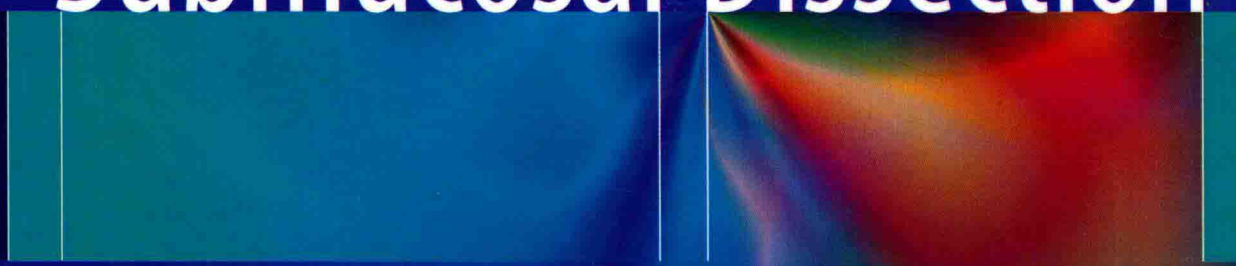
Norio Fukami
Editor

Endoscopic Submucosal Dissection

Principles and Practice



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Norio Fukami, MD, AGAF, FACG, FASGE
Division of Gastroenterology & Hepatology
University of Colorado Anschutz Medical Campus
Aurora, CO, USA

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Foreword

It was 1996 when I and my colleagues, the Endoscopy Group at the National Cancer Center Hospital, Tokyo, Japan, first developed and used the IT knife in endoscopic submucosal dissection (ESD) for early gastric cancer, and it is unbelievable how fast almost two decades have passed since then. Because surgical treatment, such as esophagectomy, gastrectomy, and colectomy, deteriorate patient condition despite clinical benefit, and because ESD obtains undoubtedly much better quality of life with comparable outcome, ESD has been widely accepted as a standard treatment for early cancer in the gastrointestinal tract and has rapidly spread throughout not only Japan but also many East Asian countries.

We know that doctors in Western countries have seen and experienced not many early-stage cancers or superficial lesions of the GI tract, and because those lesions were not in the majority, they have not provoked physicians' interest. However, I think the situation is changing by a certain degree, and I feel more enthusiasm from Western countries as well.

Successful ESD requires sound surgical skills, aptitude for early tumor detection and accurate assessment and diagnosis of tumor extension and depth, and knowledge about treatment indications. ESD has contributed to the development of more advanced diagnostic procedures using NBI with magnifying endoscopy, and has led to the start of many prospective clinical trials. Furthermore, on the basis of ESD, the endoscopist's work has expanded extensively to cover even peroral endoscopic myotomy (POEM), laparoscopy and endoscopy cooperative surgery (LECS), and endoscopic full-thickness resection (EFTR). Yet, we continue to make ceaseless efforts to push to more new frontiers.

Dr. Fukami, the editor, has worked in both Japan and the USA, and, therefore, he keenly feels the necessity for introduction of all aspects of ESD to Western doctors. Many pioneers and experts of ESD approved of his appeal and contributed to it. I believe this textbook will be a great help to both Eastern and Western endoscopists wanting to create new frontiers. Join us and together let us open up new possibilities for endoscopic therapy.

Hiroyuki Ono, M.D., Ph.D.
Shizuoka Cancer Center
Shizuoka, Japan

Preface

Endoscopic submucosal dissection (ESD) was born in Japan in the 1990s with much enthusiasm to overcome the shortcomings of endoscopic treatment for early gastric cancer. Then, many dedicated physicians explored the expansion of this technique to treat an even wider array of mucosal diseases in the gastrointestinal tract. I was lucky to see the early stages of the ESD procedure in Japan, following its evolution to the established ESD procedure that is now perceived as exceptionally elegant, intricate, and effective in carefully selected patients providing cure from cancer without invasive surgery. ESD has evolved to become a much safer and more capable mucosal resection technique, and has now expanded to treat even submucosal tumors (such as stromal tumors) and also into achalasia treatment (POEM).

ESD spread easily to neighboring countries, for they shared the similar disease prevalence of gastric cancer, but it has taken more time to come to Western countries. Early adaptors of ESD from the Western world learned by hands-on training in Japan or with explant models supervised and trained by ESD experts. Literature on outcome and some techniques is available, but we have limited resources for learning ESD in English.

There was a desperate need for an ESD textbook to teach the much-needed basics for learning and performing ESD, from diagnosis of mucosal disease by evaluation with advanced imaging to understanding the indications and limitations of endoscopic treatment, the actual procedural steps, including tips and tricks, to coping with complications, and how to follow up patients after ESD.

It has been an exceptional privilege, pleasure, and an honor to work with worldwide experts in the field to create this first English textbook for ESD.

I truly hope everyone will enjoy this book full of pearls of wisdom shared by the experts so that they may learn safe and effective ESD. This book is dedicated to help all levels of endoscopists who are eager to learn ESD.

