

A PRACTICAL MANUAL OF  
**LAPAROSCOPY**  
AND MINIMALLY INVASIVE  
GYNECOLOGY

**A Clinical Cookbook**

**Second Edition**

*Resad P. Pasic, M.D., Ph. D.*  
*Ronald L. Levine, M.D.*



**W**e dedicate this book to the memory of Dr Kurt Semm. All gynecologists who perform laparoscopy owe a great debt to this forward thinking physician. In the 1970s and early 1980s, Dr Semm generated a great deal of controversy as many gynecologists in the United States and in his native Germany refused to accept his ideas on minimally invasive gynecology. Without his contributions, advanced operative laparoscopy could not have progressed to its present state of prominence.

We can directly trace the development of many of the instruments and procedures that we describe in this book to innovative inventions and techniques that Dr Semm pioneered. He not only designed new instruments, but was actively engaged in the manufacturing and distribution of his inventions. His list of inventions and "firsts" is long and important.

- His early magnificent photos and movies set new standards in laparoscopy and became the foundation for several books.
- He developed the first trainer for laparoscopy that he called the "Pelvi Trainer."
- He invented and developed the first electronic insufflators, the morcellator, the endo-coagulator, needle holders, endosuture and the loop ligature among others.
- He performed the first laparoscopic appendectomy and described several innovative operative procedures including such things as the "curling iron" technique of removing an ovarian cyst.

Personally, I will always be thankful for my wonderful experience with Dr Semm in Kiel in 1983. It was a thrill to be in the operating theatre with this giant in our specialty.

It is only fitting that we dedicate this *Manual of Laparoscopy* to the memory of "the father of modern day laparoscopy," Dr Kurt Semm.

© 2007 Informa UK Ltd

First published in the United Kingdom in 2007 by Informa Healthcare, 4 Park Square, Milton Park, Abingdon, Oxon OX14 4RN. Informa Healthcare is a trading division of Informa UK Ltd. Registered Office: 37/41 Mortimer Street, London W1T 3JH. Registered in England and Wales number 1072954.

Tel: +44 (0)20 7017 6000  
Fax: +44 (0)20 7017 6699  
Email: [info.medicine@tandf.co.uk](mailto:info.medicine@tandf.co.uk)  
Website: [www.informahealthcare.com](http://www.informahealthcare.com)

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of the publisher or in accordance with the provisions of the Copyright, Designs and Patents Act 1988 or under the terms of any licence permitting limited copying issued by the Copyright Licensing Agency, 90 Tottenham Court Road, London W1P 0LP.

Although every effort has been made to ensure that all owners of copyright material have been acknowledged in this publication, we would be glad to acknowledge in subsequent reprints or editions any omissions brought to our attention.

A CIP record for this book is available from the British Library.  
Library of Congress Cataloging-in-Publication Data

Data available on application

ISBN-10: 1 84214 330 1  
ISBN-13: 978 1 84214 330 8

Distributed in North and South America by  
Taylor & Francis  
6000 Broken Sound Parkway, NW, (Suite 300)  
Boca Raton, FL 33487, USA

*Within Continental USA*  
Tel: 1 (800) 272 7737; Fax: 1 (800) 374 3401  
*Outside Continental USA*  
Tel: (561) 994 0555; Fax: (561) 361 6018  
Email: [orders@crcpress.com](mailto:orders@crcpress.com)

Distributed in the rest of the world by  
Thomson Publishing Services  
Cheriton House  
North Way  
Andover, Hampshire SP10 5BE, UK  
Tel: +44 (0)1264 332424  
Email: [tps.tandfsalesorder@thomson.com](mailto:tps.tandfsalesorder@thomson.com)

Composition by Scribe Design Ltd, Ashford, Kent, UK  
Printed and bound in India by Replika Press Pvt Ltd

# FOREWORD

With their most recent edition of *A Practical Manual of Laparoscopy: A Clinical Cookbook*, Drs Pasic and Levine present technical innovations, while offering enhanced knowledge, wisdom, and surgical pearls. They augment their prior book with excellent photographs, which, in combination with the vast illustrations and descriptions, help solidify surgical concepts and clarify the related anatomy.

This book is written and edited with the unique insight of two well-respected colleagues. The Senior Editor, Dr Resad Pasic, is an internationally acclaimed expert in advanced endoscopic surgery and has operated with and trained innumerable physicians worldwide. Dr Ronald Levine, considered the “father of American endoscopy,” epitomizes the life-long learner, always seeking new skills, techniques, and approaches. He has educated and mentored literally thousands of surgeons throughout the world. Together they have assembled many of the world’s finest endoscopic surgeons to present their insight, “tricks of the trade,” and share their surgical experience. Their love of laparoscopy exudes from the pages.

In this cookbook, Drs Pasic and Levine present the recipe with which a novice can learn the basics and the expert can tailor, modify, and expand their endoscopic approaches. This book reminds one of the rewards and joy of challenging one’s abilities to achieve new levels of expertise.

JAMES M. SHWAYDER, M.D., J.D.  
University of Louisville



## PREFACE

The first edition of this book was received exceptionally well by both practicing gynecologists and by residents in training. In the first edition, we presented material by eminent laparoscopists in an easy to read format accompanied by digital drawings in order to supply the optimal information to the reader regarding the various procedures.

We have again tried to maintain that format but with the enhancement of colored digital illustrations. We have also added several chapters on newer techniques especially in Urogynecology.

We believe that the information contained in this volume will enhance the skills of the practicing gynecologic surgeon while developing the base for the novice laparoscopists and for all individuals who believe in the concepts of minimally invasive gynecology.

**Resad P Pasic**  
**Ronald L Levine**

---

# **A PRACTICAL MANUAL OF LAPAROSCOPY AND MINIMALLY INVASIVE GYNECOLOGY:**

## **A CLINICAL COOKBOOK SECOND EDITION**

**RESAD P. PASIC, M.D., PhD.**

Associate Professor of Obstetrics, Gynecology & Women's Health  
Director, Section of Operative Gynecologic Endoscopy  
University of Louisville School of Medicine  
Louisville, KY, USA

**RONALD L. LEVINE, M.D.**

Professor of Obstetrics, Gynecology & Women's Health  
University of Louisville School of Medicine  
Louisville, KY, USA

**informa**  
healthcare

---

## ACKNOWLEDGEMENTS

As in previous texts of this “Clinical Cookbook” series, we must first and foremost acknowledge the multiple outstanding gynecologists who have contributed to our chapters. A work such as this can only be meaningful if the contributors are the leaders in endoscopic surgery. We also must thank the many members of industry, whose support has made our work possible:

Boston Scientific, Ltd.  
Ethicon Women’s Health and Urology  
Gyrus ACMI  
I-Flow Corporation  
Karl Storz Endoscopy  
SurgRx, Inc.  
Tyco Healthcare/US Surgical/Valley Lab

We are also thankful for working in the educational environment of the University of Louisville School of Medicine, Department of Obstetrics, Gynecology and Women’s Health. The students, residents and faculty have all been wonderful guides on the difficult path towards better surgical training.

We are indebted to the talents of our illustrator and graphic designer Branko Modrakovic for his creativity and guidance. Producing a book is an extremely difficult task, one that would not be possible without the wisdom and hard work of our editorial assistant, Ms Leta Weedman and our executive assistant, Ms Laura Lukat who have been a continuing source of ideas and patience.

