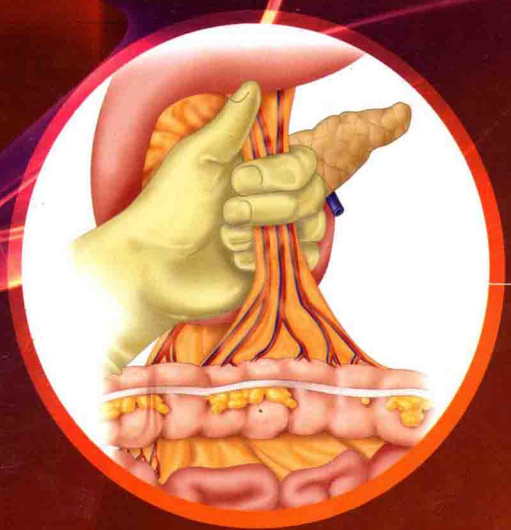

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Atlas of Surgical Techniques for the Colon, Rectum, and Anus

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Atlas of Surgical Techniques for the Colon, Rectum, and Anus

A Volume in the Surgical Techniques Atlas Series

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Foreword

"A picture is worth a thousand words."

This atlas is for the practicing surgeon, surgical residents, and medical students for review of and preparation for surgical procedures. New procedures are developed and old ones are replaced as technologic and pharmacologic advances occur. The topics presented are contemporaneous surgical procedures with step-by-step illustrations, along with preoperative and postoperative considerations as well as pearls and pitfalls, taken from the personal experience and surgical practice of the authors. Their results have been validated in their surgical practices involving many patients. Operative surgery remains a manual art in which the knowledge, judgment, and technical skill of the surgeon come together for the benefit of the patient. A technically perfect operation is the key to this success. Speed in operation comes from having a plan and devoting sufficient time to completion of each step, in order, one time. The surgeon must be dedicated to spending the time to do it right the first time; if not, there will never be enough time to do it right at any other time. Use this atlas; study it for your patients.

"An amateur practices until he gets it right; a professional practices until she can't get it wrong."

Courtney M. Townsend, Jr., MD
B. Mark Evers, MD

PREFACE

The idea to develop an atlas of the common operative procedures performed by colon and rectal surgeons was stimulated by a need to have a clear, pictorial reference for residents-in-training in colon and rectal surgery. As time constraints increase for residency training and opportunities to gain experience become less available during general surgical residency, colon and rectal surgeons are faced with a limited time to cover all aspects of colon and rectal surgery with trainees. This text, an atlas, relies on actual photographs of critical steps and critical views to instruct trainees step by step in the common operations performed for colorectal diseases.

My colleagues in the Section of Colon and Rectal Surgery at Washington University have contributed their expertise, time, and love of teaching to this project. For that, I am very grateful, and I am very proud that we could develop a tool that may improve our ability to reach our residents-in-training.

The use of an atlas for common colorectal operations should not be limited to colorectal residents-in-training but should be available to general surgery residents, who are also under the same time constraints. These operations are performed in almost every tertiary care institution across the country, where many of the training programs are found for both general surgery and colon and rectal surgery. It is our hope that this book will be used by trainers, educators, and program directors to improve the preoperative preparation of our residents. This preoperative preparation can enhance the intraoperative experience of the trainee and is therefore paramount to improving efficiency of training for the future. In a future edition, we hope to add more procedures and to enhance the current photographic atlas with a video atlas.

I would like to acknowledge the efforts of Dr. Jonathan Chun (during his clinical research fellowship) and Mr. Oscar Wolff in obtaining and categorizing the numerous photographs for this project. I would also like to acknowledge the extraordinary efforts and time dedicated to this project by Liz Nordike, our administrative assistant and office manager at Washington University. As always, each of us owes a great debt of gratitude to our families, who have tolerated our tardiness, physical absence, and sometimes mental absence during the writing of this book. We hope the residents of future generations find this helpful. Finally, we would like to thank Drs. Townsend and Evers for the concept and for their ongoing support for the atlas.

