Chromoendoscopy and Magnification for the Evaluation of the Intragastric Extent of Atrophic Gastritis and Intestinal Metaplasia

Boeriu Alina[1], Dobru Daniela[1], Pascarenco Ofelia[2], Mocan Simona[3], Onișor Danusia[2]

[1] Internal Medicine VII, Gastroenterology Clinic, Faculty of Medicine, University of Medicine and Pharmacy, Tîrgu Mureș, Romania
[2] Gastroenterology Clinic, County Emergency Clinical Hospital, Tîrgu Mureș, Romania
[3] Department of Pathology, County Emergency Clinical Hospital, Tîrgu Mureș, Romania

Introduction: The detection of intragastric extent and progression of atrophic gastritis and intestinal metaplasia are mandatory in order to quantify the risk of development of the gastric cancer. The aim of the study is to assess the clinical value of magnifying endoscopy and chromoendoscopy in the evaluation of the intragastric extent of atrophic gastritis and intestinal metaplasia.
Material and methods: We performed magnifying chromoendoscopy with methylene blue and we identified modified patterns corresponding to premalignant gastric lesions. We studied the intragastric extent of these lesions. Biopsy specimens were taken from modified areas in order to confirm the presence of atrophic gastritis and intestinal metaplasia.
Results: We identified specific pit patterns for atrophic gastritis and intestinal metaplasia. In 21 patients (30%) these lesions were confined to gastric antrum. In 7 cases (17.5%), lesions were extended in gastric corpus. These patients were selected for further endoscopic surveillance.
Conclusions: Magnifying endoscopy and chromoendoscopy allow the detection of intragastric extent of intestinal metaplasia and atrophic gastritis. This could help to a better selection of patients for surveillance endoscopy.

Keywords: magnifying endoscopy, chromoendoscopy, atrophic gastritis, intestinal metaplasia, surveillance

Received: 2 May 2012

Introduction

The detection and surveillance of premalignant gastric lesions are important steps in early diagnosis of gastric neoplasia. These lesions are often identified by conventional gastrointestinal endoscopy with random biopsies. A well defined protocol for surveillance of patients with gastric atrophy and intestinal metaplasia does not exist. However, the detection of intragastric extent and progression of atrophic gastritis and intestinal metaplasia are mandatory in order to quantify the risk of development of the gastric cancer.

Material and methods

The aim of the study was to assess the clinical value of magnifying endoscopy and chromoendoscopy in the evaluation of the intragastric extent of atrophic gastritis and intestinal metaplasia. Previously evaluated by conventional gastrointestinal endoscopy patients were selected. Endoscopic changes of gastric mucosa detected during conventional endoscopy, such as atrophic appearance, erosions, nodular appearance, were indications for further investigation by magnification endoscopy and chromoendoscopy. Informed consent was obtained from all patients before the endoscopic examinations. Magnifying endoscopy in conjunction with chromoendoscopy using high-magnification gastroscope Olympus Gif-Q 160Z was performed. For a better identification of intestinal metaplasia, 0.5% methylene blue was applied on the gastric mucosa followed by an interval of 3–4 minutes waiting time in order to enable the dye spread; the gastric surface was washed with water and the excess of water and dye was removed by suction. Different gastric areas in antrum and corpus were magnified. Normal and modified mucosal patterns were identified. Biopsies specimens were taken from modified areas in order to confirm the presence of atrophic gastritis and intestinal metaplasia. The histologic samples were assessed by an experienced gastrointestinal pathologist according to the updated Sydney classification system. Gastric atrophy and intestinal metaplasia were evaluated in antrum and corpus. Chi-squared test was used for the comparisons between endoscopic and histological findings; p-value of less than 0.05 was considered to be statistically significant.

Results

Forty patients (28 women, 79% and 12 men, 30%), were investigated by magnifying chromoendoscopy. The identification of the blue-stained areas with specific tubular pattern was performed by using methylene blue stain (Figure 1).

We performed targeted biopsies from these areas in order to confirm the presence of intestinal metaplasia. Non-stained areas were also magnified for the detection of atrophic gastritis. Areas with the disappearance of normal pit pattern with irregular form of collecting venules were suspected for gastric atrophy (Figure 2). Targeted biopsies from these areas were taken.