# CONTRIBUTORS

**LEILA V. ADAMYAN, M.D.**

Professor of Obstetrics and Gynecology  
Academician of the Russian Academy  
of Medical Sciences  
Chief of the Department of Operative Gynecology  
Scientific Center for OB/GYN & Perinatology  
Chair of the Department of Reproductive  
Medicine and Surgery  
Moscow State University of Medicine and Dentistry  
Moscow, Russia

**ARNOLD P. ADVINCULA, M.D.**

Assistant Professor  
Department of Obstetrics and Gynecology  
Director of Minimally Invasive Surgery  
Program & Fellowship  
University of Michigan Medical Center  
Ann Arbor, MI, USA

**JEFF W. ALLEN, M.D.**

Associate Professor of Surgery  
University of Louisville School of Medicine  
Louisville, KY, USA

**BERND BOJAHN, M.D.**

Department for Gynaecology and Obstetrics  
University of Greifswald, Germany

**ANDREW I. BRILL, M.D.**

Professor of Obstetrics and Gynecology  
Director, Gynecologic Endoscopy  
The University of Illinois at Chicago  
Chicago, IL, USA

**LAURA CLARK, M.D.**

Associate Professor of Anesthesiology  
University of Louisville School of Medicine  
Louisville, KY, USA

**DEIDRE T. FISHER, M.D.**

Fellow of Advanced Pelvic Surgery  
Atlanta Center for Special Pelvic Surgery  
Atlanta, GA, USA

**ROBERT S. FURR, M.D.**

Fellow of Advanced Gynecologic Endoscopy  
Chattanooga Women's Laser Center  
Chattanooga, TN, USA

**KIRSTEN HALD, M.D.**

Consultant of Gynecology & Obstetrics  
Ullevål University Hospital  
Oslo, Norway

**ERIC M. HEINBERG, M.D., MPH**

Fellow of Advanced Gynecologic Endoscopy  
Obstetrics, Gynecology & Women's Health  
University of Louisville School of Medicine  
Louisville, KY, USA

**C. WILLIAM HELM, M.D.**

Associate Professor of Obstetrics,  
Gynecology & Women's Health  
Director of Gynecologic Oncology  
University of Louisville School of Medicine  
Louisville, KY, USA

**S. PAIGE HERTWECK, M.D.**

Associate Professor of Obstetrics,  
Gynecology & Women's Health  
Director of Pediatric and Adolescent Gynecology  
University of Louisville School of Medicine  
Louisville, KY, USA

**SAM H. HESSAMI, M.D.**

Associate Clinical Professor of Obstetrics  
and Gynecology  
Associate, Urology Specialty Care  
Mount Sinai School of Medicine, New York  
Chief, Division of Urogynecology & Pelvic Surgery  
Hackensack University Hospital and St. Joseph's  
Medical Center  
Fair Lawn, NJ, USA

**OLAV ISTRE, M.D., PH.D.**

Consultant of Gynecology & Obstetrics  
Ullevål University Hospital  
Oslo, Norway

**GRACE JANIK, M.D.**

Reproductive Specialty Center  
Milwaukee, WI, USA

**ROSANNE M. KHO, M.D.**

Senior Associate Consultant of Gynecology  
Mayo Clinic Scottsdale  
Scottsdale, AZ, USA

**MIROSLAV KOPJAR, M.D.**

Department for Gynaecology and Obstetrics  
General Hospital Zabok, Croatia

**DANIEL KRUSCHINSKI, M.D.**

EndoGyn®  
Institute for Endoscopic Gynaecology  
Seligenstadt, Germany

**RONALD L. LEVINE, M.D.**

Professor of Obstetrics,  
Gynecology & Women's Health  
Section of Operative Gynecologic Endoscopy  
University of Louisville School of Medicine  
Louisville, KY, USA

**BARBARA LEVY, M.D., P.S.**

Assistant Clinical Professor  
Yale University School of Medicine  
University of Washington School of Medicine  
Federal Way, WA, USA

**C.Y. LIU, M.D.**

Director of Chattanooga Women's Laser Center  
Chattanooga, TN, USA

**ANTHONY LUCIANO, M.D.**

Professor of Obstetrics and Gynecology  
University of Connecticut School of Medicine  
Director of the Center for  
Fertility & Women's Health  
New Britain General Hospital  
New Britain, CT, USA

**DANIELLE E. LUCIANO, M.D.**

Fellow in Advanced Gynecologic Endoscopy  
Department of Obstetrics and Gynecology  
University of Connecticut School of Medicine  
Center for Fertility & Women's Health  
New Britain General Hospital  
New Britain, CT, USA

**THOMAS L. LYONS, M.D.**

Director of Health South Surgery Center  
Center for Women's Care & Reproductive Surgery  
Atlanta, GA, USA

**JAVIER F. MAGRINA, M.D.**

Professor of Obstetrics and Gynecology  
Barbara Woodward Lips Professor  
Mayo Clinic Scottsdale  
Scottsdale, AZ, USA

**DAN C. MARTIN, M.D.**

Clinical Professor of Obstetrics and Gynecology  
University of Tennessee, Memphis  
University of Tennessee Health Sciences Center  
Memphis, TN, USA

**TIM B. MCKINNEY, M.D.**

Associate Professor of Obstetrics and Gynecology  
 Chief of Urogynecology and Pelvic Reconstruction  
 Surgery at UMDNJ-SOM  
 Director of Fellowship in Urogynecology at Athena  
 Women's Medical Center  
 Medical Director and founder/owner of T-DOC LLC  
 Moorestown, NJ, USA

**ENDA McVEIGH, M.D.**

Senior Fellow in Reproductive  
 Medicine & Medical Director  
 Oxford Fertility Unit  
 Oxford University  
 Headington, Oxford, UK

**JOHN R. MIKLOS, M.D.**

Director of Urogynecology  
 Atlanta Center for Laparoscopic Urogynecology  
 & Reconstructive Vaginal Surgery  
 Clinical Instructor  
 Medical College of Georgia  
 Atlanta, GA, USA

**ROBERT D. MOORE, DO**

Director of Advanced Pelvic Surgery  
 Co-Director Urogynecology  
 Atlanta Urogynecology Associates  
 Atlanta Center for Laparoscopic Urogynecology  
 Alpharetta, GA, USA

**CEANA NEZHAT, M.D.**

Director of Obstetrics & Gynecology  
 Atlanta Center for Special Pelvic Surgery,  
 Atlanta, GA, USA

**FARR NEZHAT, M.D.**

Director of Gynecologic Minimally Invasive Surgery  
 Department of Gynecology Oncology  
 Mount Sinai School of Medicine  
 New York, NY, USA

**DAVID L. OLIVE, M.D.**

Vice Chairman of Obstetrics and Gynecology  
 University of Wisconsin  
 Madison, WI, USA

**RESAD P PASIC, M.D., PH.D.**

Associate Professor of Obstetrics,  
 Gynecology & Women's Health  
 Director, Section of Operative  
 Gynecologic Endoscopy  
 University of Louisville School of Medicine  
 Louisville, KY, USA

**WOJCIECH PAWLINA, M.D.**

Associate Professor and Chair  
 Department of Anatomy  
 Mayo Clinic College of Medicine  
 Rochester, MN, USA

**TANJA PEJOVIC, M.D., PH.D.**

Department of Obstetrics and Gynecology  
 Division of Gynecologic Oncology  
 Oregon Health & Science University  
 Portland, OR, USA

**HARRY REICH, M.D.**

Attending Physician, Wyoming Valley  
 Health Care System  
 Wilkes-Barre, Pennsylvania  
 Community Medical Center, Scranton, Pennsylvania  
 St. Vincent's Hospital and Medical Center  
 of New York  
 Shavertown, PA, USA

