

Pitfalls in Assessing the Depth of Invasion in Colorectal Neoplasia

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Endoscopic removal of colorectal neoplasm is a safe and an effective treatment in reducing colorectal cancer (CRC) related incidence and mortality [1,2]. Recent progress in endoscopic techniques such as endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD) have enable endoscopists to expand these treatments to early colorectal cancers [3,4]. At present, colorectal neoplasms either confined to the mucosa or superficial submucosal (SM) invasion less than 1000 μ m are indicated for endoscopic treatment. Deep SM cancer over 1000 μ m invasion is not indicated for endoscopic treatment due to the high risk of lymph node metastasis with 6.9 - 22.2% [5,6]. Therefore, the precise assessment of the depth of invasion in colorectal neoplasms is crucial to decide an accurate therapeutic option. Recently, Utsumi et al. proposed three-step strategy for management of colorectal neoplasia [7]. The authors suggested sequential examinations of white light colonoscopy, narrow band imaging (NBI), and magnifying chromoendoscopy (MCE) to define deep SM cancers for surgery.

Even though recent development of hardware, we should keep in mind that the first step is morphological examination using white light colonoscopy. In this point of view, size is one of the most important indicators. A previous study reported that 7.4 - 14% of colorectal polyps larger than 20 mm contained SM carcinoma and the incidence of invasive SM carcinomas increased in proportion to the tumor size [8,9]. Other morphological features, such as loss of lobulation, excavation, demarcated depressed areas, stalk swelling, fullness, fold convergence, and bleeding ulcers are strongly suggestive to deep SM cancer [10,11]. Thus, endoscopists should carefully examine polyps larger than 20 mm to avoid unnecessary endoscopic treatment. Recent our study showed that experienced endoscopist could predict deep SM cancer with 92.9% of a diagnostic accuracy in flat and sessile colorectal neoplasia larger than 20mm using white light and high definition colonoscopy [10]. However, although polyps less than 20 mm have only 0.07-5.80% of submucosal carcinoma [5], morphological assessment is much harder in small polyps than large polyps. Our study showed that endoscopists could detect deep SM cancer with only 71% of a diagnostic accuracy using invasive morphological features in polyps less than 20 mm [11]. Thus, 68% of patients with deep SM cancer of small polyps were initially under-treated. Because adenomas or superficial SM cancers are readily lifted by SM injection, non-lifting sign is another indicator for deep SM cancer. A previous study showed that the accuracy of non-lifting signs for deep SM cancers was 94.8% [12]. However, in small polyps, the diagnostic accuracy of non-lifting sign falls to 75% [11]. Therefore, although the prevalence of SM cancer is very low in small polyps, further diagnostic strategy is mandatory to avoid unnecessary cost and complications according to inappropriate endoscopic treatment.

Magnifying NBI is an endoscopic imaging technique that emphasizes superficial mucosal microvascular architecture [13,14]. There have been several endoscopic classification systems for the assessment of depth of invasion with NBI. In the Hiroshima classification, over 95% of type C3 lesions are deep SM cancers with 100% of specificity [13]. In the Sano's classification, the accuracy, sensitivity, and specificity of capillary pattern type IIIB for deep SM cancer are 87.7%, 84.8%, and 88.7%, respectively [15]. Without magnification, NBI International Colorectal Endoscopic

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(NICE) classification can be applied and one of three criteria (color, vessels, surface pattern) of deep SM cancer showed the sensitivity of 94.9% and the negative predictive value of 95.9% [16]. Because the diagnostic accuracy of NBI is generally lower than MCE, the polyps should be examined using MCE when SM cancer is suspected in NBI. MCE is an endoscopic technique that observes the microarchitecture of pits, epithelial crests or ridges at the surface of the colonic mucosa [5]. Kudo's classification of type V pit pattern is usually considered to be invasive SM and type VN is strongly suggestive of deep SM cancer with accuracy 98.8%, sensitivity 85.6%, specificity 99.4% [17,18].

It is definite that magnifying NBI or MCE significantly increases the diagnostic accuracy for assessing SM cancer. However, our recent study showed that there was only subtle increase in diagnostic accuracy from 92.9% to 95.3% when morphological evaluation was combined with NBI or MCE in polyps larger than 20 mm [10]. This discrepancy in especially large flat and sessile tumors is due to a focal deep SM invasion with a main superficial lesion. Thus, the focal deep SM invasion could be easily hidden by tumor. Therefore, experience and careful examination for whole lesion should be carried out to exclude a focal deep SM lesion in large colorectal neoplasia.

Precise and careful examination of polyps is the first step to decide a proper treatment. If the polyp is suspicious to SM cancer, NBI and MCE are definitely helpful to further define the depth of invasion. Especially, even though low prevalence of SM cancer, endoscopist should be familiar with the invasive morphological features in small polyps. With these efforts, we can reduce unnecessary cost and complications of endoscopic treatment.

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