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Editorial

Endoscopic ultrasonography for determining the depth of cancer invasion in gastric cancer

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Endoscopic ultrasonography for diagnosis of submucosal invasion in early gastric cancer
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To determine the depth of cancer invasion in gastric cancer, Matsumoto et al.,[1] in their article in this issue of the *Journal*, classified the features of the third layer on endoscopic ultrasonography (EUS) of tumor lesions into five patterns. Several studies have reported classification of the features of the third layer on EUS. Most of the reasons for such classifications were to distinguish between the layer distractions caused by cancer and those caused by ulcer. The layer distractions caused by ulcer were reported to be asymmetric and fan-shaped and thinner than the normal third layer.[2,3] Usually, the layers which cancer had invaded were thicker than the normal layers. Nakamura et al.[4] classified six patterns: type I, mucosal cancer without ulcer scar; type III, cancer invading the submucosa without ulcer, when lesions co-existed with an ulcer scar; type II1, type II2, and type UL, mucosal cancer; and type II3, cancer invading the submucosa. Their accuracy rate was 100% for mucosal cancer without ulcer, 85% for cancer invading the submucosa without ulcer, 73% for mucosal cancer with co-existing ulcer, and 75% for cancer invading the submucosa with ulcer.[3] Kida et al.[5] classified four patterns for mucosal cancer and four patterns for cancer invading the submucosa. Their accuracy rate was 92% for mucosal cancer and 73% for cancer invading the submucosa; when there was co-existing ulcer or ulcer scar, the accuracy rate was lower; 73% for mucosal cancer and 75% for cancer invading the submucosa. Chonan[6] classified 11 patterns; he divided the patterns into three groups: mucosal cancer, cancer slightly invading the submucosa (sm1), and cancer invading the submucosa (sm2–3); the accuracy rates were 89% for mucosal cancer, 20% for sm1, and 84% for sm2,3. In lesions with coexistent ulcer or ulcer scar, the accuracy rates for mucosal cancer, sm1, and sm2,3 were 84%, 16%, and 70%, respectively. Accordingly, the accuracy for detecting cancer with co-existing ulcer or ulcer scar was lower than that for cancer without ulcer regardless of the classification pattern.

Nakamura et al.[7] reported a lower accuracy in unusual cases. In the article by Matsumoto et al.,[1] lesions with co-existing ulcer or ulcer scar were excluded; accordingly, classification did not differentiate from the distraction caused by ulcer. Also, Matsumoto et al.[1] excluded endoscopically staged submucosal invasion, which may have excluded massive submucosal invasion. Accordingly, the classification of Matsumoto et al. could have a role in the detection of slight invasion of the submucosa; if the classification is useful for the detection of slight invasion of the submucosa, the classification may be valuable. On the other hand, Matsumoto et al. used a 20-MHz catheter-type probe, which may delineate other factors that could make it difficult to diagnose submucosal invasion. Kida et al.[5] compared the accuracy rates with ordinary EUS and EUS with a catheter-type probe; the rates were 90% and 92%, respectively, for mucosal cancer, and 69.7% and 82%, respectively, for cancer invading the submucosa. They reported that the accuracy for type I and III patterns was lower with the catheter-type probe than with conventional EUS, because of attenuation. In the article by Matsumoto et al.,[1] they classified the type as unclear if it may have been caused by attenuation. Therefore protruding or elevated lesions should be determined by conventional EUS or with a lower-frequency probe. Nakamura et al.[7] compared the accuracy of X-ray, endoscopy, and EUS for determination of the depth of cancer invasion. The accuracy for determination of mucosal cancer without ulcer or ulcer scar was 86% for X-ray, 84% for endoscopy, and 77% for EUS. The accuracy for determination of cancer invading the submucosa without ulcer was 58% for X-ray, 55% for endoscopy, and 85% for EUS. Among these three modalities, EUS had the best accuracy for determination of submucosal inva-

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sion. In the report of Matsumoto et al.,[1] the accuracy of endoscopic diagnosis of mucosal cancer was 80%, similar to that of Nakamura et al.[7]

Recently, several authors have suggested that the indications for endoscopic resection should be extended. Tada et al.[8] stated that the indications for endoscopic mucosal resection were limited to well differentiated adenocarcinoma within the mucosa, less than 2 cm in diameter, without ulcerous change. However, Ohshiba et al.[9] reported that the indications for curative endoscopic resection could be extended to well differentiated mucosal cancer (type IIa + IIc, IIb, IIc) without ulcer, less than 30 mm in diameter; and poorly differentiated mucosal cancer (type IIb without ulcer) less than 30 mm in diameter, based on analysis of the resected specimen. Fujizaki et al.[10] reported that well differentiated cancer without ulcer, less than 20 mm in diameter, slightly invading the submucosa (less than 150–200 Ém below the muscularis mucosae) with no lymph node metastasis, based on histological examination of the resected specimen, and they reported that endoscopic mucosal resection could be extended to these cases. However, for the reasons given above, the diagnosis of slight invasion of the submucosa is still difficult, and accuracy is lower than that for deeper invasion.

This article could be important in describing slight invasion of the submucosa. If the authors would study the relationship between EUS types and histological invasion, it could be even more useful.

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