

## Case Report

# Importance of Optical Diagnosis in Early Gastric Cancer: A Case Report of Early Gastric Signet Ring Cell Carcinoma

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**Date of Acceptance:**  
18-Mar-2017

**ABSTRACT** Gastric signet ring cell carcinoma (SRCC) is a rare form of highly malignant adenocarcinoma. It is an epithelial malignancy characterized by the histologic appearance of more than 50% of cells as signet ring cells filled with mucin. The incidence of SRCC is rising,<sup>[1,2]</sup> therefore, the diagnosis of these cancers in the early stage is important as it is the only stage that curative measures can be done. A 49-year-old female was hospitalized due to epigastric pain, postprandial bloating for 3 months. Upper gastrointestinal endoscopy with narrow band imaging (NBI) showed 1.5 cm lesion in the lesser curvature of the stomach with irregular pit pattern and accentuated vascularization of the surrounding mucosa. Histopathology confirmed the presence of more than 50% of the cells as signet ring cells. We report on the importance of optical diagnosis in early gastric cancer with the help of NBI, the subsequent patient management, and prognosis.

**KEYWORDS:** Gastric cancer, narrow band imaging, signet ring cell carcinoma

## INTRODUCTION

Since the advent of treatment to eradicate *Helicobacter*, the incidence of gastric adenocarcinoma has decreased. However, the incidence of signet ring cell carcinoma (SRCC) is rising, and SRCC is found in 8%–30% of gastric cancers. SRCC is more frequent in women than non-SRCC, with a sex ratio around 1, compared with <1/2 in gastric adenocarcinoma. SRCC occurs in younger patients, consistently 7 years before non-SRCC, with a mean age ranging from 55 to 61 years.<sup>[1,2]</sup>

Primary SRCC tumors are most often found in the glandular cells of the stomach. SRCC originates in the stomach in 90% of patients.<sup>[3]</sup> Although incidence and mortality of gastric cancer have declined in many countries over the past 50 years, there has been an increase in occurrences of gastric SRCC-type cancers.<sup>[4]</sup>

SRCC tumors grow in characteristic sheets, which makes a diagnosis using standard imaging techniques, such as computerized tomographic (CT) and positron emission tomography scans, less effective.<sup>[5,6]</sup>

In this case report, we demonstrate the importance of narrow band imaging (NBI) in the optical diagnosis of early gastric cancer.

## CASE REPORT

A 49-year-old female patient was admitted to the Department of Gastroenterology, complaining of 3 months epigastric pain and postprandial bloating, with worsening symptoms in the past 6 days before admission. The patient has a medical history of lumbar degenerative disc disease for which she was on nonsteroidal anti-inflammatory drugs (NSAIDs) at the time of admission. She is a nonsmoker, does not consume alcohol. On physical examination, there was epigastric tenderness. There was no family history, but the patient reported of polyallergy.

Upper gastrointestinal endoscopy showed a superficial, elevated lesion, about 1.5 cm in size at the lesser curvature of the stomach, a type 0-IIa lesion according to Paris classification [Figures 1 and 2].

At NBI endoscopy with near focus mode, there was microvascular, and microsurface changes. The pit pattern was irregular, and vascularization in the surrounding mucosa increased [Figure 3]. With the help of near focus

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**How to cite this article:** Akabah PS, Mocan S, Molnar C, Dobru D. Importance of optical diagnosis in early gastric cancer: A case report of early gastric signet ring cell carcinoma. *Niger J Clin Pract* 2017;20:1342-5.

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	DOI: 10.4103/njcp.njcp_289_16

mode, a more detailed examination of the mucosa was done, which highlighted the irregular gastric glands and disrupted blood vessels [Figure 4], multiple targeted biopsies were taken.

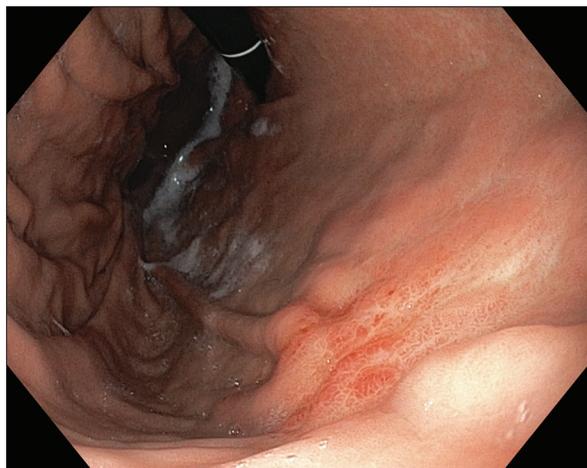
Histopathological examination with H and E stain showed tumor infiltration between the foveolar component and glands of the mucosa [Figure 5]. There was a minimal and superficial invasion of the muscularis mucosae, in the submucosa without reaching the muscularis propria. There was the presence of signet ring cells in abundance, over 50% of the cells [Figure 6].

