Open Left Colectomy

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Robert D. Madoff and Mark Y. Sun

Introduction

Surgical resection remains the foundation for curative treatment of colon cancer. A proper oncologic resection comprises: (1) a complete en bloc removal of the tumor along with any extracolonic involvement, (2) clear proximal, distal, and radial margins, and (3) an adequate clearance of locoregional lymph nodes. The manner in which the resection is performed may vary, e.g., laparoscopic vs. robotic vs. open, but the principles remain the same.

This chapter will specifically focus on open left hemicolectomy with emphasis on mobilization of the left colon, determination of an adequate lymphadectomy, and various reconstructive techniques to restore bowel continuity. We will highlight proper anatomic understanding of the vasculature and lymphatic drainage when approaching surgery in order to ensure a proper oncologic resection.

R.D. Madoff, M.D., F.A.C.S., F.A.S.C.R.S. (✉)
Division of Colon and Rectal Surgery,
Department of Surgery, University of Minnesota,
MMC 450, 420 Delaware St. SE, Minneapolis,
MN 55455, USA
e-mail: Madoff@umn.edu

M.Y. Sun, M.D.
Division of Colon and Rectal Surgery,
Department of Surgery, University of Minnesota
1055 Westgate Drive, Suite 190, Saint Paul,
MN 55114, USA
e-mail: msun@crsal.org

Indications

A left hemicolectomy is most commonly indicated for: (1) biopsy-proven malignancy, (2) endoscopically unresectable polyps, and (3) recurrent/high-risk polyps. In each of these circumstances an oncologic resection should be performed. In situations involving endoscopically unresectable polyps or high-risk polyps, a formal resection is still recommended because of the risk that the lesion may harbor an underlying malignancy.

Anatomic Considerations

The left colon can present unique surgical difficulties due to its inconsistent vascular supply. In general, the mid/distal transverse colon is supplied by the left branch of the middle colic artery, which is the first branch off the superior mesenteric artery. The descending colon is supplied by the left colic artery, which is the first branch off the inferior mesenteric artery. The sigmoid colon is perfused by multiple branches arising from the superior hemorrhoidal artery, which is the terminal branch of the inferior mesenteric artery. The area of the splenic flexure is supplied by a vascular arcade known as the marginal artery of

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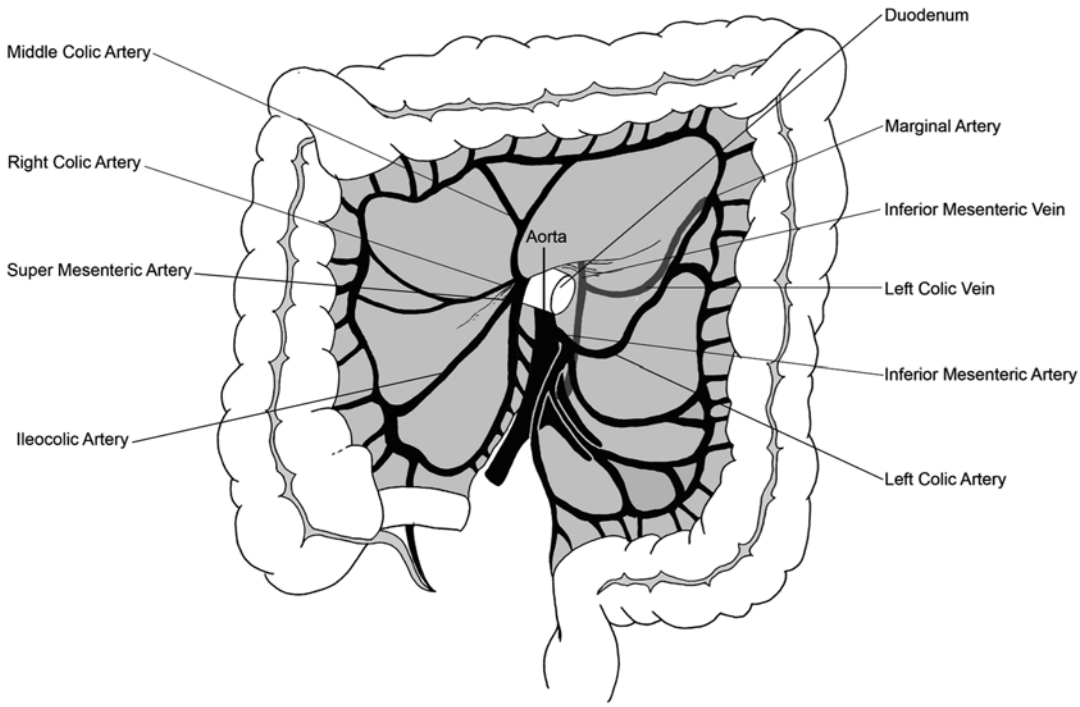

Fig. 18.1 This figure shows the major vessels of the colon that must be identified during open left colectomy. The marginal artery of Drummond is the collateral vessel between the superior and inferior mesenteric arteries

Drummond that acts as a collateral bridge between the superior and inferior mesenteric circulations (Fig. 18.1). Unfortunately, the marginal artery can be insufficient or absent in 4–20 % of cases, which is the reason this area of the colon is considered a watershed area [1]. This anomaly can become of clinical significance when the left colic or inferior mesenteric artery is ligated and one is planning to perform an anastomosis using the splenic flexure or descending colon. In this case, the absence of a marginal artery will lead to an inadequate blood supply to the proximal colon. Under these circumstances, an extended left hemicolectomy or a subtotal colectomy would be warranted.