I would like to express my respect and deep appreciation to all the exceptional authors who contributed to this book. As well, my gratitude goes to Jacob Gallay and Andy Kwan, who have been dedicated to the success of this first English ESD textbook.

Norio Fukami, M.D.
University of Colorado
Aurora, CO, USA

Contributors

Vitor Arantes Department of Surgery, Alfa Institute, School of Medicine, Minas Gerais Federal University, Belo Horizonte, Brazil

Manuel Berzosa Department of Gastroenterology and Hepatology, Mayo Clinic Florida, Jacksonville, FL, USA

Alissa Bults Division of Gastroenterology and Hepatology, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

Amitabh Chak Department of Medicine, Division of Gastroenterology, University Hospitals Case Medical Center, Cleveland, OH, USA

Jun-Hyung Cho Digestive Disease Center, Soonchunhyang University Hospital, Seoul, South Korea

Joo Young Cho Digestive Disease Center, Soonchunhyang University Hospital, Seoul, South Korea

Alberto Herreros de Tejada Department of Gastroenterology, IDIPHIM, Puerta de Hierro University Hospital, Universidad Autónoma de Madrid, Madrid, Spain

Andrés Donoso Department of Surgery, School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile

Peter V. Draganov Division of Gastroenterology, Hepatology and Nutrition, University of Florida, Gainesville, FL, USA

Norio Fukami Division of Gastroenterology and Hepatology, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

Mitsuhiro Fujishiro Department of Endoscopy and Endoscopic Surgery, Gastroenterology, The University of Tokyo, Tokyo, Japan

Nicolás González Department of Gastroenterology, Faculty of Medicine, Hospital de Clínicas, Montevideo, Uruguay

Christopher J. Gostout Department of Gastroenterology and Hepatology, Mayo Clinic, Rochester, MN, USA

Takuji Gotoda Department of Gastroenterology and Hepatology, Tokyo Medical University, Tokyo, Japan

Yoshikazu Hayashi Gastroenterology and Endoscopy Center, Jichi Medical University, Shimotsuke, Tochigi, Japan

Haruo Ikeda Digestive Disease Center, Showa University Koto-Toyosu Hospital, Koto-ku, Tokyo, Japan

Masafumi Inomata Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine, Oita, Japan

Haruhiro Inoue Digestive Disease Center, Showa University Koto-Toyosu Hospital, Koto-ku, Tokyo, Japan

Hiroaki Itoh Digestive Disease Center, Showa University Koto-Toyosu Hospital, Koto-ku, Tokyo, Japan

Mahesh Jayanna Endoscopy Unit, Division of Surgery, Lyell McEwin Hospital, Adelaide, SA, Australia

Chad Kawa Department of Gastroenterology, University Hospitals Case Medical Center, Cleveland, OH, USA

Mitsuhiro Kida Department of Gastroenterology, Kitasato University, Sagamihara, Kanagawa, Japan

Seigo Kitano Department of Surgery, Oita University, Oita, Japan

Bong Min Ko Digestive Disease Center, Soonchunhyang University Hospital, Seoul, South Korea

Kazuhiko Koike Department of Gastroenterology, Graduate School of Medicine, The University of Tokyo, Tokyo, Japan

Anja Landowski Endoscopy Unit, Division of Surgery, Lyell McEwin Hospital, Adelaide, SA, Australia

Hang Lak Lee Department of Gastroenterology, Hanyang University College of Medicine, Seoul, South Korea

Keiko Niimi Department of Endoscopy and Endoscopic Surgery, Gastroenterology, The University of Tokyo, Tokyo, Japan

Satoru Nonaka Endoscopy Division, National Cancer Center Hospital, Tokyo, Japan

Ichiro Oda Endoscopy Division, National Cancer Center Hospital, Tokyo, Japan

Takeshi Ohki Institute of Advanced Biomedical Engineering and Science, Institute of Gastroenterology, Department of Surgery, Tokyo Women's Medical University, Tokyo, Japan

Manabu Onimaru Digestive Disease Center, Showa University Koto-Toyosu Hospital, Koto-ku, Tokyo, Japan

Hiroyuki Ono Division of Endoscopy, Shizuoka Cancer Center, Suntogun, Shizuoka, Japan

Tsuneo Oyama Department of Endoscopy, Advanced Care Center, Saku Central Hospital, Nagano, Japan

Adolfo Parra-Blanco Department of Gastroenterology, School of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile

Gottumukkala S. Raju Department of Gastroenterology, Hepatology, and Nutrition, The University of Texas MD Anderson Cancer Center, Houston, TX, USA

Yutaka Saito Endoscopy Division, National Cancer Center Hospital, Tokyo, Japan

Esperanza Grace Santi Digestive Disease Center, Showa University Koto-Toyosu Hospital, Koto-ku, Tokyo, Japan

Ray I. Sarmiento Developmental Endoscopy Unit, Mayo Clinic, Rochester, MN, USA

Sang Yong Seol Department of Gastroenterology, Inje University, Busan, South Korea

Hidefumi Shiroshita Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine, Oita, Japan