James W. Fleshman, Jr., MD

Contents

Atlas of
Surgical Techniques for the Colon, Rectum, and Anus

CHAPTER 1

Open Right Colectomy

Steven R. Hunt

Step 1: Clinical Anatomy

The right colon lies on the patient's right side suspended laterally by peritoneal attachments to the right side of the abdominal wall, superiorly by attachments to the undersurface of the liver and posterior diaphragm, and medially by its mesentery. The ileocolic artery and vein and the right colic vessels, if they are present, run through this leaf of mesentery. The colon is adherent to the retroperitoneum on the right side of the abdomen and covers the right gonadal vessels and right ureter. The inferior vena cava is the next most medial structure on the right side. The hepatic flexure, the fold at the junction between the right colon and transverse colon, is adherent to the anterior surface of the kidney by avascular attachments to Gerota's fascia. The first and second portions of the duodenum are adherent to the undersurface of the mesentery of the right colon and proximal transverse colon. The gallbladder is sometimes adherent to the cephalad surface of the transverse colon at the hepatic flexure. The space behind the right colon is triangular shaped with the flat horizontal surface at the hepatic flexure running from the abdominal side wall toward the midline along the line of the greater curve of the stomach. The vertical axis follows the right lateral side wall of the abdomen. The hypotenuse runs from the fusion plane of the cecum at the pelvic brim over the top of the right iliac artery and vein at about the point where the ureter passes over the iliac vessels toward the midline over the aorta up to the base of the pancreas along the third portion of the duodenum. This triangular retroperitoneal area is a potential space with avascular attachments and allows the right colon to be lifted completely from the retroperitoneum during dissection. Release of all suspensory attachments allows the right colon to be made into a midline structure. The ileocolic artery and vein arise from the superior mesenteric artery (SMA) and superior mesenteric vein in the midportion of the SMA below the duodenum. The right colic artery is a variable structure and may be present as a separate structure or as part of the ileocolic trunk. The right branch of the middle colic artery exits through the pancreatic tissue from its origin on the SMA as a portion of the middle colic trunk at the base of the transverse mesocolon (Figure 1-1).

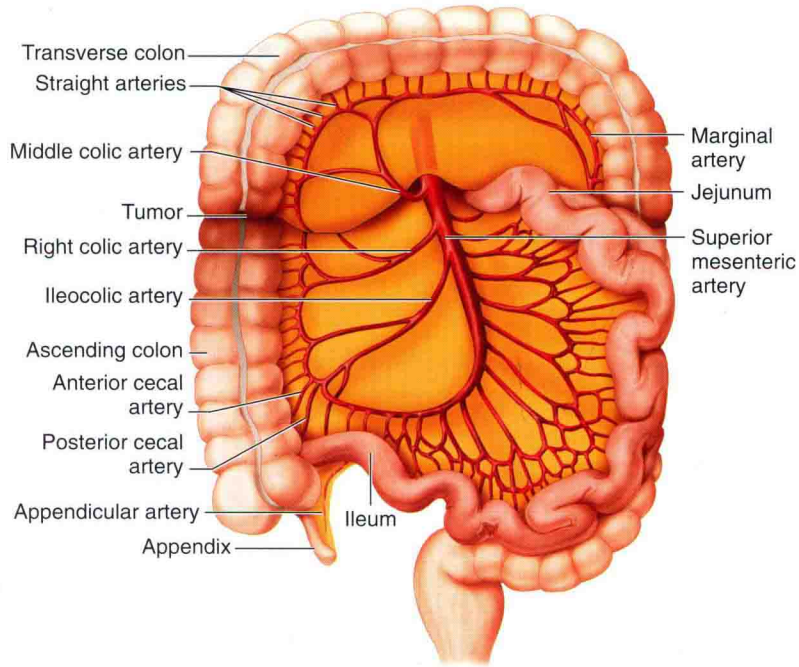

Transverse colon
Straight arteries
Middle colic artery
Tumor
Right colic artery
Ileocolic artery
Ascending colon
Anterior cecal artery
Posterior cecal artery
Appendicular artery
Appendix
Ileum
Marginal artery
Jejunum
Superior mesenteric artery

