MAGNIFYING ENDOSCOPY AND CHROMOENDOSCOPY IN ATROPHIC GASTRITIS, INTESTINAL METAPLASIA AND GASTRIC DYSPLASIA

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Abstract: *Introduction: the detection of gastric preneoplastic lesions (atrophic gastritis, intestinal metaplasia, dysplasia) is important regarding the patient's risk evaluation for gastric cancer. The purpose of this study consists in the pit pattern evaluation, specific to the 3 premalignant lesions by magnifying endoscopy and chromeondoscopy. Material and methods: The study has started in January 2010 and it is still in progress. The patients have been examined by conventional endoscopy, respectively selected for magnifying endoscopy and chromoendoscopy. Partial results: I have obtained pit patterns specific to gastric mucosa in precancerous lesions. Partial conclusions: 1. Several pit patterns can be identified in the same patient. 2. The stomach can be mapped more exactly, this way being identified the area of modified mucosa; thus target biopsies can be done raising the chances for an accurate diagnosis. 3. It is a resource and time-consuming method.*

Cuvinte cheie: *leziuni preneoplazice gastrice, endoscopia cu magnificatie, cromoendoscopia*

Rezumat: *Introducere: Detectarea leziunilor preneoplazice gastrice (gastrita atrofică, metaplazia intestinala, displazia) este importantă din punct de vedere al evaluării riscului pacientului pentru cancerul gastric. Scopul studiului constă în evaluarea pit pattern-ului specific celor 3 leziuni premaligne prin endoscopia cu magnificatie si cromoendoscopie. Material si metoda: Studiul a inceput in ianuarie 2010 si este în derulare. Pacienţii au fost examinaţi prin endoscopie convenţională, respectiv selectaţi pentru cromoendoscopia cu magnificaţie. Rezultate partiale: Am obţinut pit pattern-uri caracteristice mucoasei gastrice în leziunile precanceroase. Concluzii partiale: 1. La acelaşi pacient pot fi identificate mai multe pit pattern-uri 2. Se poate cartografia mai exact stomacul, identificându-se astfel ariile de mucoasă modificată; astfel se pot efectua biopsii ţintite, crescand şansele unui diagnostic corect; 3. Este o metoda consumatoare de timp si resurse.*

INTRODUCTION

Gastric cancer is one of the most important causes of mortality in the world, thus recognizing its antecedents (atrophic gastritis, intestinal metaplasia, light, medium and severe dispalsia) is important.(1) At a high level, conventional endoscopy detects these premalignant lesions and offers the possibility of sampling biopsies. The appearance of new investigation methods, such as magnifying endoscopy and chromeondoscopy, allows the improvement of diagnostic accuracy (2), targeted biopsies and the corresponding monitoring of the patient. Some authors recognize the benefits of the annual endoscopic monitoring of the patients having atrophic gastritis and intestinal metaplasia.(3)

PURPOSE

The purpose of the study consists in detecting the specific pit patterns of premalignant lesions, correlated with the histopathological aspect, as well as in assessing the difficulties and challenges that the method appliance and result interpretation assume.

METHODS

The study has started in January 2010 and it is still developing; until now, 60 patients have been enlisted and submitted to magnifying endoscopy. These patients have been selected from a number of 180 patients in which modified gastric mucosa has been diagnosed by conventional endoscopy. In this study, we present the partial results obtained after magnifying endoscopy and chromeondoscopy investigation. The included patients have been selected from those who addressed the Gastroenterology Clinic of Mureş County Hospital for dyspeptic symptoms in which conventional endoscopy has been applied and in which preneoplastic lesions have been detected by the histopathological evaluation of gastric biopsies. Having the patient's assent and after obtaining the informed consent, the magnifying endoscopy has been applied.

The examination requires the patient's cooperation for easing the detailed examination of gastric mucosa. This method has been done by using a light temporary Propofol anaesthetic agent under the anaesthesiologist's supervision.

Magnifying endoscopy is an investigation that allows the mucosal details to be examined by enlarging the image. We have used an Olympus Gif-Q 160Z endoscope that enlarges the image 115 times using a set of mobile lens, allowing the examination of mucosa structure and vascular architecture.

For an even more accurate evaluation, the endoscope has to be maintained to a certain distance from the gastric mucosa, reason for which a transparent head is placed on the top of the endoscope. For the beginning, a mucolytic agent (N acetylcistenia 10%) has been administrated for the removal of

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the mucous layer and for facilitating the colouring assessment.