The venous drainage mirrors the arterial supply. The small and intermediate veins eventually join to become the inferior mesenteric vein. The inferior mesenteric vein courses within the mesentery just lateral to the duodenum and eventually drains into the splenic vein. The splenic and superior mesenteric veins then merge to create the portal vein.

Lymphatic drainage follows the vascular supply. Colonic resection is often determined by the margins of devascularized colon following an adequate lymphadenectomy. As the lymphatics are thought to be an early site of tumor metastasis, it is imperative to have an appropriate sampling of paracolic and intermediate lymph nodes to be considered an adequate oncologic resection. A minimum retrieval of 12 lymph nodes has been adopted as a quality measure by many groups. However, node count is influenced not only by surgical technique, but also by adequacy of pathologic assessment, patient-related factors (e.g., age) and tumor-related factors (e.g., tumor location, T stage, or microsatellite status).

There is debate as to the extent of lymphadenectomy required for optimal oncologic clearance. Several authors have advocated the widespread adoption of “complete mesocolic excision” (CME) with anatomic dissection of the mesocolon along its embryological fascial planes and high ligation of the vascular pedicle (e.g., for left colon cancer, the origin of the inferior

mesenteric artery and vein). While excellent results have been reported by experienced CME surgeons, randomized trials comparing CME to conventional resection have not been performed.

Preoperative Management

A thorough preoperative workup is necessary to afford patients the greatest chance for a positive outcome following surgery. All patients should undergo a complete history and physical exam. All medical comorbidities should be optimized prior to surgery and any further cardiovascular or pulmonary workup should be performed when deemed appropriate.

If a complete colonoscopic evaluation was not previously performed, it should be done to rule out synchronous tumors and polyps. The tumor should be tattooed in at least 3 and preferably 4 quadrants to aid in intraoperative identification of the area in question. Tattooing becomes especially important when operating for smaller lesions or endoscopically unresectable/high-risk polyps. Basic lab work including hemoglobin, platelet count, comprehensive metabolic panel to check for renal and hepatic function, and carcinoembryonic antigen (CEA) should be performed. Not all colon malignancies will secrete CEA, but for those that do it is helpful in the surveillance of patients postoperatively as it is usually one of the first signs of recurrence.

A complete metastatic workup should also be performed consisting of a computed tomographic (CT) scan of the chest, abdomen, and pelvis with oral and intravenous (IV) contrast. If the tumor is found to be locally invasive, i.e., involving any surrounding organs or structures, preoperative consultation with surgical specialists would be beneficial to ensure that an en bloc, curative resection could be performed at the time of surgery. If there is any question to the resectability of a locally invasive lesion or if there are indeterminate hepatic lesions, a magnetic resonance imaging (MRI) scan can be helpful in aiding preoperative decision making.

If distant disease is identified and the patient is otherwise asymptomatic from the primary lesion, consideration should be given to systemic therapy with chemotherapy prior to surgery. In the situation of distant disease, overall survival will be tied to the effectiveness of systemic treatment and not to the resection of the primary tumor. After treatment with chemotherapy, restaging should be performed. For patients with resectable metastases, options include resection of the metastases first, resection of the primary first, or in patients with hepatic metastases, minimal medical comorbidities, and good performance status, a synchronous procedure to remove both the primary and metastatic lesions. Resection of the primary tumor in the face of unresectable metastases is a controversial issue, but in general, resection should be avoided unless the patient is symptomatic from the primary lesion or if there is clear evidence of impending obstruction.

The day prior to surgery the patient should be maintained on a clear liquid diet and consideration of a mechanical bowel preparation. There have been numerous studies to demonstrate the safety and potential benefits of performing elective colon resections without prior mechanical bowel preparation. However, in cases involving small tumors or malignant polyps, consideration should be given to mechanical bowel preparation to allow the possibility of performing intraoperative colonoscopy for possible localization of the lesion.

Perioperative Preparation

Prior to the patient being transferred into the operating room, a prophylactic dose of antibiotic as well as 5,000 units of subcutaneous heparin should be administered within 1 h of incision. Various antibiotic regimens are acceptable, but our preference is to use 1 g of IV ertapenem (Merck, Whitehouse Station, NJ) as it is a single dose that will last for 24 h. In addition, patients should be maintained with an active warming device in the preoperative area to achieve normothermia (>36 °C).

After the induction of general anesthesia, the patient is placed into a modified low lithotomy position. The arms are abducted in such a

position to allow for future placement of a self-retaining retractor. Care must be taken to ensure that both shoulders, elbows, and calves are appropriately positioned/padded to avoid positional neuropathies. A sterile Foley catheter and an orogastric tube are placed. The abdomen is then prepped with a chlorhexidine solution and towels are used to square off the operative field. A plastic adhesive is then placed over the abdomen to secure the towels in place. A "time out" is performed to confirm the patient's identity and the planned operation.

