Original paper

Heterotopic gastric mucosa of upper oesophagus: evaluation of 12 cases during gastroscopic examination

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Abstract

Introduction: Oesophageal heterotopic gastric mucosa mostly presents in the upper part of the oesophagus. It is commonly under-diagnosed because of its localisation.

Aim: To expose the association between heterotopic gastric mucosa and endoscopic features of the upper gastrointestinal tract.

Material and methods: A total of 1860 upper endoscopic examinations performed between January 2012 and July 2013 were analysed retrospectively. Endoscopic features and histological examinations of 12 heterotopic gastric mucosa (HGM) of the upper oesophagus were documented and evaluated retrospectively.

Results: There were 7 (58%) male and 5 (42%) female patients aged between 22 and 80 years with a mean age of 43.2 years. Heterotopic gastric mucosa was present in 12 (0.6%) of all patients. We were able to perform biopsy for histopathological observation on 8 (66%) of the 12 patients in which HGM was seen during endoscopy. Five (42%) patients with heterotopic gastric mucosa had oesophagitis. Los Angeles Grade A oesophagitis was found in all patients, and histologically proven Barrett's oesophagus was detected in only one patient.

Conclusions: When a patient has ongoing dyspeptic complaints and reflux symptoms despite the treatment, one should be careful about possible HGM during upper gastrointestinal endoscopy. The point to be taken into consideration for patients who have metaplasia or dysplasia within HGM may need to be considered for surveillance.

Introduction

Heterotopic gastric mucosa of the upper oesophagus, also termed "inlet patch", is heterotopic gastric mucosa (HGM) typically found in the oesophagus. It was first defined in 1805 by Schmit during a post-mortem examination [1]. Heterotopic gastric mucosa of the oesophagus is mostly localised at the upper sections of the oesophagus, and for this reason it usually cannot be diagnosed easily. Rarely, it can also been found in other parts of the oesophagus [2, 3]. It is often characterised as a congenital asymptomatic anomaly. However, there are some reports showing that this lesion may play a role in the development of web, stricture, ulcer, perforation, or fistula related to its capability of hydrochloric acid secretion [4–8]. These complications may be exacerbated by *Helicobacter pylori*, which colonise 73% of "inlet patches" [9, 10]. The infection rates probably correlate with the prevalence of *H. pylori* infection in the general population, and the role of *H. pylori* in HGM remains uncertain. Symptoms and morphological changes are the result of the damage caused by acid secretion from heterotopic gastric mucosa. Malign transformation and adenocarcinogenesis can also form in this region. Malignant progression of HGM occurs in a stepwise pattern, following the metaplasia-dysplasia-adenocarcinoma sequence [11]. A clinico-pathologic classification has been proposed which categorises HGM of the upper oesophagus into five distinct groups based on their clinical, endoscopic, and histological characteristics (Table I) [12]. Heterotopic gastric mucosa at the upper sections of the oesophagus can be seen in all age groups, its incidence varying between 0.1% and 3.8% [3, 13].

Aim

In this study, we retrospectively evaluated the endoscopic findings and the incidences of the patients with HGM during upper gastrointestinal system endoscopy.

Table I. Clinico-pathological classification for heterotopic gastric mucosa of the upper oesophagus

Category	Description	Symptoms/findings
1	Asymptomatic	None
2	Symptomatic	Laryngopharyngeal reflux
3	Symptomatic with benign complications	Strictures/webs/fistula/bleeding
4	Intra-epithelial dysplasia	None/non-specific
5	Malignant transformation	Asymptomatic/dysphagia