**LISA M. ROBERTS, M.D.**

Fellow of Advanced Gynecologic  
 Endoscopic Surgery  
 Shavertown, PA, USA

**ROBERT ROGERS, JR., M.D.**

Clinical Assistant Professor of OB/Gyn  
 University of Pennsylvania  
 Philadelphia, PA  
 Attending Physician  
 The Reading Hospital & Medical Center  
 Reading, PA, USA

**GERARD ROY, M.D.**

Attending Physician  
 Clinical Instructor of Obstetrics and Gynecology  
 Center for Fertility and Women's Health  
 New Britain General Hospital  
 New Britain, CT, USA

**DAVID SHIN, M.D.**

Associate, Urology Specialty Care  
Mount Sinai School of Medicine, New York  
Hackensack University Hospital and St. Joseph's  
Medical Center  
Fair Lawn, NJ, USA

**ASSIA STEPANIAN, M.D.**

Fellow of Advanced Endoscopic Surgery  
Center for Women's Care and Reproductive Surgery  
and Emory University School of Nursing  
Atlanta, GA, USA

**BENJAMIN D. TANNER, M.D.**

Fellow in Minimally Invasive Surgery  
Department of Surgery  
University of Louisville School of Medicine  
Louisville, KY, USA

**CLAIRE TEMPLEMAN, M.D.**

Assistant Professor of Obstetrics,  
Gynecology & Surgery  
Keck School of Medicine  
University of Southern California  
Children's Hospital of Los Angeles  
Division of Pediatric Surgery  
Women and Children's Hospital  
Los Angeles, CA, USA

**MICHAEL P. TRAYNOR, M.D., MPH**

Northwest Kaiser Permanente  
Mt. Talbert Medical Office  
Clackamas, OR, USA

**WENDY WINER, RN, BSN**

Endoscopic Surgery Specialist  
Center for Women's Care and Reproductive Surgery  
and Emory University School of Nursing  
Atlanta, GA, USA

**KATERINA L. YAROTSKAYA, M.D.**

Senior Researcher of Operative Gynecology  
Scientific Center for Obstetrics,  
Gynecology & Perinatology  
of the Russian Academy of Medical Sciences  
Professor of Reproductive Medicine and Surgery  
Moscow State University of Medicine and Dentistry  
Moscow, Russia

---

# CONTENTS

List of Contributors	ix
Foreword	xv
Preface	xvii
Acknowledgements	xix
1 Patient preparation <i>Ronald L. Levine</i>	1
2 Pelvic anatomy seen through the laparoscope <i>Robert M. Rogers Jr</i>	7
3 Instrumentation and equipment <i>Ronald L. Levine</i>	19
4 Anesthesia in laparoscopy <i>Laura Clark</i>	39
5 Creation of pneumoperitoneum and trocar insertion techniques <i>Resad Pasic</i>	57
6 Energy systems in laparoscopy <i>Andrew Brill</i>	75
7 All you need to know about laparoscopic suturing <i>Resad Pasic</i>	97
8 Laparoscopic tubal sterilization <i>Ronald L. Levine</i>	109
9 Endometriosis <i>Dan C. Martin</i>	117

---



10	Laparoscopic surgery for adhesions <i>Harry Reich, Lisa M Roberts, and Enda McVeigh</i>	129
11	Ectopic pregnancy <i>Danielle E Luciano, Gerard Roy, and Anthony Luciano</i>	155
12	Endoscopic surgery for chronic pelvic pain <i>David L Olive</i>	169
13	Laparoscopic management of the adnexal mass <i>C William Helm and Resad Pasic</i>	179
14	Laparoscopic presacral neurectomy <i>Ceana Nezhat and Deidre Fisher</i>	191
15	Laparoscopic hysterectomy <i>Robert S Furr and CY Liu</i>	197
16	Laparoscopic supracervical hysterectomy <i>Thomas L Lyons, Assia Stepanian, and Wendy K Winer</i>	211
17	Laparoscopic myomectomy and laparoscopically assisted myomectomy <i>Ceana Nezhat and Deidre Fisher</i>	223
18	Laparoscopic occlusion of uterine arteries <i>Kirsten Hald and Olav Istre</i>	231
19	Tissue retrieval in endoscopic surgery <i>Eric Heinberg and Resad P Pasic</i>	239
20	Retroperitoneal dissection of the pelvic sidewall for benign disease <i>Grace M Janik</i>	251
21	Lower urinary tract endoscopy <i>Sam H Hessami and David Shin</i>	261
22	Laparoscopic paravaginal repair and burch urethropexy <i>Robert D Moore and John R Miklos</i>	271
23	Tension free vaginal tape and TOT sling for stress urinary incontinence <i>Robert D Moore and John R Mikos</i>	287
24	Pelvic floor surgery <i>Timothy B McKinney</i>	295

25	Laparoscopic sacralcolpopexy and enterocele repair with mesh <i>Robert D Moore and John R Miklos</i>	309
26	Use of mesh in vaginal pelvic reconstructive surgery <i>Sam H Hessami</i>	327
27	Pediatric laparoscopy <i>Claire Templeman and S Paige Hertweck</i>	339
28	Endoscopic diagnosis and correction of malformations of female genitalia <i>Leila V Adamyan and Katerina L Yarotskaya</i>	347
29	Laparoscopic bowel surgery <i>Jeff W Allen and Benjamin D Tanner</i>	365
30	Gasless laparoscopy <i>Daniel Kruschinski, Bernd Bojahr, and Miroslav Kopjar</i>	377
31	Laparoscopic radical hysterectomy: traditional and nerve-sparing technique <i>Javier F Magrina, Rosanne Kho, and Wojciech Pawlina</i>	391
32	Laparoscopic lymphadenectomy in gynecologic oncology <i>Farr Nezhat and Tanja Pejovic</i>	407
33	Robotics: the clinical nuts and bolts to applications in minimally invasive gynecologic surgery <i>Arnold P Advincula</i>	415
34	Complications of laparoscopy <i>Barbara Levy and Michael Traynor</i>	427
	Index	445

# PATIENT PREPARATION



**Ronald L. Levine, M.D.**

**M**inimally invasive, laparoscopic surgery is, and must always be, considered major surgery. Therefore, it is important to carefully prepare the patient for surgery both psychologically as well as physically. The surgeon must also be prepared by adequate training and practice in the techniques that are necessary to complete the procedure in a safe and efficient manner. Patient preparation begins with the initial decision to perform laparoscopic surgery, and although it is tempting to convert most procedures to a minimally invasive route, the surgeon must consider if the particular pathology should be approached in this manner and is in the best interest of the patient. Just as importantly, the surgeon must honestly evaluate his/her own ability and training.

## PATIENT EVALUATION

Initial patient evaluation considers the indications and contraindications of laparoscopic surgery. There are no hard and fast rules and even the term “absolute contraindication” must be considered as a guideline, rather than a final decree.

# PELVIC ANATOMY SEEN THROUGH THE LAPAROSCOPE



*Robert M. Rogers, Jr., M.D.*

**F**or laparoscopists, female pelvic anatomy is that of surfaces and underlying abdominal and retroperitoneal structures. Surface landmarks on the anterior abdominal wall locate safe areas in which to pass laparoscopic trocars to establish ports through which laparoscopic instruments can be passed into the pelvic cavity to perform the planned surgery. Superficial peritoneal landmarks within the pelvis alert the operator to key anatomic structures in the retroperitoneal spaces. A sure knowledge of surgical and laparoscopic anatomy is a requisite for performing laparoscopic procedures that are safe for the patient and achieve the desired goal of the surgery. The three-dimensional field of pelvic anatomy as seen through the two-dimensional plane of the laparoscope is a difficult challenge to master. The diligent laparoscopic gynecologist must always study and then observe carefully in order to gain this sure, working knowledge. Just as technical skills can be consistently improved through frequent and proper practice, so can one's working knowledge of gynecologic surgical pelvic anatomy.

