EDITORIAL

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There is no royal road: a shortcut for endoscopic submucosal dissection training

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See "Usefulness of a new polyvinyl alcohol hydrogel (PVA-H)-based simulator for endoscopic submucosal dissection training: a pilot study" by Dong Seok Lee, Gin Hyug Lee, Sang Gyun Kim, et al., Clin Endosc 2023;56:604–612.

Endoscopic submucosal dissection (ESD) technique has gained popularity and has been adopted for various procedures such as endoscopic myotomy or third space endoscopy for the treatment of gastrointestinal diseases.[1] A major concern regarding the widespread use of ESD technique is that the "Master-Apprentice process" is still a basic step for familiarizing with this procedure. This apprenticeship-based training method is highly beneficial for endoscopic training and remains the cornerstone of the gastrointestinal endoscopy training method.[2]

However, there have been many attempts at systematic training for endoscopy.[3] ESD was similarly addressed as these general endoscopic training systems. The old-fashioned teaching by expert to trainee was from "just observation" to "practice to patient under supervision by expert".[4] In addition, we had several options for trainees such as hand-made self-developed kits,[5] *ex vivo* stomach of pig,[6] commercialized ESD kit, and in vivo porcine model.[7] However, these models are challenging to implement for effective training and teaching in each center because of several issues including cost, facilities, and differences from human organs. It is noteworthy that direct procedures on patients without sufficient training could impact treatment outcomes and patient safety.

In this issue of *Clinical Endoscopy*, Lee et al.[8] reported a pilot study on the usefulness of a new polyvinyl alcohol hydrogel-based simulator for ESD training. They compared a new ESD simulator with a previous ESD simulator. Eight expert endoscopists from 3 different centers conducted ESD procedures on both models and analyzed procedure-related factors of the simulators. The new simulator had several benefits, which included permitting better marking of the target lesion's limits ($p<0.001$) and overall handling ($p<0.001$). A total of 5 trainees performed gastric ESD drilling under the guidance of experts; the complete resection rate improved after 3 ESD training sessions (9 procedures), and the perforation rate decreased after 4 sessions (12 procedures). They concluded that the new ESD simulator helps beginners to achieve a high level of technical experience before they perform real-time ESD procedures in patients. Although the new simulator was constructed with the same material or ingredients as previous simulators, the new one had several advantages in terms of compatibility with other endoscopic equipment, handling of the endoscope, number of ESD times per kit, and cost. However, the authors noted that this material could not satisfactorily mold elevated or depressed lesions and preservation. Regarding endoscopic procedures, there were also several limitations such as the management of

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complications including bleeding and perforation, ensuring good visibility of the submucosal layer using gravity, and control of air with insufflation and suction during the procedure.

Despite these limitations, such attempts, not only in ESD training but also in other procedures like endoscopic retrograde cholangiopancreatography,[9] are important for the future development of training kits and improving availability. However, there might be some hurdles to enter the market or for widespread use. There are various unmet needs regarding simulators for ESD, such as bleeding during procedures or unrealistic tactile presentation. These are important in real procedures and for drilling ESD techniques. Moreso, we must consider manipulability and the feeling of easiness for successful launching as a stimulator. These are challenging to quantify by objective variables; hence, subjectivity would be one limitation for comparable outcomes. Nonetheless, we can anticipate better simulators for difficult procedures to overcome the learning curve and implement them better on patients. Although there is no royal road, many trials and errors have been made to find a shortcut.

Conflicts of Interest

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