Material and methods

Between January 2012 and July 2013 upper gastrointestinal series (GIS) endoscopy was performed on a total of 1860 patients in Izmir Bozyaka Education and Research Hospital. Twelve HGM of the upper oesophagus were documented with endoscopic features and histological examinations, and evaluated retrospectively. All 1860 patients read the information form and gave their written consent prior to endoscopic procedure. Before endoscopy, 10% lidokain oral anaesthetic spray and sedation was applied to all patients. Patients were positioned left side down for the upper gastrointestinal system endoscopy, which was done by video endoscopy (Pentax and Olympus, Japan). The presence of dark pink velvety gastric mucosa was accepted as HGM. During the procedure biopsies were taken from the patients diagnosed with HGM, and the pathological results of those patients were evaluated separately. Two to four biopsy specimens were obtained from each HGM of the upper oesophagus as well as from the antrum and angular notch, to determine the presence of *H. pylori*, as well as from associated mucosa lesions in the upper oesophagus, as reference samples. All biopsy specimens were examined by a team of experienced histopathologists. The patients with *H. pylori* were subjected to 14-day eradication with triple therapy consisting of proton-pump inhibitors at two doses per day, clarithromycin at a dose of 500 mg, and amoxicillin at a dose of 1000 mg two times per day. Medical history of the patients was obtained from their medical files and their endoscopy results. The age and sex of the patients, localisation and size of HGM, pathology results, and demographic properties such as oesophagitis, hiatus hernia, Barrett oesophagus, gastritis, ulcer, and cancer were evaluated retrospectively. The severity of reflux oesophagitis was classified according to Los Angeles (LA) classification.

Results

A total of 1860 patients who underwent upper GIS endoscopic procedure in the endoscopy unit of Izmir Training and Research Hospital were evaluated retrospectively between January 2012 and July 2012. Inlet patch or HGM of the upper oesophagus was seen in 12 (0.6%) patients who went under endoscopic procedure. The demographic and histological properties of the HGM patients were evaluated (Table II). There were 7 (58%) male and 5 (42%) female patients aged between 22 and 80 years, with mean age 43.2 years. In all cases macroscopic lesions were dark pink with velvety appearance and appeared as oval patches with smooth and glossy surfaces, and they were differentiated from the surrounding oesophageal mucosa by their well-defined margins.

In the total of 12 cases, the diameter of the lesion was 1 cm or below in 5 (41%) cases, 1–2 cm in 5 (41%) cases, and larger than 2 cm in 2 (8%) of cases. We were able to perform biopsy for histopathological observation on 8 (66%) of the 12 patients in which HGM was seen during endoscopy. In those 8 cases, 4 patients had fundic type and 2 patients had antral type heterotopic gastric mucosa, 1 patient had oesophagus mucosa, and 1 patient had intestinal type gastric mucosa with *H. pylori* infection. In 10 of the 12 examined patients HGM was associated with chronic gastritis, bulbitis, and duodenitis. In 2 patients (16%) intestinal metaplasia were seen in the stomach and in 1 patient (8%) atrophy of the mucosa was present. In 9 (75%) of the examined patients whose biopsies were taken from the antrum, a stomach infection of *H. pylori* was detected. The *H. pylori* gastric infection was eliminated in all patients subjected to 14-day eradication using proton pump inhibitors, clarithromycin, and amoxicillin. The efficiency of this antibacterial treatment protocol in these patients was confirmed with control endoscopy. The subsequent endoscopic analyses showed no reinfection of *H. pylori* in this group of patients.

Dyspeptic complaints and reflux symptoms were presents in 9 (75%) patients and there were no symptoms in 3 (25%) patients. Los Angeles Grade A oesophagitis was observed in 5 (42%) of the 12 patients. Endoscopic short segment Barrett view was present in 1 (8%) HGM patient, and histopathologically there were also Goblett cells present in this case.