The following will be discussed: the anterior abdominal wall; the presacral space; the area of the pelvic brim; the sidewall of the pelvis; the

# INSTRUMENTATION AND EQUIPMENT



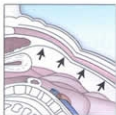
*Ronald L. Levine, M.D.*

**M**any modern operating rooms have been designed to accommodate operative endoscopies; however, there are some variations depending upon the individual requirements of the operating surgeon. Herein, we describe the general requirements of both the setup and the basic equipment that is necessary to perform safe and efficient gynecologic endoscopic surgery. However, there are expanding technologies that are more appropriate for advanced surgery. Some of the most advanced instruments are the robotic surgical equipment and newer forms of energy application. The use of this equipment will also be discussed in other chapters.

## GENERAL ROOM SETUP

The setup should be designed to optimize efficiency using the team concept. The team usually consists of the surgeon, a first assistant, a scrub nurse and a circulating nurse. The most recent addition to the traditional team is the biomedical technician. He/she may not be required for the entire case, but it is helpful if they are in attendance at the start, as well

# ANESTHESIA IN LAPAROSCOPY



*Laura Clark, M.D.*

**M**any surgical procedures dictate the management of anesthesia. The procedure of laparoscopy creates its own subset of factors unique to the procedure itself. The impact of laparoscopy on the human body went relatively unnoticed in its infancy because the majority of cases initially were laparoscopic tubal sterilizations performed in a relatively short time on young, healthy individuals.

Barring complications, these individuals could adjust quite well to the changes that occur during laparoscopy. Only when the technique expanded, both in use and type of operations, was the full impact apparent. Presently, laparoscopic operations are frequently longer and the population may have other disease processes, and may even be elderly. This subset of patients has not been able to compensate as well as young, healthy patients and the true impact of these physiologic changes is being delineated. This expansion has been a useful and productive development but as shown later in this chapter, the choice of laparoscopy versus an open procedure is made by the physiologic impact of the laparoscopy on the individual patient during the operative procedure and not only on the physical factor of surgery without a major incision.

# CREATION OF PNEUMOPERITONEUM AND TROCAR INSERTION TECHNIQUES

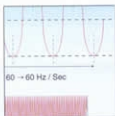


*Resad Pasic M.D., Ph. D.*

**P**roper patient positioning is essential for performing laparoscopic procedures.

The patient is placed in a dorsolithotomy position with the buttocks extended over the end of the table. The thighs should be flexed ( $120^\circ$ ) to allow good instrument manipulation (Figure 1). Attention should be given to proper positioning of the patient's legs to avoid peroneal nerve injury during lengthy procedures. Shoulder braces may be used to make the steep Trendelenburg position possible during surgery. If shoulder braces are used they should be placed over the acromion to avoid possible nerve injury. It is advisable that both arms should be tucked along the patient's body to provide more space for the surgeons and prevent brachial plexus injury. This is essential, especially if the TV monitor is positioned between the patient's legs, as it permits the surgeon more room to move backwards and to keep a comfortable position during surgery. If electrosurgery is to be used during the procedure, a return plate for unipolar instruments must be properly placed over the patient's thigh, and full surface contact of the plate must be assured. Straight bladder catheterization is performed for short laparoscopic procedures or a

# ENERGY SYSTEMS IN LAPAROSCOPY



*Andrew Brill, M.D.*

**E**lectricity is produced when valence electrons are freed from atoms of conductive materials. When these electrons are set in motion in the same direction an electric current (I) is produced that is measured in amperes. Opposite charges on the ends of the conductor cause the electrons to flow in one direction toward the positive terminal. The difference in potential between the positive and negative poles provides the electromotive force (voltage) to drive the current through the conductor (Figure 1).

Current that flows in one direction through a circuit is called direct current (DC). When alternating current (AC) flows through a circuit, the movement of electrons reverses direction at regular intervals, which is expressed as cycles per second (Hertz). Since the effects of current on the load are all that is important, the periodic reversal of current flow does not undo its work.

The amount of current that flows through a circuit is determined by the electromotive force (voltage) across the circuit and the resistance that circuit provides to the current. Resistance (R) is the difficulty that a material presents to the flow of electrons and is measured in Ohms.



# ALL YOU NEED TO KNOW ABOUT LAPAROSCOPIC SUTURING



*Resad Pasic, M.D., Ph.D.*

**W**hy do laparoscopic surgeons avoid suturing?

The perception is that it is cumbersome to learn and perform.

Surgeons are unfamiliar with:

- principles of needle introduction
- principles of needle positioning and suturing
- knot tying techniques

As laparoscopic hysterectomies, myomectomies, bladder suspensions, pelvic wall reconstructions and other advanced endoscopic procedures are becoming the accepted method of treatment, there is an increasing need for laparoscopic suturing techniques. Laparoscopic ligation and suturing is used for approximation of tissue planes and effectively provides hemostasis. Laparoscopic suturing requires significant hand-eye coordination, since laparoscopic procedures are performed while monitoring a bi-dimensional TV screen with up to six times magnification; this eliminates depth perception and the direct tactile feeling of the tissue. Suturing represents the third level of laparoscopic skills.

# LAPAROSCOPIC TUBAL STERILIZATION



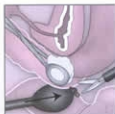
*Ronald L. Levine, M.D.*

Laparoscopic sterilization is the most common type of female sterilization surgery performed in the United States. There are essentially three major methods, however, occasionally a surgeon may still use thermal coagulation.

1. Electrosurgical:
  - a. Monopolar
  - b. Bipolar
2. Clips:
  - a. Hulka
  - b. Filshie
3. Bands (Fallope ring)
4. Thermal coagulation

All of the methods that will be described may be performed through either a single puncture technique using an operating laparoscope (Figure 1), or through a double puncture technique, using a 5 mm second puncture trocar that may be placed in the midline suprapubic area.

# ENDOMETRIOSIS



*Dan C. Martin, M.D.*

## INTRODUCTION

**E**ndometriosis is diagnosed in several clinical situations including surgery for pain, infertility, mass, and sterilization. Some presentations, locations, and sizes are readily treated at laparoscopy while others may be better approached at laparotomy. The purpose of this chapter is to describe the recognition and treatment of those lesions which generally are found and treated at laparoscopy.

Controversial concepts will also be addressed. These include biopsy for confirmation, coagulation vs. excision and treatment of asymptomatic endometriosis seen at laparoscopy for sterilization.

## GOALS OF SURGERY

The surgery plans depend on the goals of treatment. Limited surgery may be best for fertility surgery as it may cause fewer adhesions than extensive dissection. Deep dissection and complete removal of endometriosis appears to be a better approach for deep infiltration and

# LAPAROSCOPIC SURGERY FOR ADHESIONS



*Harry Reich, M.D.*  
*Lisa M. Roberts, M.D.*  
*Enda McVeigh, M.D.*

## INTRODUCTION

**A**dhesions may be defined as abnormal attachments between tissues and organs. They can be either congenital or acquired. Acquired adhesions develop in response to trauma to the peritoneum either as a result of surgery or inflammation. Postoperative adhesions may occur after almost every abdominal surgery and are the leading cause of intestinal obstruction. Adhesions are almost an inevitable consequence of peritoneal surgery. In one study, 93% of patients who had undergone at least one previous open abdominal operation had post surgical adhesions. This is not surprising, given the extreme delicacy of the peritoneum and the fact that apposition of two injured surfaces nearly always results in adhesion formation.

