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Endoscopic Submucosal Dissection (ESD) Training and Performing ESD with Accurate and Safe Techniques

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Introduction of endoscopic submucosal dissection (ESD) has brought about a renaissance in therapeutic endoscopy. For the globalization and universalization of ESD, the number of physicians who can perform ESD has rapidly increased with general *ex vivo* and *in vivo* training using animal models and hand-on courses. In this focused review series, world-renowned ESD experts described the published studies or their own precious experiences about ESD training and performing ESD with accurate and safe techniques. First, Dr. Adolfo Parra-Blanco reviewed on *ex vivo* and *in vivo* models for ESD training. Next, Dr. Joo Young Cho described detailed practical settings and current status of hands-on courses using *ex vivo* and *in vivo* models in Korea. Dr. Takashi Toyonaga described quality controlled ESD and basic techniques to prevent complications. Dr. Tsuneo Oyama reviewed recently published methods to facilitate ESD. Dr. Jae-Young Jang reviewed the usefulness of magnifying and narrow band imaging to measure the depth of invasion before ESD.

Key Words: Endoscopic submucosal dissection; Animal models; Training; Globalization; Universalization

INTRODUCTION

With the beginning of new millennium, while stem cell has been the major issue of the basic medicine, endoscopic submucosal dissection (ESD) has brought about a renaissance in therapeutic endoscopy. The procedures that had been performed only by a few pioneers in Japan are now, 10 years later, easily accessible at most large centers in Japan and Korea, and rapidly spreading in the East Asia, Europe, and the USA. Such rapid growth of ESD may be probably explained by the possibility of complete resection (R0) regardless of the tumor size in the gastrointestinal tract^{1,2} and rapid increase of candidate patients due to the improvement in early detection of tumor. ESD will be the first to be mentioned if there were a Noble prize for endoscopy. With the development and improvement of therapeutic techniques and various specialized devices, procedures aimed at gastric tumor are now performed for tr-

eatment of esophageal and colorectal tumors.³⁻⁸ Furthermore, the number of physicians who can perform ESD has rapidly increased with general *ex vivo* and *in vivo* training using animal models and hand-on courses;⁹⁻¹¹ ESD, that were performed only in Japan and Korea, is now going through globalization and universalization.¹²⁻¹⁴

Several questions may be raised at this point. Is it really possible to globalize and universalize ESD within the next decade? What kind of efforts is required to make it possible? What are the new diseases that ESD technique could be applied in the next decade? These questions are of much concern not only to me but also to many of those who are performing or willing to perform ESD, and the focused reviews on the globalization of ESD has been planned, in this regard, through the editors meeting of *Clinical Endoscopy*. World-renowned ESD experts each introduced two distinct major themes on ESD by reviewing the published studies or their own precious experiences.

ESD TRAINING

In fact, ESD procedure requires more complicated and accurate techniques than other procedures in the field of therapeutic endoscopy, which is why it is more difficult to learn. In order to attain the stage of performing the procedure in pa-

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tients, clinicians need to observe more procedures by experts and participate in individualized one on one training using training models. This review is aimed at introducing published articles so far on ESD training using training models and providing an overview on how ESD training has been performed in reality.

First, Dr. Adolfo Parra-Blanco reviewed on *ex vivo* and *in vivo* models for ESD training. He reviewed and clearly summarized studies on ESD training published so far, showing that training with animal model is actually very helpful. He also provided detailed description on what efforts have been made to learn ESD in countries without experts on ESD and how original *ex vivo* model for ESD training was made.

Second, Dr. Joo Young Cho described detailed practical settings and current status of hands-on courses using *ex vivo* and *in vivo* models in Korea to encourage enforcement of ESD training. He explained how ESD training has been performed in practice and what efforts have been made in Korea for globalization and universalization of ESD.

Readers of these perfect and remarkable focused reviews will exclaim "This is it!" and will be able to make an *ex vivo* model effortlessly. This focused review series would be of great value if it could be of any help in developing ESD training around the world.

PERFORMING ESD WITH ACCURATE AND SAFE TECHNIQUES

Methods to perform ESD more easily and accurately and to maximize ESD were discussed. ESD technique has become easier and more convenient with the development of various knives, devices, injection fluids, and electro-surgical units for ESD, which may be useful to prevent complications and enhance the safety of ESD when used properly.

First, quality controlled ESD and basic techniques to prevent complications were described by Dr. Takashi Toyonaga. Beyond the conventional wisdom that ESD should be performed in a short period of time, the author explains the importance of quality controlled ESD for preventing complications and what should be done for this purpose, citing fantastic figures.

Second, Dr. Tsuneo Oyama reviewed recently published methods to facilitate ESD, such as position change, clip with line method, external grasping forceps method, and internal traction method. All these methods are very helpful in executing ESD in difficult cases or positions.

Third, Dr. Jae-Young Jang reviewed the usefulness of magnifying and narrow band imaging (NBI) to measure the depth of invasion before ESD, which is one of the recent hot issues. This review explained how magnifying and NBI can be used

to avoid performing incomplete ESD of a lesion and to predict when not to perform it.

EPILOGUE

ESD has been an ambition for me since first encountering it 10 years ago, and planning these focused review series was a great honor to me. Ten years ago, my first question was 'Will I be able to perform ESD?' I hope this focused review series will be of help to the readers of *Clinical Endoscopy* and inspire some confidence that they could also learn and perform ESD.

Conflicts of Interest

The author has no financial conflicts of interest.

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