

Contents



SECTION 1: ESSENTIALS OF LAPAROSCOPY

1. Chronological Advances in Minimal Access Surgery	3
2. Laparoscopic Imaging Systems	9
• <i>Laparoscopic Trolley</i> 9	
• <i>Imaging Systems</i> 9	
• <i>Light Source</i> 10	
• <i>Light Cable</i> 14	
• <i>Telescope</i> 18	
• <i>Laparoscopic Camera</i> 20	
• <i>Laparoscopic Video Monitor</i> 22	
• <i>Television Systems</i> 23	
• <i>Three-dimensional Vision</i> 27	
• <i>Invention of Ideal Shadow in Laparoscopic Surgery</i> 29	
• <i>Three-dimensional Video Systems</i> 29	
3. Laparoscopic Equipment and Instrument	32
• <i>Insufflation System</i> 32	
• <i>Suction/irrigation System</i> 32	
• <i>Energy Source System</i> 33	
• <i>Laparoscopic Working Instrument</i> 34	
• <i>Port Access Instrument</i> 35	
• <i>Laparoscopic Hand Instruments</i> 36	
• <i>Outer Sheath of Hand Instrument</i> 38	
• <i>Instruments for Sharp Dissection</i> 39	
• <i>Types of Laparoscopic Scissors</i> 40	
• <i>Endoknife (Scalpel)</i> 42	
• <i>Coagulating and Dissecting Electrodes</i> 42	
• <i>Needle Holders</i> 43	
• <i>Knot Pusher</i> 44	
• <i>Laparoscopic Clip Applicator</i> 44	
4. Sterilization of Laparoscopic Instruments	51
• <i>History of Sterilization</i> 51	
• <i>Legislation in Sterilization</i> 51	
• <i>Ultrasonic Technology for Cleaning</i> 52	
5. Anesthesia in Laparoscopic Surgery	57
• <i>Evaluation and Preparation of Patient for Laparoscopic Surgery</i> 57	
• <i>Physiological Changes During Laparoscopy</i> 58	
• <i>Regional Anesthesia</i> 59	
• <i>General Anesthesia</i> 59	
• <i>Local Anesthesia</i> 60	
• <i>Intraoperative Complications</i> 60	

6. Abdominal Access Techniques	67
• <i>Closed Access</i>	67
• <i>Open Access</i>	67
• <i>Closed Access Technique</i>	68
• <i>Introduction of Veress Needle</i>	73
• <i>Primary Trocar Insertion</i>	77
• <i>Pneumoperitoneum in Special Conditions</i>	84
• <i>Entry in Cases of Morbid Obesity</i>	85
• <i>Port Closure Techniques</i>	88
7. Principle of Laparoscopic Port Position	95
• <i>Primary Port Position</i>	95
• <i>Secondary Port Position</i>	95
• <i>First Decide the Target</i>	95
• <i>Port Position in Various Surgeries</i>	97
• <i>Drawbacks of Incorrect Port Position</i>	97
8. Laparoscopic Dissection Techniques	103
• <i>Types of Laparoscopic Dissection</i>	103
• <i>Blunt Dissection</i>	103
• <i>Sharp Dissection</i>	104
• <i>Scissors Dissection</i>	105
• <i>High Frequency Electrosurgical Dissection</i>	105
• <i>Use of the Diathermy Hook</i>	108
• <i>Ultrasonic Dissection</i>	115
• <i>High Velocity Water Jet Dissection</i>	116
• <i>Laser Dissection</i>	116
• <i>Cryotherapy and Radiofrequency Ablation</i>	117
9. Laparoscopic Tissue Approximation Techniques.....	120
• <i>Laparoscopic Suturing and Knotting</i>	120
• <i>Laparoscopic Needle</i>	121
• <i>Roeder's Knot</i>	122
• <i>The Meltzer Slip Knot</i>	126
• <i>The Tayside Knot</i>	126
• <i>Using a Pretied Loop</i>	129
• <i>Extracorporeal Knot for Continuous Structure</i>	130
• <i>Cat Eye Stone</i>	131
• <i>Laparoscopic Internal Suturing</i>	131
• <i>Instrumentation</i>	131
• <i>Continuous Suturing</i>	133
• <i>Applications</i>	133
• <i>Interrupted Sutures</i>	136
• <i>Techniques to Assist in Control of Bleeding</i>	137
10. Hand-assisted Laparoscopic Surgery	140
• <i>Hand Port Devices</i>	142
• <i>Omni Port</i>	143
• <i>Indication of HALS</i>	143
• <i>Advantage of HALS</i>	143
• <i>Limitations of HALS</i>	143
• <i>Lapdisc Hand Access Device</i>	144
• <i>Warnings and Precautions</i>	144
• <i>Future Prospect of HALS</i>	144