Premalignant lesions confined to the gastric antrum were identified in 21 patients (30%). Thirty-three areas with tubular pattern in gastric antrum were also detected. Thirty-one of these areas (93.93%) were intestinal meta-

Correspondence to: Alina Boeriu
E-mail: aboeriu@gmail.com

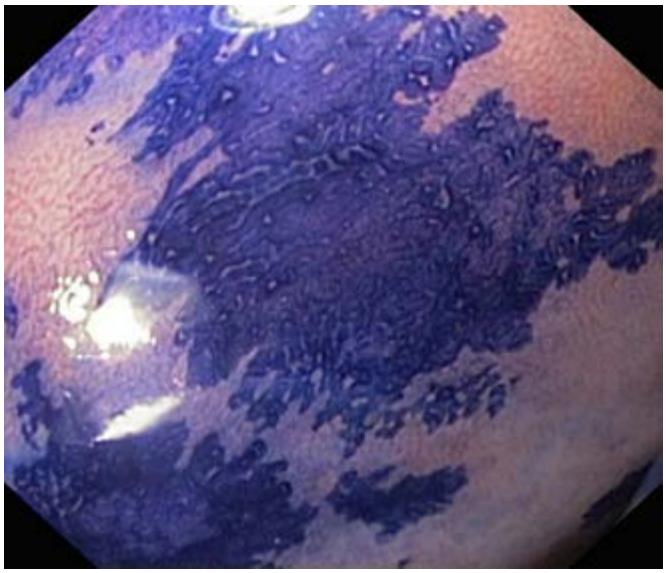

Fig. 1. Stained areas showing tubular pit pattern on magnification (intestinal metaplasia)

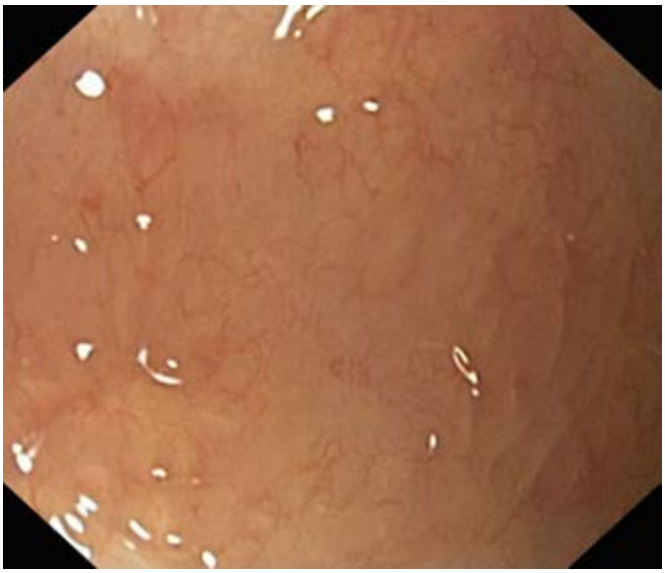

Fig. 2. Areas with irregular form of collecting venules on magnification (atrophic gastritis)

plasia at histological examination. Twenty-eight antral areas with atrophic appearance on magnification (disappearance of normal pit pattern and irregular form of collecting venules) were evaluated by targeted biopsies. Histologic confirmation of atrophic gastritis was obtained in 23 of these areas (82.14%).

We detected corporeal extension of premalignant gastric lesions in 7 cases (17.5%) (Figure 3 and 4).

Twelve homogenous blue-stained areas in gastric corpus were identified; specific tubular pattern was obtained by magnification. Nine of these areas (75%) with tubular pattern were intestinal metaplasia at histological assessment. From 15 corporeal areas showing irregular arrangement of collecting venules at magnification, 11 areas (73.33%) were atrophic gastritis at histological evaluation. The tubular pattern was found to be predictor for intestinal metaplasia ($p < 0.0001$). The disappearance of regular pattern and the presence of an irregular form of collecting venules were found to be predictors of atrophic gastritis ($p < 0.0001$).

Discussions

Atrophic gastritis and intestinal metaplasia are premalignant gastric lesions. The risk for gastric neoplasia is mainly related to the extension and severity of these lesions [1]. The intragastric extent of atrophic gastritis and intestinal metaplasia can be evaluated on conventional endoscopy with multiple biopsy samples [2]. Blind biopsies technique could underestimate the real extent of premalignant lesions in the stomach.

Other methods were used in order to improve the detection of extensive intestinal metaplasia and atrophic gastritis [3]. Previous studies demonstrated the correlation between intragastric extent of atrophic gastritis and serological pepsinogen levels [4]. The accuracy of surveillance of patients