Discussion

Heterotopic gastric mucosa (inlet patch) is a birth defect that is rarely seen and is usually no larger than 1 cm. Heterotopic gastric mucosa can be smaller than

Table II. Demographic and histopathological characteristics of heterotopic gastric mucosa of the upper oesophagus

Parameter	Male	Female	Total
Gender	7 (58%)	5 (42%)	12 (100%)
Category of HGM of the upper oesophagus:			
Category 1	2	1	3 (25%)
Category 2	5	4	9 (75%)
Category 3	–	–	–
Category 4	–	–	–
Category 5	–	–	–
Histological type of HGM:	5 (60%)	3 (40%)	8 (100%)
Fundic type	3	1	4 (50%)
Antral type	1	1	2 (25%)
Intestinal type	–	1	1 (12.5%)
Esophagus mucosa	1	–	1 (12.5%)
Diameter of the lesion [cm]:			
< 1	3	2	5 (41%)
1–2	1	4	5 (41%)
> 2	1	1	2 (8%)
Oesophagitis LA Grade A	4	1	5 (42%)
Barrett oesophagus	1	–	1 (8%)
Helicobacter pylori infection	–	1	1 (8%)

1 cm or larger than 5 cm [14]. Oesophageal HGM is a congenital anomaly that evolves as the result of underdeveloped oesophageal epithelisation during the embryologic period [4]. The oesophagus is covered with single layer columnar epithelia during the 10th week of gestational life. During the fifth month squamous epithelia starts to develop on the mid third of the oesophagus and spreads through the distal and proximal regions from there. In the event that this process is not complete, some columnar cells remain at birth and consequently gastric glands are seen in the upper third part of the oesophagus [9, 15]. Macroscopically they have a velvety dark pink appearance. They could be one piece and/or multiple pieces as they could also surround the oesophagus in a circular pattern. Most HGM are located on the lateral walls, typically a few centimetres distal to the upper oesophagus [2, 4]. The sizes can vary from microscopic to as large as three to 5 cm. Most pa-

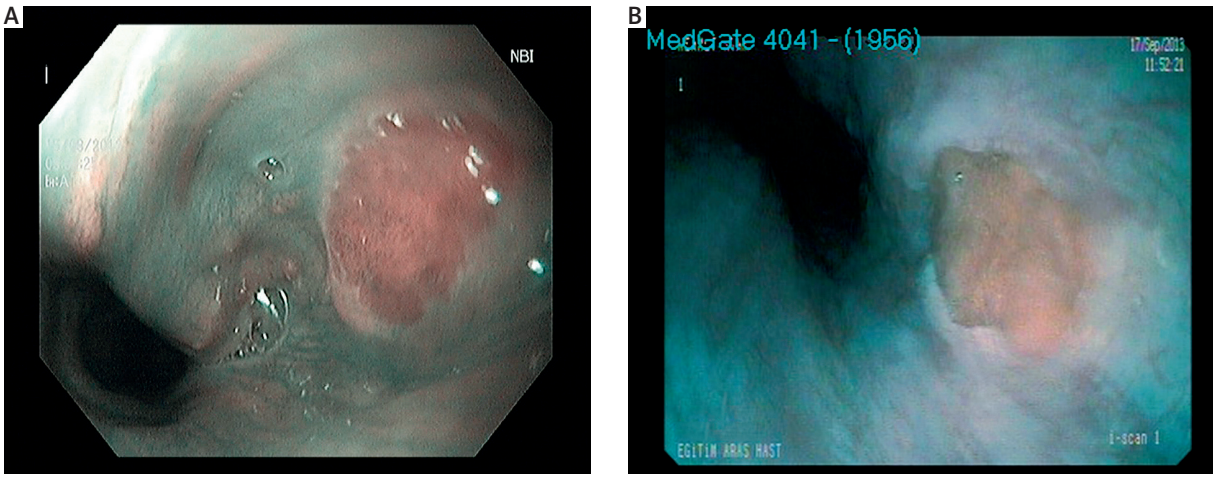

Figure 1. The HGM of the upper oesophagus is clearly more visible in the narrow band imaging mode of endoscopy