Adhesiolysis should be undertaken to relieve the symptoms of adhesions only in selected cases. For example, good results can be achieved with ovarian adhesiolysis in improving fertility in women. Division of the adhesions around the ovary has been shown to increase pregnancy rates by over 50%. The effectiveness of adhesiolysis in treating chronic pain is

# ECTOPIC PREGNANCY



*Danielle E. Luciano, M.D.*  
*Gerard Roy, M.D.*  
*Anthony Luciano, M.D.*

## INTRODUCTION

**P**regnancy outside the confines of the uterine cavity has been described for hundreds of years. In the 1800s, the mortality associated with ectopic pregnancy was >60%. Today it accounts for 9% of pregnancy related mortality and less than 1% of overall mortality in women. Figure 1 depicts this data from 1970-2000. During this period, we see a greater than 90% reduction in mortality despite more than a 5-fold increase in the overall incidence.

Although ectopic pregnancy has been recognized for over 400 years, it continues to be an ever-increasing affliction affecting greater than 2% of all pregnancies. The rising incidence of ectopic pregnancies in the past 25 years has been attributed to a number of different risk factors listed in Table 1. Theoretically, anything that impedes migration of the conceptus to the uterine cavity may predispose a woman to develop an ectopic gestation. These may be intrinsic anatomic defects in the tubal epithelium, hormonal factors that interfere with normal transport of the conceptus, or pathologic conditions that affect normal tubal functioning.

## ENDOSCOPIC SURGERY FOR CHRONIC PELVIC PAIN



*David L. Olive, M.D.*

**C**hronic pelvic pain should not be considered a primary surgical disease, but in some cases laparoscopic intervention may prove to be of value. Three procedures detailed here have some application to this problem; each can be helpful in specific instances where patients have been thoroughly evaluated and a number of diagnoses excluded. Thus, it is imprudent to think of these procedures as generalized approaches to the problem of chronic pelvic pain. Rather, these surgeries represent highly specialized techniques to combat specific pathologies.

A second aspect these three procedures share is a lack of proven efficacy. While all seem theoretically sound, only the laparoscopic uterosacral nerve ablation has undergone testing via randomized clinical trial, and even here the numbers are small and follow-up is brief. Before these procedures are adopted as routine, more rigorous testing and evaluation are clearly needed.

Chronic pelvic pain (CPP) is the bane of existence for many gynecologists: it is difficult to diagnose, and treatments are often of questionable efficacy. Medical therapy is generally the initial therapy; only when this has failed do gynecologists resort to surgical intervention. Even in this

# LAPAROSCOPIC MANAGEMENT OF THE ADNEXAL MASS



*C. William Helm, M.D., MB, BChir*  
*Resad Pasic, M.D., Ph.D.*

**T**he management of an adnexal mass remains one of the most interesting and rewarding areas for the gynecologist and combines the need for appropriate work-up and sound judgment to ensure the optimum outcome for the patient.

The laparoscope is a tool in the surgical armamentarium that should be utilized in the appropriate fashion and not every patient with an adnexal mass can be managed laparoscopically.

## WHAT CONSTITUTES AN ADNEXAL MASS?

Although the adnexa strictly includes only the ovary, fallopian tube, and broad ligament, blood vessels and fascia contained in it, there are many causes of a mass laterally placed in the pelvis which need to be included in the differential diagnosis.

For the purposes of this chapter only gynecologic conditions will be considered.

The questions in relation to an adnexal mass which need addressing are: what is the cause of the mass? Does it need surgical treatment and if so, what kind of surgery?

# LAPAROSCOPIC PRESACRAL NEURECTOMY



*Ceana Nezhat, M.D.*  
*Deidre Fisher, M.D.*

## INTRODUCTION

In 1899, Jaboulay first described presacral neurectomy as the severance of sacral sympathetic afferent fibers using a posterior extraperitoneal approach. In the same year, Ruggi described resections of the utero-ovarian plexus. Leriche advocated periaxillary sympathectomy of the internal iliac arteries. Perhaps the most fervent advocate of presacral neurectomy was Cotte, who in 1937 reported excellent results (98% success rate) after transection of the superior hypogastric plexus in 1500 patients. He emphasized that the only nerve tissue that should be resected is that within the interiliac triangle, and that resection of all nerve elements in the triangle is essential. Recent advances in endoscopic surgery have allowed surgeons to perform the technique via laparoscopy.

Twenty to twenty-five per cent of patients with central dysmenorrhea fail to respond to medical management and presacral neurectomy continues to be a useful alternative for these women. Presacral neurectomy is indicated in women who have disabling midline dysmenorrhea and pelvic pain who have not responded to medication. It has been proven



# LAPAROSCOPIC HYSTERECTOMY



*Robert S. Furr, M.D.*  
*C. Y. Liu, M.D.*

## INTRODUCTION

The advent of advanced laparoscopy has facilitated its use for removal of the uterus. The extent to which laparoscopy is used varies depending on the underlying pathology, uterine mobility, vaginal accessibility and the laparoscopic skills of the gynecologic surgeon. When a hysterectomy is indicated, the transvaginal approach should first be considered. If a vaginal hysterectomy is not feasible, a laparoscopic evaluation of the pelvis may be considered before a large abdominal incision is made. In the majority of cases, a laparoscopically assisted vaginal, laparoscopic supracervical, or total laparoscopic hysterectomy can be performed. The advantages of these minimally invasive techniques over the abdominal approach are now well documented in the literature.

Traditionally, the laparoscopic approach has been more commonly reserved to facilitate a vaginal hysterectomy. However, for the advanced laparoscopic surgeon, the uterus can be completely detached from its surrounding structures laparoscopically. In this chapter we will illustrate the various steps of

# LAPAROSCOPIC SUPRACERVICAL HYSTERECTOMY



*Thomas L. Lyons, M.D.*  
*Assia Stepanian, M.D.*  
*Wendy K. Winer, R.N.*

**A**s stated by Finley in 1943, hysterectomy in general must be used to: 1. save life, 2. correct deformity, or 3. eliminate suffering. Historically, most hysterectomies were performed in a subtotal or supracervical manner and morbidity and mortality (M&M) were significant. The reasons for this high rate of M&M were poor anesthesia techniques, absence of antibiotic therapy, and lack of modern blood banking procedures. During the first half of the 20<sup>th</sup> century gradual progress was made in the technical aspects of the procedure. By the mid 1940's, when anesthesia was improving and antibiotics became available, mortality rates decreased rapidly.

In addition, another influence was present at that time. The existing mortality rate from cervical carcinoma was high, making this disease the third most common killer of women in the US. Between 1940 and 1955 the rate of total versus subtotal hysterectomy was reversed. Whereas the subtotal rate was 85%-95% in the early 1940's, by 1955 the subtotal rate was less than 5%. The stated reason for this shift was to lower the death rate from cervical cancer. This stated goal was not accomplished until PAP smears became routine in the US in 1958. However, the wholesale

# LAPAROSCOPIC MYOMECTOMY AND LAPAROSCOPICALLY ASSISTED MYOMECTOMY



*Ceana Nezhat, M.D.*  
*Deidre Fisher, M.D.*

**M**yomas are the most common uterine neoplasm, affecting 20-25% of women of reproductive age. Myomas develop from the benign transformation and proliferation of smooth muscle cells, and can occur in any area with smooth muscle cells of Müllerian origin. Uterine myomas can cause abnormal uterine bleeding, abdominal pressure, urinary frequency, and constipation. The severity of these symptoms is dependent on the number of tumors, their size, and location (Figure 1). Although not primarily the cause of infertility, myomas have been linked to fetal wastage and premature delivery. Indications for treatment are listed below. The number, size, and location of the tumors influence the technique used.