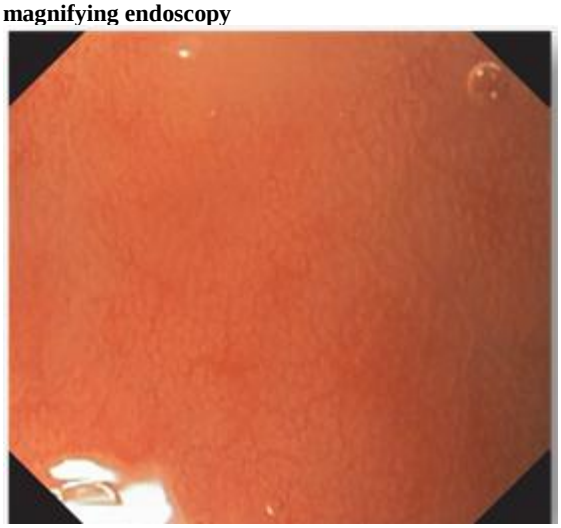
I have examined the gastric mucosa for lesions localization without using the magnification method, then with a catheter spray introduced through the endoscope operator channel, I applied the colouring on the gastric mucosa. The frequently used colouring agents are the acetic acid having a concentration of 1-3% and a PH of 2, 55 which determines the reversible denaturation of a protein of cellular cytoplasm, having a temporal whitening reaction of modified zones, or methylene blue which is absorbed by the metaplastic cells. The applied colouring quantity has been of 10 – 20 ml solution. After a period of time needed for the colouring to be fixed, I have examined the entire gastric mucosa and I made photos of the modified pit pattern. The sampling biopsies of these areas allowed the histopathological assessment in the Pathologic Anatomy Department for identifying the premalignant gastric lesions. The pit patterns evaluation has been realized by 3 gastroenterologists with the identification of the normal mucosal patterns, respectively the modified patterns.

RESULTS

By magnifying, I have analyzed two different endoscopic aspects at the gastric mucosa level: the gastric glands openings aspect and the architecture of the subepithelial capillary network. After identifying the modified mucosa by the conventional endoscopy, I have especially analyzed these areas and the neighbouring ones by magnification. Thus, in the same patient, I have obtained different pit patterns areas.

The normal gastric mucosa of gastric corpus aspect at magnifying endoscopy consists in a regular arrangement of glandular openings and of the subepithelial capillary network, as well as of the collecting venules. (figure no. 1)

Figure no. 1. The normal corporal gastric mucosa aspect by magnifying endoscopy



At antral level, the subepithelial network presents a coil shape aspect, without emphasizing the glandular openings. (figure no. 2)

In atrophic gastritis, I have noticed an irregular arrangement of the collecting venules, without having a normal vascular subepithelial network aspect and of the glandular openings aspect. (figure no. 3) This endoscopic aspect characteristic to gastric atrophy has been confirmed by targeted biopsies sampling and by histological assessment.

The discovery of the extended and disseminated areas of intestinal metaplasia has been facilitated by applying methylene blue, the analysed areas corresponding to the metaplasic epithelium. After identifying and delimiting this area, the target magnification allowed the detection of a pit pattern specific to the intestinal metaplasia: the tubular pit pattern type. Further, the targeted biopsies sampling has confirmed the intestinal metaplasic diagnosis.

The detection of an irregular pit pattern in the case of the patients diagnosed with gastric atrophy and metaplasy, araises the suspicion of dysplasic lesions. Sometimes, these pit patterns irregularities, without microvascular modifcations, appear in chronic inflamation at the mucosa level of intestinal metaplasy.

Figure no. 2. The normal antral gastric mucosa by magnifying endoscopy

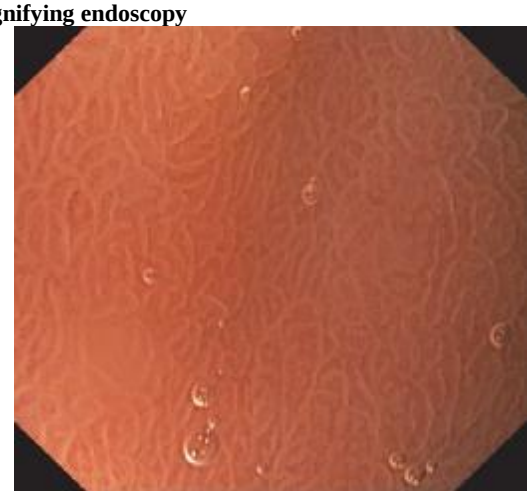


Figure no. 3. Atrophic gastritis aspect by magnifying endoscopy

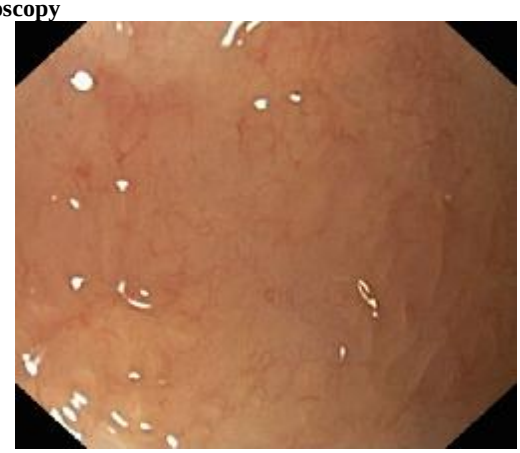
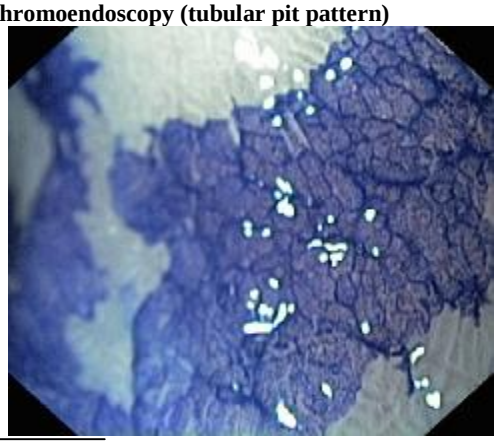