Rajvinder Singh Endoscopy Unit, Division of Surgery, Lyell McEwin Hospital, University of Adelaide, Adelaide, SA, Australia

Kazuki Sumiyama Department of Endoscopy, The Jikei University School of Medicine, Tokyo, Japan

Keijiro Sunada Gastroenterology and Endoscopy Center, Jichi Medical University, Shimotsuke, Tochigi, Japan

Hisao Tajiri Division of Gastroenterology and Hepatology, Department of Internal Medicine, The Jikei University School of Medicine, Tokyo, Japan

Department of Endoscopy, The Jikei University School of Medicine, Tokyo, Japan

Manabu Takeuchi Department of Gastroenterology, Niigata University Medical and Dental Hospital, Niigata, Japan

Kohei Takizawa Endoscopy Division, Shizuoka Cancer Center, Shizuoka, Japan

Selvi Thirumurthi Department of Gastroenterology, Hepatology, and Nutrition, The University of Texas MD Anderson Cancer Center, Houston, TX, USA

Takashi Toyonaga Department of Endoscopy, Kobe University Hospital, Kobe, Hyogo, Japan

Michael B. Wallace Department of Gastroenterology and Hepatology, Mayo Clinic Florida, Jacksonville, FL, USA

Naohisa Yahagi Division of Research and Development for Minimally Invasive Treatment, Cancer Center, School of Medicine, Keio University, Shinjuku-ku, Tokyo, Japan

Hironori Yamamoto Gastroenterology and Endoscopy Center, Jichi Medical University, Shimotsuke, Tochigi, Japan

Kazuhiro Yasuda Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine, Oita, Japan

Shigetaka Yoshinaga Endoscopy Division, National Cancer Center Hospital, Tokyo, Japan

List of Abbreviations

AFI	Autofluorescence imaging
APC	Argon plasma coagulation
BE	Barrett's esophagus
CI	Confidence interval
CLE	Confocal laser endomicroscopy
CO_2	Carbon dioxide
CRC	Colorectal cancer
CRP	C-reactive protein
CRT	Chemoradiation therapy
CT	Computed tomography
D50	50 % Dextrose water
DBE	Double-balloon endoscopy
DW	Dextrose water
EBD	Endoscopic balloon dilation
EDSP	Endoscopic double-snare polypectomy
EDTA	Ethylenediaminetetraacetic acid
EEC	Early esophageal cancer
EFTR	Endoscopic full-thickness resection
EGC	Early gastric cancer
EMR	Endoscopic mucosal resection
EP	Epithelium
EPMR	Endoscopic piecemeal resection
ER	Endoscopic resection
ERHSE	Endoscopic resection with hypertonic saline-epinephrine solution
ESD	Endoscopic submucosal dissection
ESMR-L	Endoscopic submucosal resection with ligation device
ESTD	Endoscopic submucosal tunnel dissection
ETI	Endoscopic triamcinolone injection
EUS	Endoscopic ultrasound
FICE	Fujinon intelligent color enhancement
FNA	Fine-needle aspiration
GEJ	Gastroesophageal junction
GI	Gastrointestinal
GIST	Gastrointestinal stromal tumor
H2RA	H2-receptor antagonist

HA	Hyaluronic acid
HDWLE	High-definition white light endoscopy
HGD	High-grade dysplasia
HPMC	Hydroxypropyl methylcellulose
HS	Hypertonic saline
IPCL	Intrapapillary capillary loop
IRB	Institutional review board
IT	Insulated tip
JES	Japan Esophageal Society
JGES	Japan Gastroenterological Endoscopy Society
KCM	Keratinocyte culture medium
LES	Lower esophageal sphincter
LN	Lymph node
LNM	Lymph node metastasis
LP	Lamina propria
LSS	Light-scattering spectroscopy
LST	Laterally spreading tumor
LST-G	Laterally spreading tumor—granular type
LST-NG	Laterally spreading tumor—non-granular type
M	Mucosa(l)
MC	Methylcellulose
ME	Magnification endoscopy
MGC	Metachronous gastric cancer
MRI	Magnetic resonance imaging
NBI	Narrow-band imaging
NET	Neuroendocrine tumor
NOTES	Natural orifice transluminal endoscopic surgery
NS	Normal saline
OCT	Optical coherence tomography
OR	Odds ratio
OTSC	Over-the-scope clip
POEM	Peroral endoscopic myotomy
POET	Peroral endoscopic tumor resection
PPI	Proton pump inhibitor
PVDF	Polyvinylidene difluoride
SCC	Squamous cell carcinoma
SCMC	Sodium carboxymethylcellulose
SFC	Submucosal fluid cushion
SGN	Synchronous gastric neoplasm
SH	Sodium hyaluronate
SLE	Second-look endoscopy
SM	Submucosa(l)
SMI	Submucosal invasion
ST hood	Small-caliber tip hood
STER	Submucosal tunneling endoscopic resection
TTS	Through-the-scope
US	Ultrasonography

Part I

Introduction

Contents

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