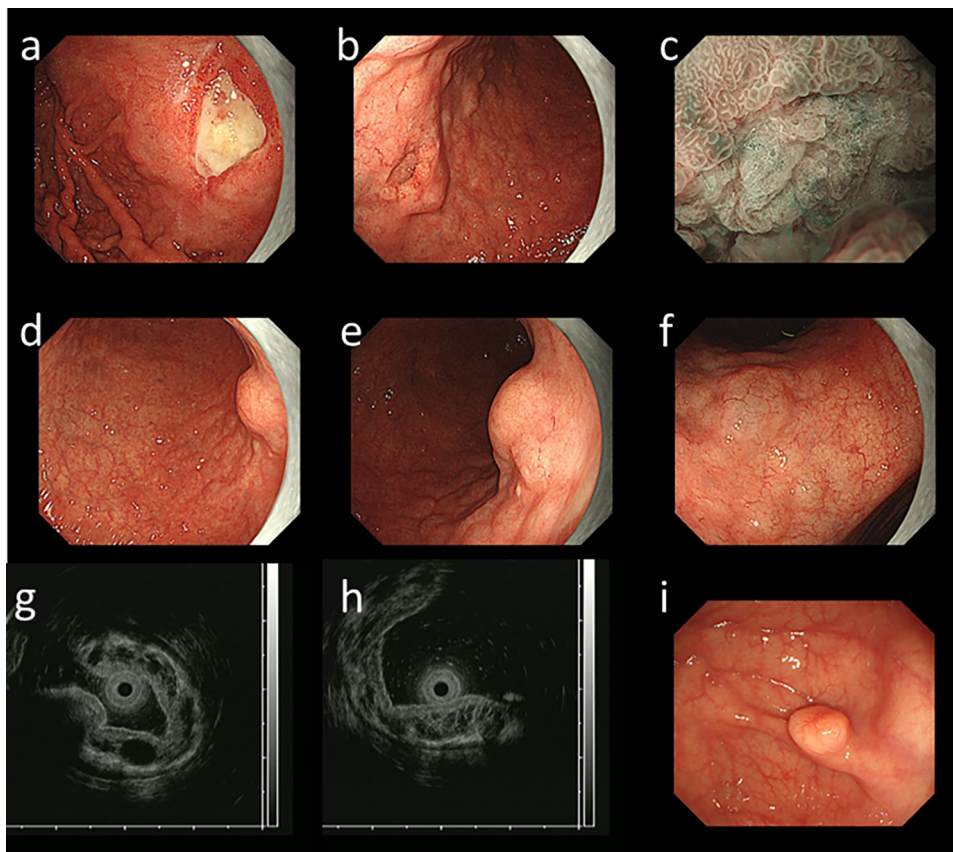
Abbreviations: HGGs, heterotopic gastric glands; GC, gastric cancer; GCTs, granular cell tumors.

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**Fig. 1.** Findings of gastroduodenal endoscopy and colonoscopy. (a) A 30 mm ulcerated lesion covered by regenerative epithelium with a smooth margin at the anterior wall of the upper-gastric body. This lesion suggested a benign ulcer. (b) An ulcerated lesion at the mid-gastric body. The biopsy specimen from this lesion revealed moderately differentiated adenocarcinoma. Multiple diffuse protuberances such as submucosal tumors were observed around the lesion. (c) Irregular ductal structures with deposition of white opaque substance at cancer lesion. (d) A 30 mm submucosal tumor at the posterior wall of the gastric angle. (e) Multiple protuberances around the submucosal lesion. (f) Multiple protuberances such as submucosal tumors were observed across almost the whole stomach. (g) Endoscopic ultrasonography of submucosal tumor. Circular low echoic lesion was observed. (h) Endoscopic ultrasonography of multiple diffuse protuberances. Multiple cystic low echoic lesions throughout almost the entire stomach were observed. These findings suggested heterotopic gastric glands. (i) Colonoscopy revealed an 8 mm submucosal tumor in the cecum. The biopsy specimen from this lesion revealed a granular cell tumor.

ately differentiated tubular adenocarcinoma. Thus, the patient was referred to our department. The patient was a smoker, had a history of habitual alcohol consumption, and reported a medical history of hypertension and hyperlipidemia. Regarding family history, his mother had GC.

Laboratory data indicated an elevated carcinoembryonic antigen level of 7.9 ng/ml. The remaining laboratory data were within normal limits. A repeat upper gastrointestinal endoscopy was performed (Fig. 1). In addition to the known GC lesion, a 30 mm ulcerated lesion covered by regenerative epithelium with a smooth margin at the anterior wall of the upper-gastric body was observed. The findings of this lesion suggested a benign peptic ulcer. Moreover, a submucosal tumor was detected at the posterior wall of the gastric angle. Endoscopic ultrasonography of the submucosal tumor revealed a circular low echoic lesion. Furthermore, multiple transparent protuberances such as submucosal tumors were observed across almost the entire stomach. Endoscopic ultrasonography of these lesions revealed multiple cystic low echoic lesions mainly at the second to third layer, and these findings suggested diffuse HGGs. Contrast study demonstrated an irregular ulcerated lesion surrounded by submucosal tuber at the anterior wall of the mid-gastric body (Fig. 2). This lesion seemed to spread under the submucosal layer. Although the range of the lesion was indefinite, this lesion was suspected to be invading to deeper submucosal stroma or the muscle layer. Gastric wall stiffening such as scirrhus GC was not observed. Colonoscopy revealed an 8 mm yellowish

submucosal tumor in the cecum (Fig. 1). Histological analysis of a biopsy specimen taken from this lesion revealed a GCT. Computed tomography demonstrated diffuse gastric wall thickening (Fig. 3). Lymphadenopathies around the cardia and lesser curvature were observed and lymph node metastases were suspected. The gastric wall thickening was observed close to the liver and direct invasion to the liver was suspected. In this case, the depth of GC invasion and the range of the lesion were indeterminate. Moreover, the etiology of diffuse gastric thickening was unknown, although involvement of HGGs was suspected. Therefore, total gastrectomy with D2 lymphadenectomy, omentectomy, and splenectomy was performed under the preoperative diagnosis of advanced GC with lymph node metastases.

Macroscopic findings of the resected specimen revealed diffuse gastric wall thickening of approximately 10 mm (Fig. 4). A GC lesion existed at the anterior wall of the mid-gastric body and gastric ulcer scarring was present at the anterior wall of the upper-gastric wall. Moreover, two yellowish submucosal tumors were detected at the posterior wall of the gastric angle and at the lesser curvature of the gastric body. Submucosal cystic changes were observed in the whole stomach. The pathological diagnosis was a moderately differentiated tubular adenocarcinoma invading submucosal stroma without lymph node metastasis, two GCTs, and diffuse HGGs affecting the whole stomach (Fig. 5).

Postoperatively, the patient recovered uneventfully and was discharged on postoperative day 14. At the time of writing this

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