

EDITORIAL

Towards achieving mastery in advanced endoscopic procedures: Standardized training programs and improved endoscopic systems

The recent decades have seen procedurists increasingly using the endoscope to perform advanced endoscopic procedures. These therapeutic procedures include endoscopic submucosal dissection (ESD) for early gastrointestinal tract cancers, endoscopic full thickness resection (EFTR) for tumors infiltrating into the muscularis propria, and peroral endoscopic myotomy (POEM) for achalasia. If performed well, these procedures can lead to improved clinical outcomes and enhanced recovery for patients.

Nevertheless, these procedures are extremely complex and are often fraught with high complication rates of uncontrolled bleeding and perforation. To compound to the intrinsic complexity of these procedures, the patient caseload for these conditions is very low in many centers around the world, making it even more challenging for procedurists to perfect their techniques. In addition, current endoscopic systems are non-dexterous, rendering it technically challenging to achieve triangulation of instruments to perform precise maneuvers.¹ As a result, procedurists are faced with a long learning curve before they can become proficient in these advanced endoscopic procedures. It then becomes apparent that a properly crafted training system and an enhanced endoscopic system with improved dexterity will hugely benefit procedurists by shortening the learning curves required for mastering complex endoscopic procedures.

Training systems around the world

East Asia. In Japan, where the practice of ESD first originated because of the high incidence of early gastric cancer, much work has been put it to investigate the type of training required for a trainee to obtain proficiency in advanced endoscopic procedures.

In terms of the volume of cases required to obtain proficiency, Kakushima et al. noted that Japanese experts recommend training with at least 50–100 cases of gastric ESD.² Prior to that, trainees should perform at least 30 gastric ESD cases under the supervision of an expert to learn basic techniques in ESD.³ Oda et al. also noted that observing and attending ESD cases as an assistant can help the trainee gain invaluable trouble-shooting skills should complications arise during the ESD procedure.⁴ Regarding the type of cases that should be attempted during the training stages, Goda et al. recommended that the trainee commences with non-ulcerated antral lesions smaller than 20 mm in diameter, as these lesions have the lowest risks of noncurative resection.⁵ Subsequently, the trainee can then progress to ESD for lesions in the distal and proximal stomach, which are more technically demanding. Interestingly, Hirasawa et al. demonstrated that the risk of perforation is not significantly associated

with years of prior endoscopic experience, number of endoscopic procedures per year, and prior experience with endoscopic retrograde cholangiopancreatography.⁶

Southeast Asia. In Southeast Asia, however, the incidence of early gastric cancer is lower than in Japan. That unfortunately translates to less opportunities for endoscopists to master their techniques for complex endoscopic procedures. As a result, unlike in Japan where young endoscopists can embark on ESD after adequate training, endoscopists in Southeast Asia accumulate significant amounts of endoscopic experience and perform endoscopic mucosal resections (EMR) prior to embarking on ESD. In the study conducted by Azmi et al.,⁷ all endoscopists had performed EMR previously before embarking on ESD, all endoscopists had completed animal model training for ESD, and three endoscopists underwent further training in Japan.

In this issue of *JGH Open*, Ho et al.⁸ described how the lack of training opportunities hindered the initial development of POEM in Malaysia. After acquiring the necessary endoscopic skills through further training with international experts, the POEM service in Malaysia was subsequently set up. Ho et al. then identified three prerequisites required for the establishment of a successful POEM service: first, endoscopists' prior experience in performing ESD; second, availability of surgical expertise; and third, availability of anesthetic support. Experience in ESD and third space dissection significantly increases endoscopists' confidence and ability in performing myotomy during POEM. Availability of surgical expertise then alleviates the fear of the procedurists should they face unfamiliar mediastinal anatomy or complications. Finally, availability of anesthetic support allows POEM to be performed efficiently under general anesthesia in the endoscopic suite.

North America. In Canada, the rate of early gastric cancer is even lower than in Southeast Asia. Consequently, ESD is used primarily for colorectal and Barrett's associated cancer rather than for early gastric cancer.

In this issue of *JGH Open*, Mandip et al.⁹ examined Canadian clinicians' training, practice, obstacles in implementation, and perceptions of the future of ESD in Canada. In this study, the highest ranked barriers to adoption of ESD in Canada were long procedural times and lack of formalized training. Thirty-eight percent of the respondents did not have further formal ESD training, and for those who pursued ESD training, 42% had less than 3 months of ESD training.

These findings reinforce the pressing need for training of complex endoscopic procedures to be enhanced internationally. Training should also be optimized to cater to the unique needs of individual endoscopists. In countries where caseloads are low, more effort should be placed into providing high-quality animal model training for endoscopists. Endoscopists should also consider pursuing further formal training in international centers with high volumes.

Innovative endoscopic systems to shorten learning curve for complex endoscopic procedures


Despite the best attempts of experts to institute a standardized ESD training system, these efforts will remain challenging if endoscopic systems are not enhanced in tandem to improve its dexterity. Recently, several endoscopic innovations have emerged in the hope of surmounting the obstacles of poor dexterity and inability to achieve triangulation. One such promising innovation is the flexible endoscopic robotic platform.

In a prospective study conducted by Chiu *et al.* comparing ESD using the Master and Slave TransEndoluminal Robot (MASTER) (Endomaster Pte. Ltd., Singapore) for individuals with and without experience in endoscopy and surgery,¹⁰ the use of MASTER allowed novices without endoscopic experience to complete ESD. This suggests that MASTER reduces the learning curve for procedurists performing complex endoscopic procedures.

The reduction in learning curve using robotic assistance is also supported by a randomized controlled pilot study conducted by Turiani Hourmeaux de Moura *et al.*¹¹ In this study, endoscopists without prior ESD experience performed conventional ESD and robot-assisted ESD (RESD) using the Flex Robotic System for colorectal lesions. When RESD was performed, the complete en bloc resection rate was 100%, as compared to only 50% in conventional ESD procedures. In addition, for the RESD group, perforation rate was lower, total procedure time was shorter, and dissection time was reduced.

With a learning curve that is not as steep, procedurists may then find ESD to be less technically challenging, and can potentially complete ESD in a shorter time with lower complication rates of uncontrolled bleeding and perforation.

In conclusion, to achieve the best patient outcomes, it is paramount that endoscopists performing complex therapeutic procedures come together to create an effective training system for procedurists. At the same time, current endoscopic systems must be enhanced to provide improved dexterity in the end-effectors for endoscopists to achieve triangulation of instruments.

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