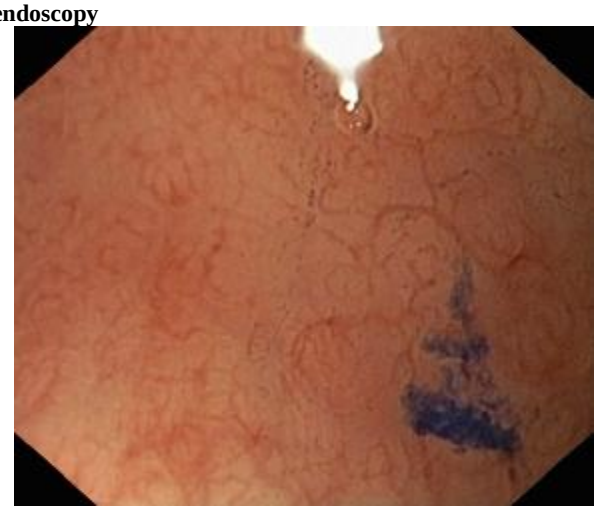
Figure no. 4. The intestinal metaplasic aspect by methylene blue chromoendoscopy (tubular pit pattern)



Modifications of microvessels and variations of their size, as well as the detection of an irregular pit pattern, have corresponded to gastric mucosa area with high level dysplasia. (Figure no. 5)

The targeted biopsies sampling of these areas is essential, and the confirmation of high level dysplasia diagnosis imposes both mucosal endoscopic and surgical therapy, according to the international guides.

Figure no. 5. High level dysplasia aspect by magnifying endoscopy



Regarding the difficulty of this method and based on our clinical experience, we appreciate that the current use of magnifying endoscopy in daily practice assumes certain challenges: the method is more laborious, time consuming, it needs the anaesthetist's assistance for obtaining the accomplishment of the optimum conditions. At the same time, the subsuming of the obtained pit patterns, in the sense of varieties and of certain difficulties of interpretations, shows that the method needs to be standardised and to adopt a unitary terminology.

DISCUSSIONS

Yagi et al. (6,7) described in vivo for the first time the microvascular architecture of gastric mucosa corpus, and Yao (8) described the one of gastric antrum.

In 2003, Redeen, Petreson et al. have led a study that proved the fact that the absence of lines and the existence of visible blood vessels in gastric mucosa examination by conventional endoscopy are predictive for atrophic gastritis, but these endoscopic aspects present a low sensitivity.

The recent studies suggest the fact that the examination by chromoendoscopy in association with magnification increases the diagnostic accuracy of premalignant gastric lesions.(2,3) The modifications to the secondary gastric mucosa, inflammation induced by Helicobacter pylori infection have been evaluated by using magnifying endoscopy applied by Anagnostopoulous et al.(1) Similarly to the results reported by these authors, I have identified the irregular arrangement of the collecting venules and the disappearance of the normal aspect of the subepithelial vascular network, corresponding to atrophic gastritis.

The use of methylene blue has facilitated the delimitation of intestinal metaplasy areas, and the pit patterns analysis in these areas has highlighted a specific tubular aspect, which corresponds to the results reported in the studies conducted by other authors.(2) The patient's monitoring can be thus, facilitated by sampling biopsies of the modified area, while the topography and the extension of the metaplastic lesions can be appreciated in real time, allowing thus the risk evaluation for gastric cancer.

In accordance with the modifications reported by international authors (7,8), the identification of irregular pit pattern assumes a careful evaluation of gastric mucous because its association with peculiar vascular drawing, consisting in irregular microvessels in size, arrangement and distribution, corresponds to an incipient neoplastic process. The appliance of acetic acid has allowed us to see these lesions of itraepithelial dysplasia type with a high level of malignity.

CONCLUSIONS

Magnifying endoscopy and chromoendoscopy are methods that facilitate the detection of premalignant gastric lesions, allowing monitoring of these lesions by targeted biopsies sampling. Not all patients are eligible for this investigation, being a laborious method, resource and time-consuming method. The patients' selection after a prior conventional examination may be an alternative for the improvement of the diagnosis accuracy. The validation and adopting of a unitary terminology at international level needs advanced studying according to a standard protocol and training in leading such an investigation.

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