Incision

A midline laparotomy incision is made (Fig. 18.2). The extent of the incision will vary depending on the portion of the left colon being removed. For distal lesions, a lower midline incision down to the pubic bone may be sufficient. For proximal lesions near the splenic flexure, extension of the incision to the xiphoid process may be required. Once an adequate incision has been made, a plastic wound protector is placed

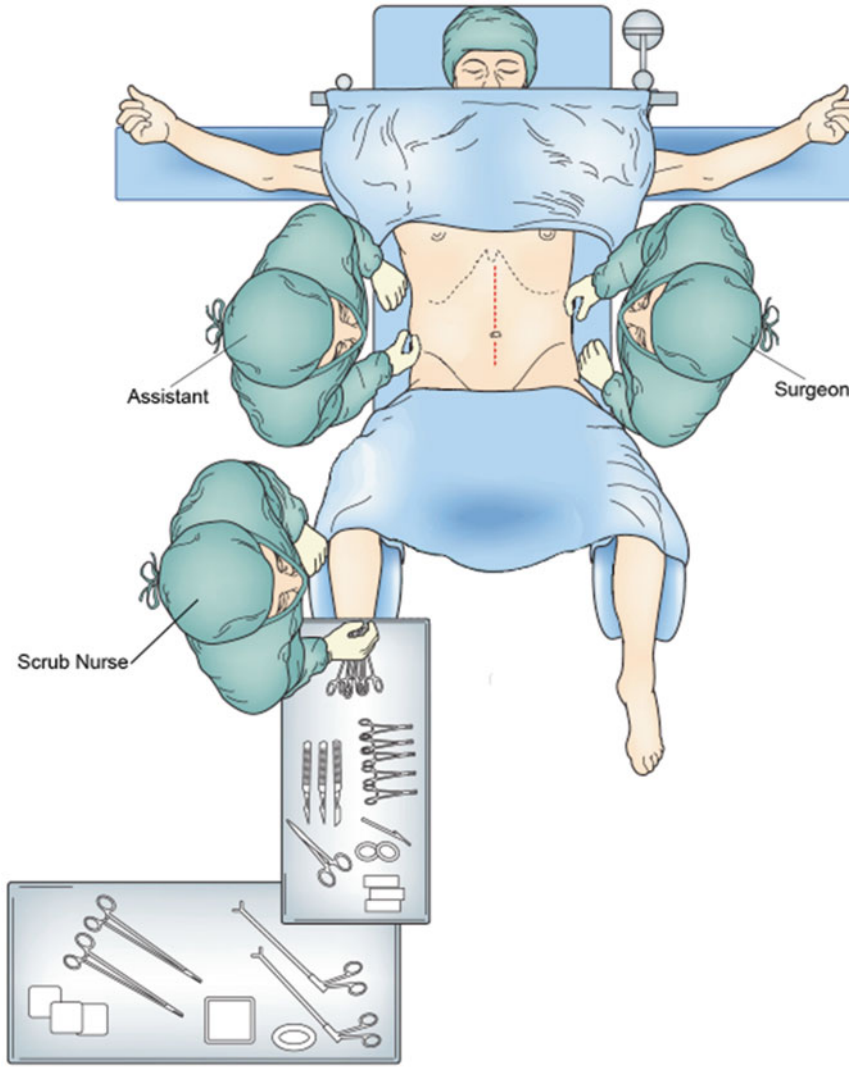

Fig. 18.2 The figure shows patient positioning for open left colectomy. The arms are abducted and the legs are placed in lithotomy position

into the wound to not only aid in prevention of contamination of the wound itself, but also to aid in maximizing the exposure for any given incision.

Examination of the Peritoneal Cavity

A complete abdominal exploration should then be undertaken to rule out the presence of metastatic disease as well as to confirm the location of the lesion in question. Both lobes of the liver should be palpated and the peritoneal surfaces visually inspected. Both ovaries should be inspected for possible metastatic disease. Unexpected masses/nodules should be biopsied and sent for frozen section. If carcinomatosis is encountered, closure of the abdomen and referral for either systemic therapy or heated intraperitoneal chemotherapy and tumor debulking may be warranted.

Once distant disease has been ruled out, a self-retaining retractor should be placed to maintain exposure. For distal lesions it is advantageous to keep the ring of the retractor close to the patient's skin and center the ring at the lower portion of the incision. For proximal lesions and splenic flexure mobilization it is helpful to position the ring more cephalad and to the left. It is often helpful during splenic flexure mobilization to place the ring at an angle, with the left/superior aspect of the ring elevated several inches off the abdominal wall to provide anterior retraction and improve visualization of the flexure. The surgeon should not hesitate to move the ring and reset the retractors to optimize exposure during various phases of the case. The small bowel is then packed into the right upper quadrant with moist laparotomy pads.