11. Tissue Retrieval Technique	149
• <i>Endobags</i> 149	
• <i>Colpotomy</i> 151	
• <i>Hand-assisted Laparoscopic Surgery</i> 153	
• <i>Morcellator</i> 154	
12. Laparoscopic Port Closure Technique	158
• <i>Withdrawal of Instrument and Ports</i> 159	



SECTION 2: LAPAROSCOPIC GENERAL SURGICAL PROCEDURES

13. Laparoscopic Cholecystectomy	165
• <i>Advantage of Laparoscopic Approach</i> 166	
• <i>Exposure of Gallbladder and Cystic Pedicle</i> 166	
• <i>Adhesiolysis</i> 168	
• <i>Dissection of Cystic Pedicle</i> 168	
• <i>Intraoperative Ultrasonography</i> 171	
• <i>Complications of Laparoscopic Cholecystectomy</i> 177	
• <i>Lap Chole and CBD Injury</i> 178	
• <i>Type of CBD Injury</i> 180	
• <i>How to Avoid Injury</i> 181	
14. Laparoscopic CBD Exploration	184
• <i>Intraoperative Cholangiography (IOC)</i> 184	
• <i>Laparoscopic Ultrasonography (LUS)</i> 184	
• <i>Laparoscopic Extraction of Common Bile Duct Stones</i> 185	
• <i>Procedure</i> 186	
15. Laparoscopic Appendectomy	195
• <i>Laparoscopic Anatomy</i> 195	
• <i>Advantage of Laparoscopic Appendectomy</i> 195	
• <i>Alternative Port and Theater Set-up</i> 196	
• <i>Risk Factors in Laparoscopic Appendectomy</i> 199	
16. Laparoscopic Repair of Inguinal Hernia	205
• <i>Laparoscopic Anatomy</i> 205	
• <i>Indications of Laparoscopic Repair of Hernia</i> 207	
• <i>Advantages of Laparoscopic Approach</i> 207	
• <i>Disadvantages of Open Method</i> 207	
• <i>Transabdominal Preperitoneal Repair of Inguinal Hernia</i> 208	
• <i>Procedure of TAPP</i> 209	
• <i>Totally Extraperitoneal Hernia Repair</i> 213	
• <i>Advantage of TEP</i> 213	
• <i>Disadvantage of Preperitoneal repair</i> 213	
• <i>Laparoscopic Repair of Femoral Hernia</i> 216	
• <i>Complications of Laparoscopic Hernia Repair</i> 217	
• <i>Intraoperative Complications and Precaution</i> 218	
• <i>Postoperative Complications</i> 219	
• <i>Postoperative Recovery</i> 221	
• <i>Recurrence</i> 221	

• <i>Causes of Recurrence in Laparoscopic Inguinal Hernia Repair</i>	221
• <i>Recommendation</i>	222
17. Laparoscopic Repair of Ventral Hernia	225
• <i>Laparoscopic Anatomy</i>	226
• <i>Operative Procedure</i>	226
• <i>Choice of Mesh in Ventral Hernia</i>	230
• <i>Surgisis</i>	231
• <i>Aaloderm</i>	231
• <i>Proceed</i>	231
• <i>The Second Technique</i>	231
• <i>Complications</i>	232
• <i>Discussion</i>	232
• <i>Mesh Placement and Fixation</i>	233
• <i>Bowel Injury</i>	234
• <i>Adhesion</i>	235
• <i>Infection</i>	235
• <i>Seroma</i>	235
• <i>Postoperative Pain</i>	236
• <i>Obesity</i>	236
• <i>Recurrence</i>	236
18. Laparoscopic Repair of Hiatus Hernia	239
• <i>Symptoms of Type II Hiatus Hernia</i>	240
• <i>Operative Procedure of Giant Paraesophageal Hernia</i>	241
• <i>Recommendation to Avoid Complication</i>	241
19. Laparoscopic Repair of Duodenal Perforation	245
• <i>Laparoscopic Approach has Advantages</i>	246
• <i>Operative Technique</i>	246
• <i>Discussion</i>	248
20. Laparoscopic Fundoplication	251
• <i>Pathophysiology</i>	251
• <i>Operative Technique</i>	253
• <i>Procedure</i>	254
21. Sleeve Gastrectomy	262
• <i>Weight Loss</i>	270
22. Laparoscopic Splenectomy	274
• <i>Operating Room Set-up and Patient Position</i>	274
23. Laparoscopic Management of Hepaticopancreatic Diseases	281
• <i>Technique of Laparoscopic Management of Hydatid Cystic Liver</i>	281
• <i>Laparoscopic Liver Resection</i>	282
• <i>Hepatic Resections</i>	284
• <i>Laparoscopic Pancreatic Surgery</i>	286
• <i>Laparoscopic Pseudocyst Drainage</i>	289
24. Diagnostic Laparoscopy	292
• <i>Indications</i>	292
• <i>Contraindications</i>	293
• <i>Laparoscopic Anatomy</i>	293