Preoperative evaluation should include assessment of anemia. The use of gonadotropin-releasing hormone (GnRH) is indicated for anemic patients as it may restore a normal hematocrit, decrease the size of the myoma, and reduce the need for transfusion. An intravenous pyelogram may be indicated to check for ureteral obstruction when there is a large broad ligament myoma. Pelvic ultrasound is another preoperative tool to monitor the growth rate of asymptomatic myomas and to check for submucous tumors.

# LAPAROSCOPIC OCCLUSION OF UTERINE ARTERIES



*Kirsten Hald, M.D.*

*Olav Istre, M.D., Ph.D.*

## INTRODUCTION

Since Ravina published the first report of arterial embolization (UFE) for treatment of uterine fibroids in 1995, several observational studies have subsequently reported effective relief in symptoms of excessive menstrual bleeding or pressure in about 84%-90% of the patients. This treatment has gained increasing popularity among women with such complaints who wish to retain their uteri. Bilateral laparoscopic occlusion of uterine arteries represents another modality of avoiding hysterectomy in these women. In 2000, Liu first published the description of this technique by the use of bipolar coagulation of uterine arteries and anastomotic sites of ovarian arteries. Treatment of women with fibroids and menorrhagia symptoms using bilateral ligation of the uterine artery is not new. In 1890 Rydygier published the first paper presenting the effect of this technique. In 1964, an article by Bateman in the *American Journal of Obstetrics and Gynecology* also reported successful treatment of fibroids and menorrhagia by bilateral ligation. Recently, several authors have reported effective treatment of laparoscopic bilateral occlu-

# TISSUE RETRIEVAL IN ENDOSCOPIC SURGERY



*Eric Heinberg, M.D.*  
*Resad Pasic, M.D.*

**G**aining access to the body's deep structures while avoiding large skin incisions is the essence of advanced laparo-endoscopic surgery. Minimally invasive techniques have expanded to encompass all areas of surgery and their advancement has reached levels unimaginable even a decade ago. Yet, the advantage of a skillfully performed laparoscopic procedure is greatly diminished if the procedure culminates in a large incision created for the removal of an extirpated organ or tissue. This challenge has led one prominent pioneer of laparoscopy to refer to the creation of effective, minimally invasive techniques for laparoscopic tissue retrieval as the "Holy Grail" of the discipline. Such techniques must be safe for the patient and both time and cost efficient if they are to enhance the inherent benefits of advanced laparoscopic surgery.

## CLASSICAL TECHNIQUES

Prior to the advent of specialized instrumentation, laparoscopic tissue retrieval was accomplished using simple techniques derived from open surgery. Benign specimens up to 8 mm in diameter, such as oviducts,

# RETROPERITONEAL DISSECTION OF THE PELVIC SIDEWALL FOR BENIGN DISEASE



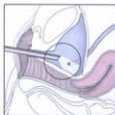
*Grace M. Janik, M.D.*

**M**any gynecologists use a procedure-based approach to benign gynecologic surgery with limited use of pelvic anatomy. While many operations can be performed safely by this method, surgical skills often plateau before the surgeon has the ability to confidently manage complex pathology with minimal complications. An anatomic surgical approach puts emphasis on using fixed anatomic landmarks in the pelvis to safely dissect and identify vital structures from areolar connective tissue and pathology. The vital structures of the pelvis are primarily located in the retroperitoneal space of the pelvic sidewall. Once they are located, the remainder of the operation becomes relatively straight forward and safe, enabling successful completion of complex surgical procedures such as peritoneal resection of cul de sac endometriosis, adhesiolysis of severe adnexal adhesions or remnant ovary, sacrocolpopexy, and laparoscopic hysterectomy of large uterus.

## LAPAROSCOPIC SURGICAL ANATOMY

*Anatomy is a constant, but its appearance varies based on how it is visualized and approached. Laparoscopy offers some distinct advantages*

# LOWER URINARY TRACT ENDOSCOPY



*Sam H. Hessami, M.D.*  
*David Shin, M.D.*

## INTRODUCTION

**G**ynecologists have not been traditionally trained in performing endoscopy of the lower urinary tract. Cystourethroscopy, when compared to hysteroscopy and laparoscopy, is one of the simpler procedures to teach and to learn. Medically speaking, given the close proximity of the genital organs to the urinary tracts, it is necessary for gynecologists to ensure the intactness of the urinary system after complicated pelvic procedures. Although the benefits of the routine use of cystoscopy after certain gynecologic procedures such as vaginal hysterectomy has been debated, there is no question that with advances in pelvic reconstructive surgery and the use of synthetic and non-synthetic grafts, it is incumbent on every surgeon to ensure intactness of the urinary tract. Failure to identify iatrogenic injuries intraoperatively will have life changing and catastrophic sequelae for the patient. More complex vaginal procedures, such as those for advanced pelvic organ prolapse, where the ureters are at greatest risk for injury, also dictate routine cytosopic evaluation at the end of the procedure.

# LAPAROSCOPIC PARAVAGINAL REPAIR AND BURCH URETHROPEXY



*Robert D. Moore, D.O.*

*John R. Miklos, M.D.*

Since the introduction of the retropubic urethral suspension in 1910, over 100 different surgical techniques for the treatment of genuine stress urinary incontinence (GSUI) have been described. Many have been modifications of original procedures in an attempt to improve clinical outcome, shorten operative time, and reduce surgical morbidity. Despite the number of surgical procedures developed each year, the Burch colposuspension and pubovaginal sling operations have remained the mainstay of surgical correction for GSUI because of their high long-term cure rates. However, these procedures do not address the concurrent anterior vaginal wall prolapse often associated with GSUI secondary to urethral hypermobility. We present a laparoscopic approach to anterior vaginal wall reconstruction using the paravaginal repair and Burch colposuspension for treatment of cystocele and stress urinary incontinence, respectively, resulting from lateral vaginal wall support defects.