Extent of Resection

Once proper exposure has been established, it is necessary to determine the extent of resection that will be required. The lymphadenectomy will often times dictate the margins of resection. For splenic flexure lesions, proper lymphadenectomy will require ligation of the left branch of the middle colic artery at its base as well as ligation of the left colic artery as it takes off from the inferior mesenteric artery. For left colon cancers the left branch of the middle colic, left colic, and possibly the first sigmoidal branch need to be ligated depending on the location of the tumor. For sigmoid lesions the superior hemorrhoidal artery is ligated distal to the take-off of the left colic artery and the distal extent will be within the proximal rectal mesentery (Fig. 18.3). We do not advocate routine ligation of the inferior mesenteric artery itself, as there have been no studies to prove an oncologic benefit to a high ligation. Occasionally this may be necessary if a concerning lymph node is identified or to obtain adequate length for a tension-free

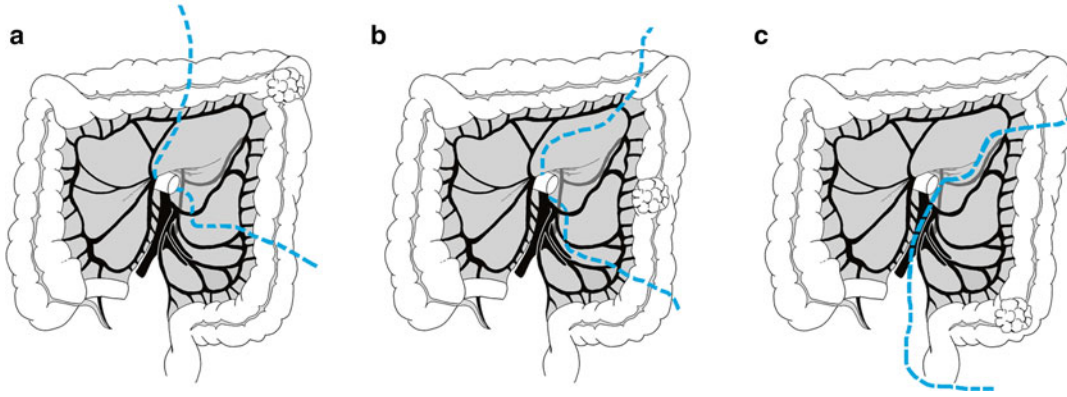

Fig. 18.3 The figure illustrates the extent of resection for (**a**) splenic flexure lesion, (**b**) descending colon lesion, and (**c**) sigmoid colon lesion

anastomosis. High ligation is also easier when the entire left side of the colon (including sigmoid) is being removed, such as in the case of synchronous lesions, uncertain location of a previously resected malignant polyp, or the presence of significant diverticular disease when operating for descending colon cancer.

Mobilization

The operating surgeon should stand on the patient's left side with the assistant either on the right side or between the legs. Mobilization should begin with separating the sigmoid colon from the retroperitoneum and left pelvic sidewall. The assistant begins by retracting the sigmoid colon medially while the operating surgeon dissects the sigmoid colon from the peritoneum using electrocautery. When performed properly, this will expose the peritoneal reflection along the sigmoid mesentery and lead to the avascular plane that will be carried up along the descending colon and eventually the splenic flexure. It is imperative to enter into the proper avascular plane as dissecting too deeply into the retroperitoneum could lead to troublesome venous bleeding or injury to the ureter. Once the gonadal vessels and left ureter are identified in the retroperitoneum, the peritoneum is then incised medially along the white line of Toldt to separate the lateral attachments of the left colon (Fig. 18.4).

