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# Gastric intestinal metaplasia: can we abandon random biopsies

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Gastric intestinal metaplasia (GIM) is a precancerous condition from which gastric cancer may develop. Usually after chronic *Helicobacter pylori* infection, damage to the stomach glands occurs, leading to gastric atrophy. In some cases, the substitution with intestinal tissue causes GIM that is the most reliable marker for the development of dysplasia and gastric cancer [1]. Genetic or familial factors aside, GIM, especially in its extensive form involving both the gastric antrum and body, is the phenotype considered to be high risk for neoplastic changes. Performing five random biopsies during white light gastroscopy, following the updated Sydney System [2], used to be the standard for the diagnosis and staging of GIM, as well as for other gastrointestinal conditions for which use of random biopsies performed during white light endoscopy are still widespread.

However, cumulative evidence in recent years suggests that virtual chromoendoscopy has higher accuracy than white light for the diagnosis of GIM [3,4] and affords the possibility of taking biopsies where GIM is suspected, resulting in targeted rather than random biopsies. In a comparison between optical diagnosis using electronic chromoendoscopy and histological examination, virtual chromoendoscopy showed a high correlation, especially with the advanced stage of GIM [5], and Dias-Silva et al. demonstrated that the learning curve for using it to diagnose GIM is short [6].

Current European guidelines [7] suggest that at least two biopsies should be taken from the antrum and two from the corpus to diagnose and stage GIM, but they clearly state that "whenever available and after proper training, virtual chromoendoscopy, with or without magnification, should be used for the diagnosis of gastric precancerous conditions, by guiding biopsy for staging atrophic and metaplastic changes and by helping to target neoplastic lesions."

This was the aim of the study by Faknak et al. [8] published in EIO, in which the authors compared the accuracy of targeted biopsies with the use of electronic chromoendoscopy for targeted biopsies plus random biopsies following the Sydney system protocol, for the diagnosis of extensive GIM. Targeted biopsies alone showed a high accuracy even when performed by non-expert endoscopists, making this method a valid alternative for extensive GIM diagnosis. This study confirms the importance of targeted biopsies, as was previously shown by Buxbaum et al. [9], who compared the accuracy of targeted biopsies performed during white light endoscopy to targeted biopsies performed with electronic chromoendoscopy and to mapping protocol biopsies for the diagnosis of GIM, demonstrating that the best approach would be electronic chromoendoscopy with targeted biopsies plus biopsies following the Sydney System. Indeed, while in the study by Faknak et al., extensive GIM was missed in only 5.2% of patients by using target biopsies alone, in the study by Buxbaum et al., targeted biopsies alone performed with the use of electronic chromoendoscopy missed 35% of cases of GIM, but it facilitated diagnosis in 18% of patients that would have been missed by the other methods. Concerning the number of biopsies, in both studies, the median number of targeted biopsies was significantly lower than with the other methods, suggesting that the use of targeted biopsies could be

adopted to save time and resources. Regarding the staging of extensive GIM, in the study by Faknak et al., diagnosis of extensive GIM was based on the presence of GIM in the body. This method overestimated the presence of extensive GIM as being in 5.2% of patients. However, this technique would overestimate patients with autoimmune gastritis who, most of the time, present with GIM in the body but not in the antrum, resulting in misdiagnosis of extensive GIM. This could be overcome using simple classification (Endoscopic Grading of Gastrointestinal Metaplasia), based on the analysis of five areas of the stomach, grading the percentage of GIM in each area with the use of electronic chromoendoscopy, as validated by Esposito et al. [5]. In this study, targeted biopsies were used to stage the presence of GIM and this classification showed a high accuracy compared to histological exam for the diagnosis of the advanced stage of GIM. Also, this probably would be observed by other providers of electronic chromoendoscopy, as has been shown by Castro R et al. [10].

Given the importance of optical diagnosis, as demonstrated by recent studies, the European Society of Gastrointestinal Endoscopy (ESGE) realized the need to provide standards for optical diagnosis training so that endoscopists can develop the ability and maintain the skills acquired to use the technology. With this aim, a position statement for the definition of a curriculum for optical diagnosis in Europe was recently published [11]. The curriculum guides endoscopists through the necessary steps to achieve and preserve the ability acquired so that every endoscopist can perform an appropriate optical diagnosis. This skill would help endoscopists with many aspects of endoscopy, from its use for gastric intestinal metaplasia to inflammatory bowel disease, Barrett's esophagus, and diminutive colorectal polyps. In this context, ESGE included in each curriculum topic information on the main categories and the potential positive or negative consequences of a correct or incorrect optical diagnosis in a very recent position statement [12]. This process represents the first step, even before further development of artificial intelligence, to disseminate knowledge about optical diagnosis to all endoscopists in order to optimize treatment and surveillance interval decisions based on optical diagnosis standards.

For this reason, optical diagnosis represents the main goal for several gastrointestinal diseases. In this context, electronic chromoendoscopy could be used to detect the advanced stage of GIM and patients at risk of developing gastric cancer. This could be done by using optical analysis of the entire stomach to replace histological exam, and targeted biopsies, if needed (probably only for an *H. pylori* diagnosis or if any neoplastic change is observed). This approach could better identify the presence of GIM and stage it, saving biopsies for gastroscopies, and could probably be adopted as the new standard in the next version of the European guidelines.

## Competing interests

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