Emphasizing the principles of minimally invasive surgery, the laparoscopic approach has been successfully adopted for many procedures that previously relied on an abdominal or transvaginal route. First described in 1991, the laparoscopic retropubic colposuspension has rap-



# TENSION FREE VAGINAL TAPE AND TOT SLING FOR STRESS URINARY INCONTINENCE



*Robert D. Moore, D.O.*

*John R. Miklos, M.D.*

**P**ubovaginal sling procedures have long been utilized for effective treatment of stress urinary incontinence. Traditional sling procedures require relatively large vaginal and suprapubic incision(s) or bone fixation devices and have been reported to have high incidence of postoperative voiding dysfunction. The traditional sling procedures also have never been standardized. Recently, minimally invasive mid-urethral mesh slings have been introduced in Australia, Europe and the United States. The Tension-Free Vaginal Tape sling was the first sub-urethral sling in this new category of minimally invasive mid-urethral slings to be introduced for the surgical correction of female genuine stress urinary incontinence (GSUI). First described by Ulmsten and Petros in 1995, the TVT procedure (Tension-Free Vaginal Tape, Gynecare, Somerville, NJ) has been used extensively in Europe and in the United States since clinical trials established its safety and effectiveness as an ambulatory surgical procedure for treatment of GSUI in women (Figure 1). TVT is provided in a kit that contains a 1.1 cm x 40 cm polypropylene mesh (Prolene, Ethicon, Inc., Somerville, NJ) covered by a plastic sheath and connected to two 5 mm stainless steel needles (Figure 2). The plastic sheath allows easy passage/placement of the tape, and is thought to reduce risk of

# PELVIC FLOOR SURGERY



*Timothy B. McKinney, M.D.*

**T**hroughout hundreds of years of the earliest writings on operative gynecology, the problems of pelvic support have always been referred to as pelvic relaxation. Over the past 25 years, we have witnessed a major shift in our understanding of the concepts of pelvic floor support. Defects in these supports leads to a relationship which, if re-established, will generate the normal anatomical support of the internal pelvic viscera. Terms such as generalized stretching and attenuation have been employed commonly in almost all descriptions. The consensus has been that to repair all support tissue, it was necessary to correct the generalized stretching by way of plicating, resecting or shortening these attenuated tissues. The true causes of genital urinary prolapse are failures of the fibromuscular support system to confine the visceral organs within the pelvic cavity. When this fibromuscular support system of endopelvic fascia is damaged, visceral organ prolapse/herniation results. The anatomical proximity of all female genital organs to the lower urinary tract and alimentary tract predispose pelvic organ prolapse and can easily affect bladder, urethra and rectal function. This prolapse leads to voiding and defecating difficulties as well as sexual dysfunction in females (Figures 1 and 2).

# LAPAROSCOPIC SACRALCOLPOPEXY AND ENTEROCELE REPAIR WITH MESH



*Robert D. Moore, D.D.*

*John R. Miklos, M.D.*

## INTRODUCTION

The anatomy, pathophysiology, and treatment of pelvic organ prolapse has significantly evolved over the last decade with increasing understanding of anatomy and development of minimally invasive surgical procedures. Although support for the pelvic viscera, the vagina, and neighboring structures involves a complex interplay between muscles, fascia, nerve supply, and appropriate anatomic orientation, the endopelvic fascia and pelvic floor muscles provide most of the support function in the female pelvis. Laparoscopic reconstructive pelvic surgery requires a thorough knowledge of pelvic floor anatomy and its supportive components before repair of defective anatomy is attempted. This chapter reviews the anatomy and laparoscopic repair of vaginal vault prolapse and enterocele with Y-mesh sacralcolpopexy.

# USE OF MESH IN VAGINAL PELVIC RECONSTRUCTIVE SURGERY



*Sam H. Hessami, M.D.*

## INTRODUCTION

**W**omen have an 11% lifetime risk of undergoing surgery for pelvic organ prolapse. Of concern is the high rate of recurrence involving the same site after reconstructive surgery. The highest recurrence rate is associated with anterior compartment repairs, estimated at 30%, followed by apical repairs estimated at 18% (sacrospinous ligament fixation). Posterior defect repairs are less likely to reoccur. This probably has to do with the mechanics involved and the way rises in intra-abdominal pressure are transmitted to the posterior compartment as opposed to anterior or apical compartments. It is now widely accepted that prolapse occurs as a result of tears in the support structure of pelvic organs. Distal tears in the uterosacral ligaments result in uterine prolapse, while tears in the pubocervical fascia and rectovaginal fascia result in cystoceles and rectoceles, respectively. In case of apical prolapse, vaginal repair techniques include high uterosacral suspension, sacrospinous ligament fixation and iliococcygeus hitch (Inmon's procedure). Anterior compartment defects are believed to be mostly caused by either unilateral or bilateral

# PEDIATRIC LAPAROSCOPY



*Claire Templeman, M.D.*

*S. Paige Hertweck, M.D.*

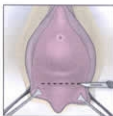
## INTRODUCTION

In adults, laparoscopy is an established alternative to open surgery. However, until recently concerns regarding proven benefit and adequate equipment have limited its use in pediatric patients. The advent of microendoscopic equipment has made pediatric endoscopy more practical but there are some important technical differences between it and adult laparoscopy and they will be the focus of this chapter.

## INDICATIONS

There is now considerable experience with laparoscopy for appendectomy, cholecystectomy, splenectomy exploration of non palpable testis, hernia repair, and trauma in children. Some relevant indications for gynecologists who treat young children and adolescents are listed in Table 1. Specific techniques for the management of ovarian masses and uterovaginal anomalies are detailed in chapters 13 and 28.

# ENDOSCOPIC DIAGNOSIS AND CORRECTION OF MALFORMATIONS OF FEMALE GENITALIA



*Leila V. Adamyan, M.D.*

*Katerine L. Yarotskaya, M.D.*

**C**ongenital malformations of female genitalia comprise about 4% of all congenital anomalies. These malformations are associated with extragenital anomalies in about 74% of cases manifesting as skin marks and skeletal defects, as well as breast, heart, renal and digestive system anomalies. Diagnosis of malformations of the uterus, and/or vagina present significant difficulties that may confuse the character of the disease and cause incorrect, and sometimes, unwarranted or aggressive radical surgery in 24-34% of patients. The high rate of diagnostic mistakes may be due to absence of a universal classification of genital malformations. Suggested classifications do not reflect all clinical-anatomic features of malformations, which are essential for an optimal treatment strategy that will be beneficial for the patient's health, reproductive and sexual function, and general quality of life.

Presently, invasive diagnostic tools (ultrasonography, hysterosalpingography, magnetic resonance imaging and spiral computer tomography) together with endoscopic techniques may permit the determination of the real character of a malformation of the uterus and/or vagina, and reveal concomitant extragenital anomalies of the urinary and digestive

# LAPAROSCOPIC BOWEL SURGERY



*Jeff W. Allen, M.D.*  
*Benjamin D. Tanner, M.D.*

**A**fter mastering basic laparoscopic techniques such as tissue handling, intracorporeal suturing, and optical facility with 0° and 30° telescopes, operations that are more difficult can be performed using a minimal access approach. This includes many operations on the small and large bowel. This chapter will review some advanced laparoscopic procedures such as colon resection and also some of the problems encountered during operations such as closure of iatrogenic enterotomy.

## COLON RESECTION

The laparoscopic approach to colon resection for benign disease is now preferred over the open operation in many circumstances. With malignant disease, concerns over issues of port site recurrences, inadequate oncologic resections, and intraperitoneal tumor spread with pneumoperitoneum have made laparoscopic colectomy controversial. A 2004 prospective, randomized study by Nelson, et al. showed no differences in the overall or surgical wound rates of recurrence between laparoscopic and open colectomy for malignancy. The caveat in this study was

# GASLESS LAPAROSCOPY



*Daniel Kruschinski, M.D.*  
*Bernd Bojahr, M.D.*  
*Miroslav Kopjar, M.D.*

## INTRODUCTION

**G**asless laparoscopy is a system that does not require a pneumoperitoneum. Instead, it uses an abdominal wall lifting system. One such system is the AbdoLift® (Karl Storz Endoscopy, Tuttlingen, Germany). With a special design of the retractors, the AbdoLift® mechanical elevation of the abdominal wall provides the surgeon with the necessary space comparable with that of pneumoperitoneum laparoscopy. As no gas is needed, flexible and valveless trocars can be used. This technique avoids several typical intraoperative problems of pneumoperitoneum laparoscopy such as gas leakage, rinsing and suction as well as removal of tumors and organs out of the abdominal cavity.