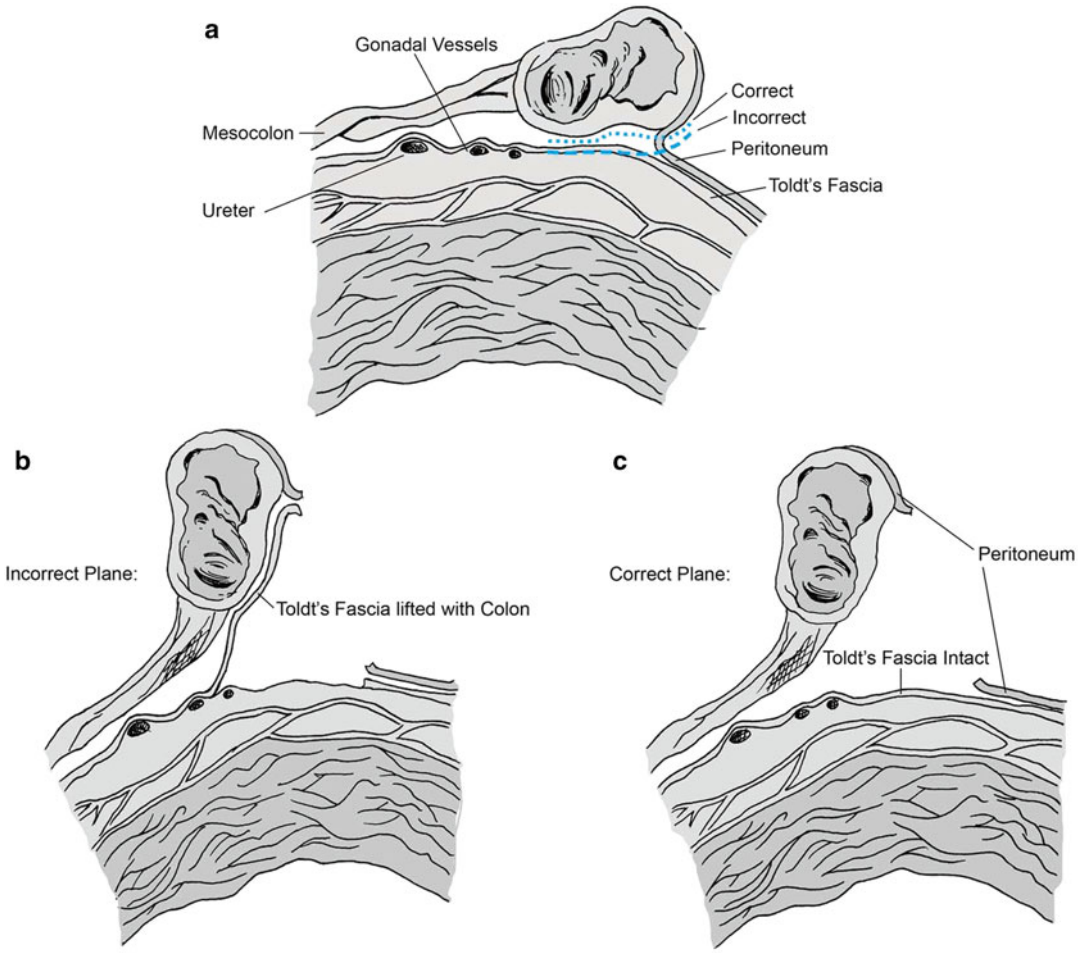

Fig. 18.4 Proper lateral dissection of the left colon requires careful dissection of the peritoneum from Toldt's fascia. (**a**) Correct and incorrect planes of resection. (**b**) The result of incorrect plane of resection. (**c**) The result of correct plane of resection

Once the peritoneum is incised, the mesentery of the sigmoid colon and left colon can often be dissected anterior to Toldt's fascia using a combination of gentle blunt dissection with a sponge stick and cautery. One should be aware when dissecting the left colon mesentery off of the retroperitoneum that it becomes quite thin at its base and it is easy to make a hole through the mesentery. Care must be taken that if a mesenteric defect is made that the small bowel is not injured on the other side. The gonadal vessels and left ureter should constantly be gently swept laterally to keep them out of the operative field. Once the mesenteries of the sigmoid and left colon are appropriately medialized, it can then be used as a fan retractor to keep the small bowel out of the way while mobilizing the splenic flexure.

After the sigmoid and left colon have been mobilized, the self-retaining retractor should be moved to the left upper quadrant to expose the splenic flexure. The separation of the lateral attachments is carried superiorly to the tip of the spleen. The operating surgeon then follows the wall of the colon using blunt finger dissection, exposing the splenocolic attachments for division by electrocautery or with a vessel sealing energy device. This maneuver is best performed with the surgeon positioned between the patient's legs and the first assistant on the patient's right side. The surgeon must take great care to avoid excessive traction on the colon, which can lead to splenic injury. If difficulty is encountered during the distal-to-proximal dissection, it is often helpful to work in the proximal-to-distal direction. The omentum is separated from the distal transverse colon to enter into the lesser sac. The remainder of the splenocolic attachments is then divided and the mesentery completely mobilized off the retroperitoneum. Full mobilization of the splenic flexure occurs once the tail of the pancreas is visualized at the base of the dissected mesentery.

Anastomosis: Colo-colonic

In all cases, we advocate complete mobilization of the colon along with division of the necessary mesentery prior to any division of the bowel wall. Once the mesentery and all the major vascular pedicles have been divided on both the proximal and distal ends, this will allow for demarcation of the colon prior to creation of the anastomosis. Once the proximal and distal resection margins have been chosen, those sites are then completely cleared of their remaining mesentery all the way down to the bowel wall. A decision for reconstructive technique of the anastomosis must then be made with the options being stapled vs. hand-sewn.

If a stapled anastomosis is chosen, our preference is to use an in-line technique to create a side-to-side functional end-to-end anastomosis (Fig. 18.5). Fully dividing the mesentery of the specimen first, and then aligning the bowel walls of the anastomosis obviates the risk of placing a twist into the remaining mesentery once the anastomosis is completed. Towels are then laid around the bowel to be resected to minimize contamination. Colotomies are then made along the antimesenteric taeniae of the proximal and distal colon, and positioned so that they will be eventually resected with the specimen. A gastrointestinal anastomosis (GIA) 75-mm stapler is then placed through the colotomies into both limbs of the proximal and distal bowel. The stapler is then fired to create the common channel of the anastomosis. On withdrawal of the stapler, the staple line is inspected for hemostasis. Allis clamps are then used to offset the staple lines as well as close the edges of the common colotomy in a transverse fashion. A thoraco-abdominal (TA) 90-mm stapler is then placed below the common colotomy in the area of the bowel that had been previously cleared of mesentery. The stapler is then fired and the specimen separated from the newly created anastomosis. Hemostasis of the transverse staple line is then controlled with suture ligatures. A 3-0 absorbable suture is then used to reinforce the crotch of the anastomosis.