• <i>Role of Laparoscopy in Ascites</i>	295
• <i>Diagnostic Laparoscopy</i>	299
25. Laparoscopic Small Bowel Surgery	304
• <i>Laparoscopic Resection of Small Bowel</i>	304
• <i>Ileocelectomy</i>	305
26. Laparoscopic Colorectal Surgery	310
• <i>Sigmoidectomy</i>	318
• <i>Low Anterior Resection</i>	330
• <i>Abdominoperineal Resection</i>	334
• <i>Hartmann Reversal</i>	336
• <i>Resection Rectopexy</i>	338
• <i>Wells or Marlex Rectopexy</i>	340
• <i>Tips and Tricks</i>	343
27. Laparoscopic Adhesiolysis	346
• <i>Contraindications</i>	346
• <i>Laparoscopic Adhesiolysis</i>	347



SECTION 3: LAPAROSCOPIC GYNECOLOGICAL PROCEDURES

28. Laparoscopic Sterilization	353
• <i>Laparoscopic Anatomy</i>	353
• <i>Contraindications</i>	354
• <i>Bipolar Coagulation</i>	355
• <i>Falope Ring Application</i>	355
29. Laparoscopic Ovarian Surgery	359
• <i>Laparoscopic Ovarian Anatomy</i>	359
• <i>Laparoscopic Management of Ovarian Cyst</i>	360
• <i>Laparoscopic Oophorectomy</i>	363
• <i>Contraindications</i>	363
30. Laparoscopic Tubal Surgery	368
• <i>Laparoscopic Tubal Anatomy</i>	368
• <i>Operative Procedure</i>	369
31. Laparoscopic Management of Ectopic Pregnancy	376
• <i>Ectopic Pregnancy</i>	376
• <i>Discussion</i>	379
• <i>Laparoscopy vs Laparotomy in Treatment of Ectopic Pregnancies</i>	380
32. Laparoscopic Surgery in Pregnancy: Precautions and Complications	381
• <i>Physiological Changes in Pregnancy</i>	382
• <i>Fetal Consideration</i>	383
• <i>Effects of Pneumoperitoneum in Pregnancy during Laparoscopic Procedure</i>	383
• <i>Criteria for Patient Selection</i>	383
• <i>Advantages of Laparoscopy in Pregnancy</i>	383
• <i>Discussion</i>	384

33. Laparoscopic Management of Endometriosis	388
• <i>Peritoneal Implants</i> 389	
• <i>Resection of Ovarian Endometriosis</i> 390	
• <i>Genitourinary Endometriosis</i> 391	
• <i>Gastrointestinal Endometriosis</i> 391	
• <i>Diaphragmatic Endometriosis</i> 391	
34. Laparoscopic Hysterectomy	392
• <i>Laparoscopic Anatomy of Uterus</i> 392	
• <i>Classification</i> 394	
• <i>Discussion</i> 399	
35. Laparoscopic Myomectomy	403
• <i>Procedure</i> 403	
• <i>Removal of Myoma</i> 404	
36. Laparoscopic Management of Stress Incontinence	408
• <i>Pathophysiology</i> 408	
37. Minimally Invasive Sling Operation for Stress Incontinence	413
• <i>Tension-free Vaginal Tape</i> 413	
• <i>Contraindications of Tension-free Vaginal Tape and Transobturator Tape</i> 418	
• <i>Warnings and Precautions</i> 419	
38. Laparoscopic Sacral Colpopexy	422
• <i>Indications</i> 422	
• <i>Operative Procedure</i> 422	
• <i>Vesicovaginal Fistula Repair</i> 424	
• <i>Technique</i> 424	
39. Essentials of Hysteroscopy	428
• <i>Indications</i> 428	
• <i>Contraindications</i> 428	
• <i>History</i> 428	
• <i>Delivery Devices</i> 428	
• <i>Distending Media</i> 428	
• <i>Fluid Monitoring</i> 428	
• <i>Excessive Fluid Absorption</i> 429	



