

Rectal ESD after prior endoscopic intervention: the impact of submucosal fibrosis on procedural success

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Dear Editor,

Endoscopic submucosal dissection (ESD) has become an important organ-preserving treatment option for large superficial rectal neoplasms, particularly laterally spreading tumors (LSTs) and lesions with suspected superficial submucosal invasion. Compared with conventional endoscopic mucosal resection (EMR), ESD provides higher en bloc and R0 resection rates, allowing accurate histopathological evaluation and reducing local recurrence risk. However, despite its clinical advantages, rectal ESD remains technically demanding, and submucosal fibrosis represents one of the most important factors limiting procedural success.¹

Submucosal fibrosis results in loss of the natural dissection plane, reduced tissue mobility, prolonged procedure time, and increased risk of perforation. Fibrosis severity is commonly classified using the F0-F2 system: F0 indicates no fibrosis, F1 represents mild fibrosis with a white web-like appearance, and F2 indicates severe fibrosis with dense scar formation and loss of the normal submucosal layer. Severe fibrosis (F2) has been associated with lower en bloc resection rates, increased procedural difficulty, and higher risk of adverse events. In fibrotic lesions, the non-lifting sign (failure of adequate lesion elevation after submucosal injection) further compromises safe dissection by narrowing the available submucosal working space.²

An important consideration is that submucosal fibrosis may not solely reflect the biological characteristics of the lesion itself. Previous endoscopic interventions, including repeated forceps biopsies, incomplete resections, and inappropriate tattoo placement, may contribute to fibrosis formation and increase the technical difficulty of subsequent ESD. Although a direct causal relationship has not been definitively established for all interventions, previous manipulation of the submucosal layer has been associated with increased fibrosis and challenging dissection conditions.³ Therefore, unnecessary interventions before referral for definitive treatment should be avoided whenever ESD is being considered.

Tattooing technique deserves particular attention in this context. While tattooing can be valuable for lesion localization, direct injection of tattoo material beneath the lesion may compromise the submucosal plane and complicate subsequent dissection. When marking is necessary, tattoo placement approximately 3-4 cm distal to the lesion using small-volume injections in multiple quadrants is preferred to facilitate localization while minimizing interference with the future dissection field.⁴

The clinical impact of fibrosis has been demonstrated in several colorectal ESD studies. In their multicenter study involving 2,423 consecutive patients undergoing colorectal ESD across 11 centers, Kamigaichi et al.⁵ identified severe submucosal fibrosis as an independent risk factor for incomplete or interrupted procedures, reduced procedural success, and procedure-related complications. These findings highlight that fibrosis is not merely a technical inconvenience but a major determinant of procedural outcomes. This issue is particularly relevant in rectal ESD, where limited working space and restricted endoscope maneuverability can further magnify the challenges associated with dense fibrosis.

Current guidelines emphasize the importance of preserving the submucosal layer before definitive resection. The European Society of Gastrointestinal Endoscopy (ESGE) recommends high-quality optical diagnosis rather than routine biopsy for lesions that may require advanced endoscopic resection and supports referral to expert centers for large lesions, technically challenging locations, or cases with previous unsuccessful intervention.⁴ Accordingly, a lesion considered for rectal ESD should ideally reach the expert center without unnecessary disruption of the submucosal plane.

Recent technical developments, including traction-assisted ESD and the pocket-creation method, have expanded the therapeutic options for difficult fibrotic lesions by improving visualization and maintaining a stable dissection field. However, these techniques should be considered strategies to

overcome established fibrosis rather than methods to prevent its development. Therefore, appropriate lesion management before referral remains a fundamental component of successful ESD.^{5,6}

In practical terms, large rectal lesions (particularly those ≥ 40 mm), lesions located near the anorectal junction, non-lifting lesions, or lesions previously subjected to biopsy, partial resection, or inappropriate tattooing should prompt early referral to experienced ESD centers. Avoiding unnecessary manipulation and preserving the native submucosal plane may increase the likelihood of en bloc R0 resection and reduce procedure-related morbidity.⁴⁻⁶

In conclusion, the outcome of rectal ESD depends not only on dissection technique but also on decisions made before the procedure begins. Preventing avoidable submucosal fibrosis through appropriate diagnostic assessment, careful tattooing practices, and timely referral may be as important as technical expertise during ESD itself.

ETHICAL DECLARATIONS

Peer Review Process

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Conflict of Interest

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Author Contributions

The author is solely responsible for the entirety of conception, execution, analysis, and writing of the manuscript.

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