Our preference is to use a hand-sewn end-to-end anastomosis unless there is a significant size discrepancy between the proximal and distal bowel. A hand-sewn anastomosis can be performed in either a 1-layer or 2-layer fashion. Our favored technique is a modified 1-layer anastomosis. The mesentery is completely cleared

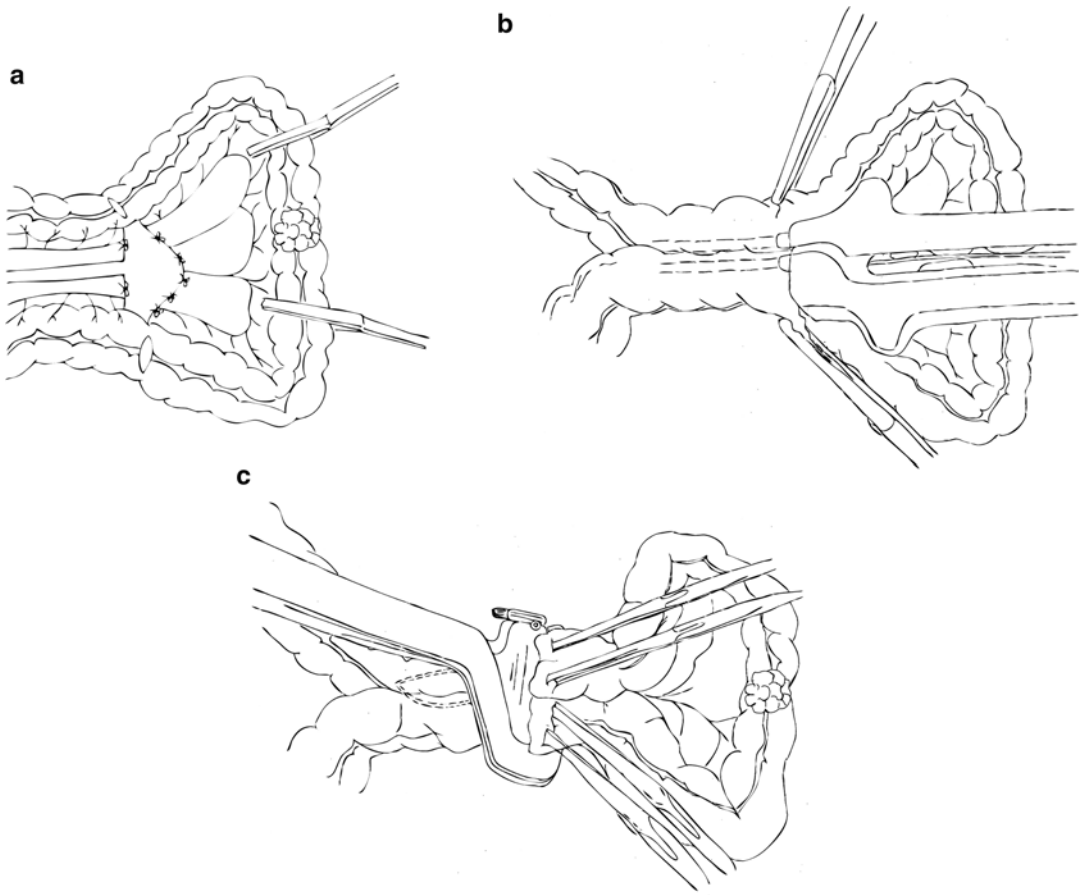

Fig. 18.5 The technique for stapled anastomosis. (**a**) The mesentery is fully divided and colotomies are made along the anti-mesenteric taeniae of the proximal and distal colon. (**b**) A linear stapler is placed through the colotomies and fired to create the anastomosis. (**c**) A TA stapler is used to divide and close the colon

down to the bowel wall at the site of the proximal and distal resection just like with a stapled anastomosis. At both the proximal and distal resection sites, the bowel wall is clamped on the patient side with a noncrushing clamp (e.g., Dennis clamp) and with a crushing clamp (e.g., Kocher clamp) on the specimen side. The Dennis clamp is closed only 1-click to minimize trauma to the bowel wall. The specimen is then separated from the patient by cutting between the Dennis and Kocher clamps with a knife. It is important not to cut directly on top of the Dennis clamp but instead to leave a small 1–2 mm cuff of colon on top of the clamp so that the bowel does not slip through. The Dennis clamps are then arranged to approximate the two ends of the bowel to be anastomosed (Fig. 18.6). A seromuscular Lembert stitch of 4-0 silk is then placed on either corner of the bowel and secured, untied, with a hemostat to maintain orientation. Interrupted 4-0 silk Lembert stitches on a small (i.e., RB-1) needle are then placed along the antimesenteric side of the bowel. When placing this row of stitches, it is suggested to serially bisect the anastomosis to ensure that the stitches are all evenly spaced. The stitches are placed 6–8 mm apart and all of these stitches are left untied. Once the antimesenteric side is completed, the Dennis clamps are rotated 180° to expose the mesenteric side of the anastomosis. At this point the small 1–2 mm cuff of colon that was previously left on the Dennis clamp is