A CT scan of the thorax, abdomen, and pelvis was performed for the purpose of the staging of the disease. There was neither metastasis nor lymph node invasion (T1M0N0), anatomic stage IA. Following informed consent, the margins of the tumor were marked with endoscopic hemoclips as the patient has polyallergy. We avoided marking the margins of the lesion by dye

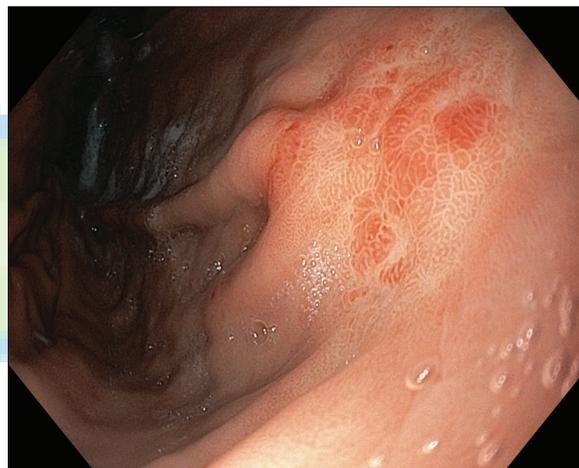
chromodiagnosis; methylene blue which is widely used in Romania. The patient underwent a gastrectomy and lymphadenectomy. The children of the patient are therefore kept in the database of the hospital for genetic screening of the germline CDH1 (E-cadherin) mutation between the ages of 20 and 30 years.

## DISCUSSION

Early gastric cancer is defined as an invasive carcinoma limited to the mucosa and/or submucosa with or without lymph node involvement, irrespective of tumor size. It measures 1–3 cm and may be easily missed during white light endoscopy (WLE) examination. Accurate diagnosis can be facilitated by very good understanding of the basic findings of WLE of early gastric cancer, and diagnosis can be further improved by the combined use of other imaging modalities such as image-enhanced endoscopy and electronic chromoendoscopy. Unlike



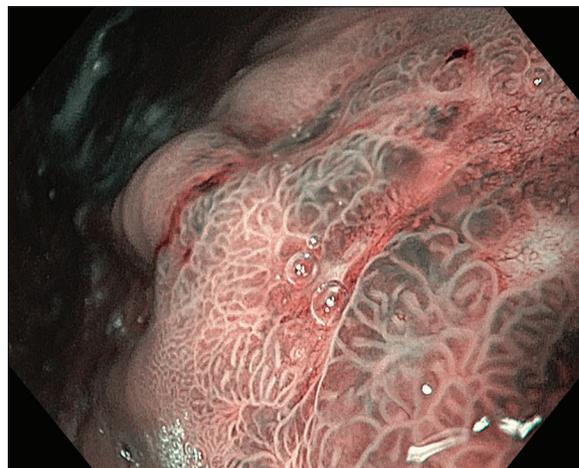
**Figure 1:** Retroversion view: White light endoscopy showing 1.5 cm lesion on the lesser curvature of the stomach



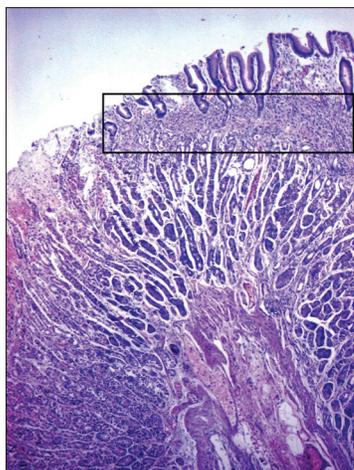
**Figure 2:** White light endoscopy showing 1.5 cm lesion on the lesser curvature of the stomach