By utilizing conventional instruments and standard surgical techniques and avoiding disposables, gasless laparoscopy is a cost-effective procedure with benefits for the patients, surgeons, hospitals, and the health system. Gasless laparoscopy is a simple, effective, and economical introduction to operative laparoscopy and extends the indications of minimally invasive surgery. It combines minimally invasive surgery and



# LAPAROSCOPIC RADICAL HYSTERECTOMY: TRADITIONAL AND NERVE-SPARING TECHNIQUE



*Javier F Magrina, M.D.*  
*Rosanne Kho, M.D.*  
*Wojciech Pawlina, M.D.*

The magnified view provided by the laparoscope to the deep pelvic structures, and direct access with the tip of the laparoscope and the laparoscopic instruments to the deep pelvic structures provide an excellent opportunity for the performance of radical hysterectomy, particularly when performing the nerve-sparing technique. The seven degrees of articulation of robotic instruments, available with the daVinci® robotic interface system (Intuitive Inc, Sunnyvale, CA), offers accurate and minimally traumatic tissue dissection, unsurpassed by the human hand or conventional rigid laparoscopic instrumentation. The surgical technique described below is alike whether the operative approach is robotic or conventional laparoscopy, however, the instrumentation and trocar site placement are different in robotics. All steps of the operation are performed laparoscopically.

## INDICATIONS

Laparoscopic radical hysterectomy is primarily used for patients with cervical cancer Stage IB1 lesions > 2 cm and endometrial cancer Stage IIB. In patients with cervical cancer lesions < 2 cm, the modified radical

# LAPAROSCOPIC LYMPHADENECTOMY IN GYNECOLOGIC ONCOLOGY



*Farr Nezhat, M.D.*

*Tanja Pejovic, M.D.*

In patients with gynecologic cancer, prognosis correlates with the extent of the disease according to the established FIGO classification systems. Surgical staging is superior because it provides histologic verification of tumor extent. Lymph node status is the most important prognostic factor in gynecologic cancer and surgical removal of pelvic and/or para-aortic lymph nodes for histologic assessment is a part of staging of gynecologic malignancies. Additionally, removal of bulky lymph nodes may have therapeutic benefit.

Lymphadenectomy has generally been performed via laparotomy, leading to large incisions and significant intra- and perioperative morbidity. Dargent and Salvat were the first to describe laparoscopic lymphadenectomy for the management of gynecologic malignancies in 1989. In 1991, Querleu et al. reported transperitoneal pelvic lymphadenectomy in 39 patients with cervical cancer. First laparoscopic para-aortic lymphadenectomy was reported by Nezhat et al. in 1991-1993 in a series of patients with cervical cancer undergoing laparoscopic radical hysterectomy and pelvic and para-aortic lymphadenectomy. Since that time a number of other reports have described the safety and accuracy of

# ROBOTICS: THE CLINICAL NUTS AND BOLTS TO APPLICATIONS IN MINIMALLY INVASIVE GYNECOLOGIC SURGERY

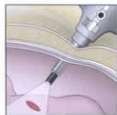


*Arnold P. Advincula, M.D.*

## INTRODUCTION

**T**he role of robotics in minimally invasive gynecologic surgery can best be summed up with one word - evolution. The application of endoscopic techniques to the practice of gynecologic surgery has come a long way from Boesch's early descriptions of the first gynecologic use of laparoscopy for tubal sterilization in the 1930's. Improvements in endoscopic instrumentation have provided modern day gynecologists with high intensity xenon and halogen light sources, multi-chip cameras, and advanced electrosurgical technology. On the other hand, there remain many limitations. Current conventional laparoscopic instrumentation still has a limited degree of motion within the body that must be balanced by overcoming the inherent fulcrum effect that results in counter-intuitive hand movements. Additionally, the view of the operative field is two-dimensional. Altogether, these limitations continue to result in significant learning curves for advanced endoscopic cases. In an attempt to overcome these obstacles, robotics may represent the next frontier in the evolution of gynecologic endoscopy.

# COMPLICATIONS OF LAPAROSCOPY



*Barbara Levy, M.D.*  
*Michael Traynor, M.D.*

**C**omplications are inherent with any surgical endeavor, whether the procedure is performed by laparotomy or laparoscopy. Often patients pursue laparoscopic surgery in the misguided view that it is not really surgery and that it carries a lower risk of adverse events than 'open' surgery. It should be emphasized that minimally invasive surgery does not mean minimal risk.

Complications of laparoscopic surgery are inevitable. The literature addressing laparoscopic complications is extensive but can be highly variable, depending upon (amongst other things) the complication(s) being addressed, the surgical specialty involved, the type of study examining the issue, and the specific procedure(s) under review.

Keeping with the theme of this book, the purpose of this chapter is not to dwell on any particular type of complication or specific issue. Instead, the following pages will attempt to give a brief overview of laparoscopic complications and "how to" prevent them.

In addition, we will offer some insight into those circumstances in which complications are more likely to occur and how to recognize as well as manage them should they occur.

A PRACTICAL MANUAL OF  
**LAPAROSCOPY**  
AND MINIMALLY INVASIVE  
GYNECOLOGY

**Resad P. Pasic**  
**Ronald L. Levine**

**Second Edition**



**Resad P Pasic, M.D., Ph.D.**

Dr. Pasic is an Associate Professor in the Department of Obstetrics, Gynecology and Women's Health at the University of Louisville School of Medicine, where he serves as the Director of the Section of Operative Gynecologic Endoscopy and Co-Director of the Advanced Gynecologic Endoscopy Fellowship. He completed his medical school education and residency training at Sarajevo University School of Medicine in Bosnia & Herzegovina and earned his Ph.D from the University of Sarajevo and the University of Louisville.

Dr. Pasic is certified in advanced laparoscopy and hysteroscopy and has become an international educator of gynecologic endoscopy. He has published many scientific papers on his research in minimally invasive surgery, serves on the OBGYN.net editorial board, and is an ad hoc reviewer for several scientific journals. Dr. Pasic has lectured for many courses internationally.

Dr. Pasic has served as a member of the Board of Trustees of the AAGL (Advancing Minimally Invasive Gynecology Worldwide) from 2003 – 2005 and currently serves as Secretary/Treasurer. He has served as faculty for a number of AAGL postgraduate courses and is the Course Director of "Advanced Workshops on Gynecologic Laparoscopic Anatomy and Surgery on Unembalmed Female Cadavers" in Louisville, KY. His website is: [www.gynlaparoscopy.com](http://www.gynlaparoscopy.com).



**Ronald L. Levine, M.D.**

Dr. Levine is a Professor in the Department of Obstetrics, Gynecology and Women's Health at the University of Louisville School of Medicine. He has been active in pioneering and teaching laparoscopy since 1970 and has led multiple courses in advanced laparoscopic surgery.

Dr. Levine served several terms as a trustee on the Board of the American Association of Gynecologic Laparoscopists and was President in 1998. He has also served on the Board of the Accreditation Council of Gynecologic Endoscopy from 1994 to the present.

He has co-authored three text books on gynecologic endoscopy, has written many book chapters and has published more than 25 articles in various peer reviewed journals and has had multiple lectureships both nationally and internationally. He has performed laparoscopic surgery on three continents including the first LAVH in Zimbabwe, Africa.

**informa**  
healthcare

[www.informahc.com](http://www.informahc.com)

ISBN 1-84214-330-1



9 781842 143308