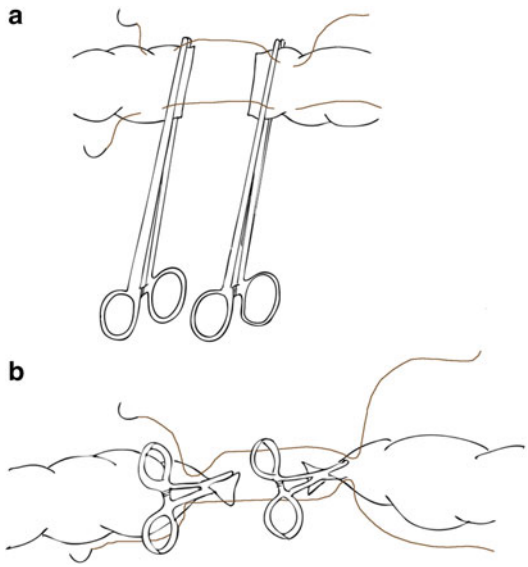

Fig. 18.6 The technique for handsewn one-layer anastomosis. (**a**) Dennis clamps are used to align the two ends of the colon and seromuscular interrupted sutures are placed. (**b**) Transverse view of the alignment of the Dennis clamps and placement of sutures

trimmed flush to the clamp so that the eventual anastomosis is well opposed. We then place another row of 4-0 interrupted silk stitches in the same manner. Once the mesenteric side is completed, the Dennis clamps are then removed and the lumen of both sides of the colon are opened to make sure none of the stitches caught the back wall. All of the 4-0 silk stitches are then tied down and the tails are left long. We then use a 4-0 double-armed absorbable stitch to sew around the entire anastomosis in a full-thickness running fashion, using the silk suture tails to elevate the portion of bowel being sewn. The use of a double-armed stitch allows the surgeon to sew in both directions along the anastomosis. When placing this stitch, the previously placed silk stitches are essentially ignored and the running stitch is placed as if one were performing a routine 1-layer anastomosis. Our rationale for this modified 1-layer approach is that the first layer of 4-0 silk stitches inverts the bowel ends and lines them up to make it easier to perform an even, well-spaced 1-layer anastomosis.

Anastomosis: Colo-rectal

For tumors in the mid to distal sigmoid colon, an end-to-end stapled anastomosis is our reconstruction method of choice. Again, the entire mesentery of the specimen is divided prior to transecting the bowel wall, and the bowel ends are cleared of fat. We find it is generally easier to eventually pass the circular stapler if the upper portion of the rectum is mobilized. Once the resection margins have been cleared, a decision must be made to either perform a double-stapled end-to-end anastomosis or a double-purse-string end-to-end anastomosis. Our preference is to perform a double-purse-string anastomosis to avoid crossing staple lines. However, if the anastomosis sits too low in the pelvis to comfortably sew a purse-string stitch or there is significant size mismatch of the proximal colon and the distal rectum, then a double-stapled technique is employed.

In order to perform a double-purse-string anastomosis, the proximal resection margin is clamped with a Dennis clamp on the patient side and a Kocher clamp on the specimen side. The specimen is then cut between the two clamps with a knife. Two right-angled Glassman clamps are then placed on the distal resection margin. Prior to division of the distal resection margin, a dilute betadine solution is used to irrigate the rectum to clear it of any remaining fecal material. Once the rectum is cleared, the specimen is then removed by cutting between the two Glassman clamps. The distal Glassman clamp is then removed and a 2-0 double-armed prolene stitch is then used to create a purse-string stitch around the rectum in a running baseball fashion. The purse-string is then pulled tight to help prevent contamination and the two ends of the stitch are secured with a hemostat. Attention is then turned to the proximal portion of the anastomosis. A second 2-0 double-armed prolene suture is again used to create another purse-string stitch in the proximal bowel in the same manner. The purse-string is again pulled tight to prevent fecal contamination. The assistant then goes between the legs in order to pass the circular stapler up the rectum. We recommend passing the entire stapler up the rectum intact with

the anvil attached. The smooth edges of the anvil help ease the stapler to the top of the rectal stump without getting caught on the rectal valves. If there is difficulty advancing the stapler all the way to the top of the rectal stump, the operating surgeon can place a finger into the rectum from the top of the rectal stump to help guide the stapler into proper position. Once it is at the top of the rectal stump, the stapler is then opened by the assistant and the anvil is advanced into the abdomen under direct vision. The operating surgeon then removes the anvil from the post of the stapler and secures the distal purse-string stitch around the stapler. The anvil is then placed into the proximal bowel and secured in place with the other previously placed purse-string stitch. The anvil and the post of the stapler are then reunited and then closed under direct vision. Care must be taken that the orientation of the proximal bowel is such that the proximal mesentery is not twisted and no epiploicae are pulled into the anastomosis. In women, it is also important to ensure the vagina is free of the stapler prior to firing. The stapler is then fired, released, and removed. The integrity of the anastomotic donuts is then inspected to ensure that they are complete. A rigid proctoscopy is then performed to check the anastomosis for hemostasis as well as to perform a leak test.