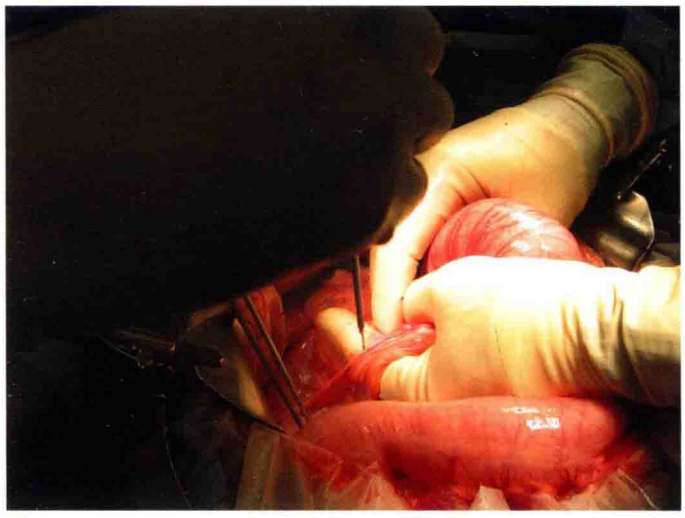
Figure 1-1

Step 2: Preoperative Considerations

Right colectomy is most commonly performed for neoplastic disease or inflammatory bowel disease, such as Crohn's disease. The patient requires very few preoperative preparations. Prophylactic antibiotics are appropriate for a colectomy to reduce the risk of wound infection. A mechanical bowel preparation is not necessary for a right colectomy. However, most patients seem to do better with clear liquids before an operation. Patients require routine deep vein thrombosis prophylaxis and instructions on postoperative care.

Step 3: Operative Steps

- The patient is placed in the supine position with sequential compression devices on the calves, Foley catheter in place, and the arms stretched to the side for access to the vessels and for blood pressure monitoring. General endotracheal anesthesia is required. An oral gastric tube helps decompress the stomach during the procedure.
- A vertical midline incision is made from the epigastrium to the mid low pelvis; a Bookwalter retractor (Codman, Raynham, Mass.) is placed for exposure with the abdominal incision stretched widely.
- The right colon is lifted from the pelvis, and a hand is placed from the medial aspect of the abdomen under the peritoneal attachments of the terminal ileum and right colon at the level of the pelvic brim and the white line of Toldt, or the peritoneal attachments along the right gutter are stretched over the index finger (Figure 1-2). The peritoneal attachments are incised with electrocautery to expose the duodenum at the base of the mesentery of the right colon. The right colon is lifted up and medially (Figure 1-3).
- The right colon is pulled toward the left leg, the space that has been generated over the top of the duodenum is developed bluntly up to the undersurface of the liver, and the suspensory peritoneal attachments along the base of the liver toward the gallbladder are incised with electrocautery (Figure 1-4).
- The attachments of the gastrocolic omentum are divided along the cephalad surface of the transverse colon outside the gastroepiploic arcade of the omentum between ties. The omentum is completely released, allowing the posterior aspect of the stomach and the entire lesser sac to be seen (Figure 1-5*A* and *B*).



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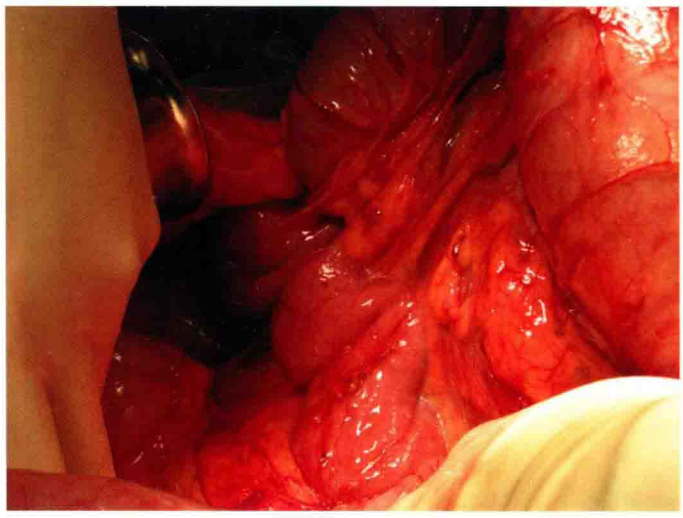