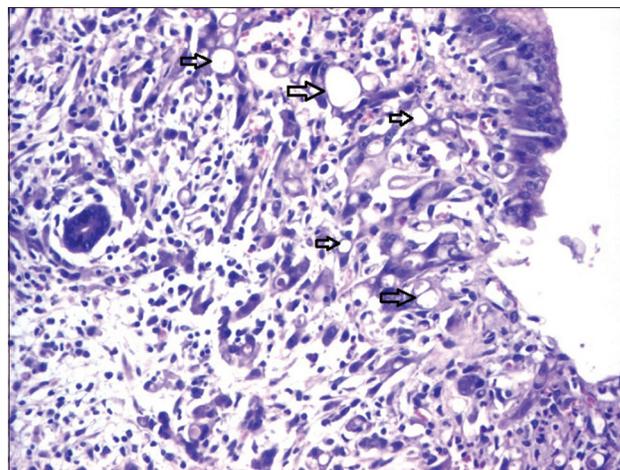
**Figure 3:** Narrow band imaging showing irregular pit pattern and increased vascularization in surrounding mucosa



**Figure 4:** Near focus mode, highlighting the irregular gastric glands and disrupted blood vessels



**Figure 5:** Infiltration of tumor between the foveolar component and glands of the mucosa



**Figure 6:** Histopathology slide showing large numbers of signet cells filled with mucin

advanced cancer which is easy to detect endoscopically, early gastric cancer often appears as minor changes in the mucosal surface. To avoid missing the presence of cancer on endoscopy, the characteristics of early stage disease must be well understood and gastric observation must be thorough and detailed while not underestimating the importance of the experience of the endoscopist.

A prospective randomized controlled trial that investigated differential diagnosis of small depressed gastric cancer and gastritis with depressed lesions of <1 cm proved that the accuracy with combined NBI magnification surpassed that with conventional WLE.<sup>[7]</sup> The trial revealed that when NBI magnification was conducted after conventional observation with white light, the diagnostic capabilities were excellent, with accuracy, sensitivity, and specificity all above 95%. The use of this method accurately distinguishes between cancer and gastritis, thereby reducing the number of unnecessary biopsies.<sup>[7]</sup>

NBI is a common type of equipment-based image-enhanced endoscopy that enhances the superficial surface structure and vascular architecture of the mucous layer by illuminating blue and green narrowband lights. Magnified endoscopy with NBI makes it possible to observe microvascular and microsurface patterns on the gastric mucosa in detail. Yao *et al.* combined changes in these patterns with the presence or absence of a demarcation line to establish a diagnostic system for gastric cancer called the VS classification system.<sup>[8]</sup> This method has proven effective in actual everyday clinical practice. NBI magnification for margin determination when conducting the detailed examination before endoscopic therapy or surgery is vital. This emphasizes the importance of electronic chromoendoscopy in the diagnosis in early gastric cancer.

The prognosis for gastric cancer depends on its stage at the time of diagnosis. The detection in the early stage of disease is important when complete removal is possible. This is the only curative method available for early gastric cancer.

In Europe and the United States, the EORTC St. Gallen International Expert Consensus defines the indications for endoscopic resections of early gastric cancer, largely following JGCA guidelines, except for gastric cancers with diffuse histology for which surgery is considered obligatory.<sup>[9]</sup> Thus, it is not recommended to perform endoscopic resection for early signet ring cell gastric cancer in western countries, whatever the depth of invasion in the gastric walls.

Some investigators have hypothesized that the natural history of HDGC involves the development of multiple foci of signet-ring cell carcinoma in most mutation carriers by 20–30 years of age with these lesions confined to the superficial gastric mucosa. There have been at least 6 separate series with patients with germline E-cadherin mutations who have undergone prophylactic total gastrectomy that have been reported.<sup>[10]</sup>

In these 6 studies, there were a total of 53 patients, and the majority of patients had normal upper endoscopies before their prophylactic total gastrectomies. Fifty patients (94%) had intramucosal or superficially invasive carcinomas identified in the gastrectomy specimen, and the majority of patients had multifocal disease. The findings of these studies confirm that the vast majority of patients with germline CDH1 mutation harbor foci of noninvasive or even invasive diffuse gastric adenocarcinoma despite usually normal screening endoscopies.<sup>[10]</sup>

In conclusion, a small gastric lesion which could have been caused by NSAIDs use and can be very easily missed at conventional endoscopy turned out to be an early gastric cancer which is curable in an

early stage. This emphasizes the fact that, electronic chromoendoscopy is an important diagnostic tool in the characterization of a gastric lesion. NBI with near focus mode helped to characterize the lesion which revealed disrupted pit pattern and irregular vascular structure. This enabled targeted biopsies, as compared to WLE which relies heavily on random biopsies that reduce the possibility of capturing malignant cells in these random biopsies. Targeted biopsies increase exponentially the rate of capturing malignant cells in biopsies taken thereby increasing the rate of accurate diagnosis.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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