A double-stapled anastomosis is performed in a similar fashion. Once the proximal and distal resection sites have been cleared of mesentery, the proximal margin is again clamped between a Dennis clamp on the patient side and a Kocher clamp on the specimen side. The proximal margin is then cut between the two clamps with a knife. A TA 45-mm stapler is then used to secure the distal resection margin and fired to completely separate the specimen. A 2-0 double-armed prolene stitch is then used to create the purse-string in the proximal bowel and the anvil of the circular stapler is secured in place. The assistant then goes between the patient's legs and the stapler is passed to the top of the rectal stump under the guidance of the operating surgeon. Once the stapler is felt to be flush and centered with the transverse staple line, the post of the stapler is advanced through the top of the rectal stump. The anvil is then reunited with the stapler and the anastomosis completed in the same fashion as previously described.

Postoperative Care

The orogastric tube is removed prior to extubation. If there were previous signs of obstruction, the orogastric tube can be converted to a nasogastric tube. The patient should then be maintained on a crystalloid fluid for the first 24–48 h until the initial resuscitation is completed. Strict monitoring of both intake and output is vital to ensure adequate tissue perfusion. Intravenous fluids should be minimized as much as possible to avoid bowel edema and the chances of postoperative ileus. Prophylactic subcutaneous heparin (5,000 units Q8h) is continued on the day of the operation as long as bleeding is not a major concern. Postoperative pain can be managed with either an epidural or a patient-controlled analgesia (PCA) pump. Use of nonnarcotic analgesics can also be helpful to minimize the chances of postoperative ileus. Ambulation as well as incentive spirometry is encouraged to begin on postoperative day #0. If a beta-blocker was used preoperatively, this should be continued intravenously until intestinal function returns. No further antibiotic prophylaxis is warranted 24 h postsurgery.

On postoperative day #1, the diet is advanced to clear liquids as long as there is no nausea or vomiting. The urinary catheter is also removed as long as the urine output is adequate; the presence of an epidural is only a relative indication for continuation of the catheter. Urinary retention rates remain <10 % even in the presence of a thoracic epidural [2]. Once the patient begins passing flatus, the diet can be advanced to a soft mechanical/low-fiber diet. Medications are all transitioned to the oral route and the patient is prepared for discharge home.

A postoperative fever must always raise concern for abdominal abscess or possible anastomotic leak. Urinary, pulmonary, and wound complications are certainly more common causes of fever, but an anastomotic leak is always something to be considered due to the potential severity of its consequences. If there is suspicion for a leak, a CT of the abdomen/pelvis or a water-soluble contrast enema should be performed. Performing a CT prior to postoperative day 5 is generally not recommended as the postsurgical

artifact is such that it makes interpretation difficult, though we do not hesitate to obtain an earlier scan if clinical circumstances warrant it. The grade of anastomotic leak will determine management. If the patient remains hemodynamically stable and tissue perfusion remains adequate, consideration to bowel rest, IV antibiotics and possibly a percutaneous drain can be a reasonable alternative. If fevers persist, abdominal pain worsens, or hemodynamic instability develops, immediate operative reexploration should be undertaken and most often results in a diverting stoma along with wide abdominal drainage. The type of diversion depends upon the size and location of the leak. Complete or near-complete disruptions at any level generally require complete takedown of the stoma with Hartmann closure and proximal end colostomy. Minor leaks, especially in the low pelvis, are often best treated with washout, drainage, and proximal loop ileostomy.

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Key Operative Steps

1. A midline laparotomy incision is made.
2. Begin mobilization by separating the sigmoid colon from the retroperitoneum and left pelvic sidewall. Expose the peritoneal reflection leading to the avascular plane that runs from the sigmoid mesentery up to the splenic flexure.
3. Once the gonadal vessels and left ureter are identified, then incise the white line of Toldt to separate the lateral attachments of the left colon.
4. The mesentery of the sigmoid and left colon can be dissected anterior to Toldt's fascia.
5. Perform takedown of the splenic flexure and visualize the tail of the pancreas.
6. The extent of resection will depend on the location of the tumor. For splenic flexure lesions, ligate the left branch of the middle colic artery and left colic artery. For left colon cancers, the left branch of the middle colic, left colic, and first sigmoidal branch are ligated. For sigmoid lesions, the superior hemorrhoidal artery is ligated distal to the takeoff of the left colic artery.
7. Divide the mesentery prior to division of the bowel wall to allow for demarcation.
8. Perform stapled anastomosis by dividing the mesentery first. Align the bowel walls and create colotomies along the antimesenteric taeniae of the proximal and distal colon. Use a GIA stapler for the anastomosis. Use a TA stapler to divide and close the colon.
9. Perform hand-sewn anastomosis in a 1-layer fashion. Align the ends of the colon with Dennis clamps and use interrupted seromuscular sutures to create the anastomosis.
10. For distal tumors consider using a circular stapler for the anastomosis.