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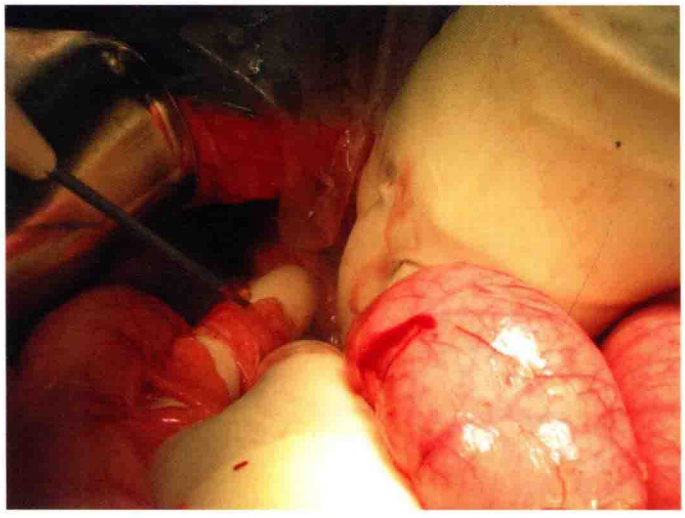

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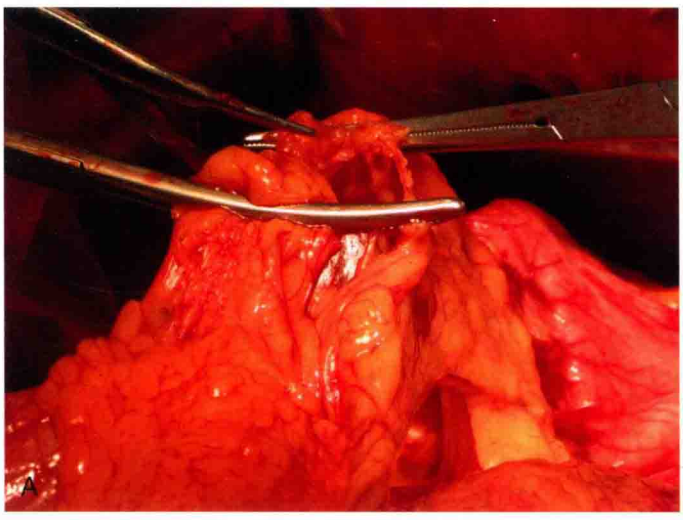

Figure 1-5A

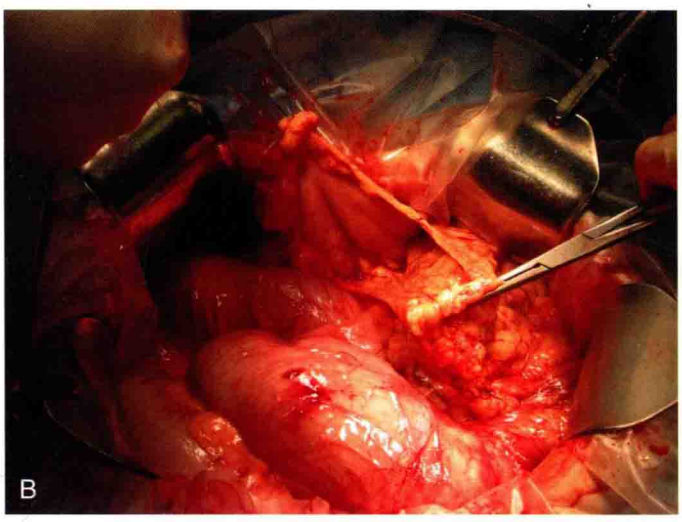

Figure 1-5B

- The colon is returned to its anatomic position with the right colon along the right gutter and the hepatic flexure up in the right upper quadrant. The SMA is identified in its tract to the terminal ileum; a window is seen in the base of the mesentery of the right colon proximal and distal to a large vascular trunk. This trunk is the ileocolic artery and vein arising from the SMA and superior mesenteric vein (Figure 1-6). An incision is made at the base of this window to expose and divide the ileocolic vessels at their origin (Figure 1-7).
- The vessels of the terminal ileal mesentery are divided; the terminal ileum is transected with a linear cutter stapler, and the transverse colon is divided in its proximal portion just distal to the hepatic flexure, also using a linear cutter stapler (Figures 1-8*A* and *B* and 1-9).