Fig. 3. Corporeal extent of intestinal metaplasia

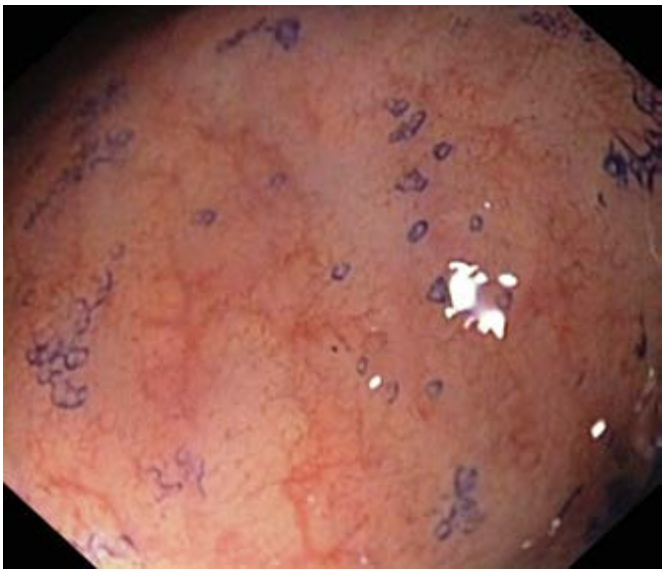

Fig. 4. Corporeal extent of atrophic gastritis

with premalignant gastric lesions also depends on multiple biopsies, especially for the evaluation of progression or regression of these lesions after therapy (i.e. the Helicobacter pylori eradication) [5].

New endoscopic techniques, such as magnification endoscopy, narrow band imaging, allow a better evaluation of the location and intragastric extent of premalignant lesions [6]. Mucosal patterns corresponding to intestinal metaplasia on magnification endoscopy were previously reported by other authors [7]. Specific pattern corresponding to atrophic gastritis was detected on magnifying endoscopy [8].

Our study showed that targeted biopsies from areas with modified patterns are useful for the detection of atrophic gastritis and intestinal metaplasia. Methylene blue application allowed a real-time evaluation of the extension of intestinal metaplasia in gastric antrum and corpus. Surveillance of these patients is easier to perform by comparing endoscopic images obtained at different period intervals. We obtained specific pattern for intestinal metaplasia (tubular pattern) and for atrophic gastritis (the loss of normal pattern and the detection of collecting venules with irregular arrangement), that correspond to the results reported by other authors.

Conclusions

Magnifying endoscopy and chromoendoscopy may serve as useful tools for the detection of intragastric extent of intestinal metaplasia and atrophic gastritis. This could help to a better selection of patients for surveillance endoscopy. A smaller number of biopsies are necessary to estimate the extension of the lesions whenever modified patterns are detected during magnification. Magnification and chromoendoscopy provide a real time evaluation of the patients who are at risk to develop gastric neoplasia.

Acknowledgement

This paper is partly supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU 60782.

References

1. Ching JYL, Leung WK, Lin SR. Factors predicting progression of gastric intestinal metaplasia: results of a randomized trial on Helicobacter pylori eradication. Gut. 2004;53:1244-9.
2. Correa P, Piazuelo MB, Wilson KT. Pathology of gastric intestinal metaplasia: clinical implications. The American Journal of Gastroenterology. 2010;105:493-498.
3. De Vries AC, Haringsma J, de Vries RA, ter Borg F, Nagtzaam NM, Steyerberg EW, van Dekken H, Kuipers EJ. The use of clinical, histologic, and serologic parameters to predict the intragastric extent of intestinal metaplasia: a recommendation for routine practice. Gastrointestinal Endoscopy. 2009;70(1):18-25.
4. Vaananen H, Vauhkonen M, Helske T, Kaariainen I, Rasmussen M, Tunturi-Hihnala H, Koskenpato J, Sotka M, Turunen M, Sandstrom R, Ristikankare M, Jussila A, Sipponen P. Non-endoscopic diagnosis of atrophic gastritis with a blood test. Correlation between gastric histology and serum levels of gastrin-17 and pepsinogen I: a multicentre study. Eur J Gastroenterol Hepatol. 2003;15:885-91.
5. Ohkusa T, Fujiki K, Takashimizu I, Kumagai J, Tanizawa T, Eishi Y, Yokoyama T, Watanabe M. Improvement in atrophic gastritis and intestinal metaplasia in patients in whom Helicobacter pylori was eradicated. Ann Intern Med. 2001;134:380-386.
6. De Vries AC, Van Grieken NCT, Looman CWN, Casparie MK, De Vries E, Meijer GA, Kuipers EJ. Gastric cancer risk in patients with premalignant gastric lesions: a nationwide cohort study in the Netherlands. Gastroenterology. 2008;134:945-952.
7. Dinis-Ribeiro M, da Costa-Pereira A, Lopes C, Lara-Santos L, Guilherme M, Moreira-Dias L, Lomba-Viana H, Ribeiro A, Santos C, Soares J, Mesqiuta N, Silva R, Lomba-Viana R. Magnification chromoendoscopy for the diagnosis of gastric intestinal metaplasia and dysplasia. Gastrointestinal Endoscopy. 2003;57(4):498-504.
8. Anagnostopoulos GK, Yao K, Kaye P, Fogden E, Fortun P, Shonde A, Foley S, Sunil S, Atherton JJ, Hawkey C, Ragunath K. High-resolution magnification endoscopy can reliably identify normal gastric mucosa, Helicobacter pylori-associated gastritis, and gastric atrophy. Endoscopy. 2007;39:202-207.