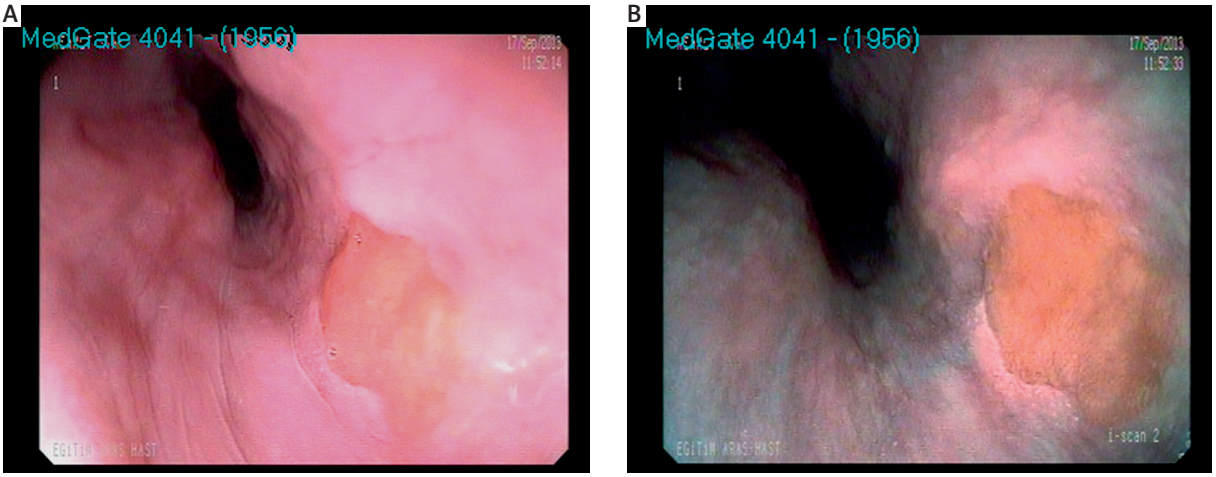

Figure 2. The HGM of the upper oesophagus in the normal light source mode of endoscopy

tients have a single patch, while in those with multiple patches, they tend to be small and are usually found within close proximity of other patches. On specialised imaging such as narrow band imaging instead of normal light source, the HGM of the upper oesophagus is clearly more visible (Figures 1 and 2).

Heterotopic gastric mucosa mostly settles at the cervical oesophagus and locally entailed pockets, strictures, ulcers, and fistula brings about the symptoms of pain, dysphagia, and odynophagia. The main factor in pathophysiology of symptomatic oesophageal HGM is acid production of the tissue in the area. The underlying factor of the symptoms, clinical findings, and complications is the secretion of acid where it should not be secreted. In asymptomatic cases, assessment of 24-hour pH profile could be helpful for the diagnosis.

Avidan *et al*. [16] showed that patients with HGM of the upper oesophagus had up to fivefold higher risk of Barrett's oesophagus compared to patients without HGM. Three other studies [17–19] have reported significant positive correlations while the others have not found any correlations [13, 20]. In our study, endoscopic short segment Barrett view was present in only 1 (8%) HGM patient, and histopathologically there were also Goblett cells present in this case. The question of malignant progression within HGM of the upper oesophagus is controversial. The heterotopic, but otherwise not malignant, epithelium may advance to invasive carcinoma following a metaplasia-dysplasia-carcinoma sequence [21]. Although the numbers of dysplasia and metaplasia in the diagnosed HGM of the upper oesophagus were limited (about 9% and 12%, respectively), and these lesions were relatively stable clinically, at the present stage of the study we cannot exclude the possibility of malignant progression of HGM into adenocarcinoma of the upper oesophagus [22].

Conclusions

When the patient has ongoing dyspeptic complaints and reflux symptoms despite the treatment, one should be careful in case of possible HGM during upper gastrointestinal endoscopy. The evaluation of the area, which is right below the upper oesophagus sphincter where HGM is most frequently observed, is very important in terms of diagnosis. Endoscopy combined with histopathological and microbiological analysis of biopsies is definitely a mandatory method in clinical evaluation of metaplastic and non-metaplastic changes within HGM of the upper oesophagus. The point to be taken into consideration for patients who have metaplasia or dysplasia within HGM may need to be considered for surveillance.

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