SECTION 4: LAPAROSCOPIC UROLOGY

40. Ureteral Injury and Laparoscopy	443
• <i>Ureteral Injuries</i> 443	
• <i>Frequency of Ureteral Injury</i> 443	
• <i>Level of Ureteral Injuries</i> 444	
• <i>Prevention of Ureteral Injury</i> 444	
• <i>Recognition of Ureteral Injury</i> 445	
41. Laparoscopic Urological Procedure	457
• <i>Laparoscopic Nephrectomy</i> 457	
• <i>Laparoscopic Varicocelectomy</i> 458	

- *Laparoscopic Retroperitoneal Node Dissection* 459
- *Laparoscopic Management of Lymphoceles* 459
- *Laparoscopic Ureterolysis* 460
- *Laparoscopic Ileal Conduit* 460
- *Laparoscopic Pelvic Lymphadenectomy* 460



SECTION 5: PEDIATRIC LAPAROSCOPY

- 42. Laparoscopic Pediatric Surgery 465**
- *Laparoscopy in Infants and Children* 465
 - *Laparoscopic Repair of Pediatric Hernia* 468
 - *Laparoscopic Pediatric Urology* 470
 - *Laparoscopy for the Impalpable Undescended Testicle of Intersex Evaluation* 471
 - *Other Laparoscopic Pediatric Urological Procedures* 473



SECTION 6: MISCELLANEOUS

- 43. Other Minimal Access Surgical Procedures 481**
- *Two Port Cholecystectomy* 481
 - *Two Port Repair of Ventral Hernia* 486
 - *Historical Perspective* 492
 - *Surgical Technique* 493
 - *Minimal Access Neck Surgery* 496
 - *Minimal Access Surgery in Orthopedic Surgery* 499
 - *Arthroscopic Surgery in Sports Related Injuries and other Pathology* 500
 - *Minimal Access Surgery in Orthopedic Trauma* 501
 - *Spine Surgery and Arthroscopy* 502
 - *Bone Endoscopy and Tumors* 502
- 44. Minimal Access Bariatric Surgery 505**
- *Laparoscopic Treatment for Morbid Obesity* 505
 - *Sleeve Gastrectomy* 510
- 45. Complications of Minimal Access Surgery 513**
- *Anesthetic and Medical Complications in Laparoscopy* 513
 - *Hemorrhagic Complications* 519
 - *Gastrointestinal Complications* 522
 - *Injury to Bladder* 524
 - *Neurologic Injury* 526
 - *Dissection and Thermal Injury* 527
 - *Incisional Hernia* 527
 - *Infection* 528
- 46. Role of Training in Minimal Access Surgery 532**
- *Training—Objectives, Needs, and Means* 534
 - *Present Training in Laparoscopy* 534
 - *Learning Curve in Laparoscopy* 537

• <i>Definition and Description</i>	537
• <i>The Drawing of Learning Curves</i>	538
• <i>Factors Affecting Learning Curves</i>	538
• <i>Statistical Evaluation of Learning Curves</i>	538
• <i>Effect of Learning Curve on Randomized Controlled Trails</i>	539
• <i>Implications for Practice and Training</i>	539
• <i>What are the Limitations or Pitfalls?</i>	539
• <i>Ethical Dilemmas</i>	539
• <i>The Way Forward</i>	539
47. Minimal Access Robotic Surgery	542
• <i>Instruments of Robotic Surgery</i>	545
• <i>Instrumentation</i>	547
• <i>Instruments and Accessories</i>	548
• <i>Operating Room Configuration, Port Placement and Docking</i>	549
• <i>Robotic Cholecystectomy</i>	558
• <i>Segments of Robotic Cholecystectomy</i>	559
• <i>Docking and Operating Room Set-up</i>	559
• <i>Operative Technique</i>	560
• <i>Discussion</i>	564
• <i>Robotic Coronary Bypass Surgery</i>	565
• <i>Robotic Prostatectomy</i>	566
48. Transanal Endoscopic Microsurgery	569
• <i>Indications of Transanal Endoscopic Microsurgery</i>	570
• <i>Instruments</i>	570
• <i>Patient Positioning in Transanal Endoscopic Microsurgery</i>	570
• <i>Transanal Endoscopic Microsurgery Procedures</i>	572
• <i>Common Complications</i>	574
49. Future of Minimal Access Surgery	576
• <i>Minimal Access Techniques</i>	576
• <i>Natural Orifice Transluminal Endoscopic Surgery</i>	576
50. Troubleshooting and Checklist	580
Index	587