Can transrectal ultrasound-guided core needle biopsy serve as an accurate diagnostic tool for rectal lesions?

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Colorectal cancer (CRC) is one of the most common cancers and the leading cause of cancer-related deaths worldwide. The widespread use of colonoscopy in recent times has improved the CRC detection rate; approximately 70% of CRCs involves the colon and 30% affects the rectum (1). Endoscopic or surgical resection is essential for confirmation of submucosal (SM) invasion following the diagnosis of rectal cancer. Adenocarcinoma is the most common histopathological type of rectal cancer; however, squamous cell carcinoma, mucinous adenocarcinoma, or neuroendocrine tumor may also occur in the rectum. Treatment and prognosis vary significantly based on the histopathological type of the tumor. The rectum shares limited space with other genitourinary organs, blood vessels, and nerves in the pelvic cavity; therefore, ensuring curative resection of rectal cancer without intraoperative injury to surrounding organs is challenging (2). Consequently, accurate diagnosis of the extent of SM invasion is important to select an optimal treatment modality for rectal cancer.

Early CRC is defined as carcinoma in which tumor invasion is limited to the mucosa or submucosa, regardless of lymph node metastasis (LNM) (3). In contrast to early gastric cancer, early CRC confined to the epithelium or the lamina propria mucosae shows virtually no risk of metastasis because lymphatic and blood vessels are absent in the epithelium and the lamina propria mucosae (4). Endoscopic resection serves as curative therapy in cases of benign adenoma and intramucosal carcinoma (Tis) [corresponding to high-grade intraepithelial neoplasia [HGIN] in western

countries] (5-7). Endoscopic resection is indicated for lesions with little risk of LNM (T1 cancer with SM invasion depth <1,000 μm) in patients with tumors that invade the muscularis mucosae and spread to the submucosa. Surgery should be recommended as radical treatment for CRC categorized as T1b cancers (T1 cancer with SM invasion depth ≥1,000 μm) owing to the high risk of LNM (10%) (8-11). Therefore, it is important for endoscopists to determine the extent of SM invasion before endoscopic treatment to identify patients in whom endoscopic resection alone can achieve complete cure.

In the current issue, Liu *et al.* (12) first reported the safety and feasibility of transrectal ultrasound (TRUS)-guided core needle biopsy (CNB) for rectal lesions. The authors retrospectively investigated 102 patients with rectal lesions who underwent endoscopic forceps biopsy (EFB) and TRUS-guided CNB prior to surgery. Compared with postoperative pathology findings, the histopathological diagnostic discrepancy rates of EFB and TRUS-guided CNB were 51.0% (52/102 lesions) and 8.8% (9/102 lesions), respectively; the kappa value for consistency with postoperative pathology findings was 0.420 for EFB and 0.876 for TRUS-guided CNB. These data suggest that consistency with postoperative pathology findings was better with TRUS-guided CNB than with EFB. Notably, TRUS-guided CNB was more useful to diagnose relatively rare types of malignancies (e.g., squamous cell carcinoma or mucinous adenocarcinoma), as well as benign lesions (e.g., endometriosis). Additionally, the authors described

characteristic contributors to histopathological discrepancies between EFB and postoperative pathology findings; multivariate analysis showed that flat/depressed lesions and those with thickness ≥13.5 mm were significantly associated with histopathological discrepancies in EFB.

EFB is a standard technique to diagnose rectal cancers; however, it may not be suitable for optimal evaluation of SM invasion because it has been observed that invasive cancers can be confirmed only in 58.7–67.3% of rectal tissue samples obtained by EFB prior to surgery (13). Rebiopsy may increase the detection rate of SM invasion; however, this approach may lead to diagnostic delays. Furthermore, even in patients with HGIN diagnosed by EFB, postoperative pathology findings may reveal cancers with invasion of the SM or deeper layers (14). In that TRUS-guided CNB can harvest the five-layer structure of the rectal wall, Liu *et al.* also reported that SM invasion was observed only in 61.8% of patients undergoing EFB and in 85% of patients undergoing TRUS-guided CNB (12).

There is much interest across the medical community regarding other potential diagnostic methods to predict SM invasion in rectal cancer. It is known that flat/depressed lesions observed on conventional colonoscopy are associated with a higher risk of deep SM invasion (15,16). The desmoplastic reaction associated with CRC is another useful histopathological predictor of SM invasion (17,18). However, the accuracy of conventional colonoscopy in predicting SM invasion is limited to approximately 70–80% (19,20). In contrast, the use of magnifying colonoscopy improves the discrimination rate of SM invasion to as high as 97% on the basis of identification of the Vn type pit pattern (21). Endoscopic ultrasonography (EUS) can predict SM invasion in early CRC (accuracy rate 93%) with a high positive predictive value for deep SM invasion (22). However, conflicting data are available regarding the utility of EUS and magnifying colonoscopy for the management of CRC. Two studies that compared EUS with magnifying colonoscopy reported that EUS was superior to magnifying chromoendoscopy to determine the depth of tumor invasion [93% *vs.* 59% (22), and 93% *vs.* 63% (23)]. Interestingly, another study that investigated the diagnostic accuracy of magnifying colonoscopy and EUS in determining the depth of tumor invasion reported no differences between these modalities, particularly for non-polypoid lesions (85% *vs.* 79%, P=0.717) (24).

Notably, the study reported by Liu *et al.* is a single-center retrospective study; therefore, a selection bias might have been introduced owing to the fact that patients enrolled might not have been consecutive cases. This would be a limitation of this research. Recently, endoscopic submucosal dissection (ESD) is used for accurate diagnosis and treatment of superficial colorectal lesions and subepithelial tumors. In this study, unnecessary surgery was performed on 8 adenomas, 8 HGINs, and 17 benign lesions. In the era of EUS, magnifying colonoscopy, and ESD, clinicians must weigh the risk-benefit ratio of TRUS-guided CNB *vs.* the aforementioned modalities to predict SM cancer and the histopathological characteristics of subepithelial tumors. Nevertheless, the authors proved that TRUS-guided CNB could be a useful option for accurate preoperative diagnosis of rectal lesions. Prospective comparative studies are warranted in the future to compare TRUS-guided CNB with currently available modalities such as EUS, magnifying colonoscopy, and diagnostic ESD.

Acknowledgments

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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