Laparoscopic Low Anterior Resection

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Indication

- Rectal adenocarcinoma.

Essential Steps

1. Preoperative bowel preparation, including PO antibiotics
2. Lithotomy position, both arms are tucked.
3. Foley catheter and orogastric tube.
4. If not tattooed prior to surgery, perform rigid proctosigmoidoscopy to identify 2 cm distal to the tumor.
5. Placement of trocars:
   - Periumbilical Hasson port
   - Two 5-mm trocars in the right upper and left lower quadrant.
   - One 12-mm trocar in the right lower abdomen (site for diverting ileostomy if needed).
6. Explore the abdomen for evidence of metastatic disease.
7. Place the operating table in Trendelenburg position.
8. Isolation of the inferior mesenteric artery (IMA) with a medial to lateral dissection. Identification and protection of the left ureter with a high ligation of the IMA.
9. Incise the white line of Toldt to mobilize the descending colon.
10. Retract the rectum and mesorectum anteriorly and perform a posterior mesorectal dissection with electrocautery or an energy device.
11. Identify, isolate, and protect the hypogastric nerves.
12. In a female, a stitch may be placed in the uterus to fix the uterus to the anterior abdominal wall if the uterus obstructs the anterior plane of dissection.
13. The dissection is performed circumferentially.
14. Take down the lateral attachments of the rectum avoiding injury to the hypogastric nerves within the lateral stalks.
15. Open the peritoneal reflection anteriorly, staying behind Denonvilliers' fascia, avoiding injury to the prostate and seminal vesicles in males and to the uterus and vagina in females.
16. Dissect posteriorly close to the posterior colonic wall along Waldeyer's fascia, avoiding injury of the sacral venous plexus.
17. Divide the rectum using a reticulated laparoscopic stapler at a point distal to the mass in order to obtain adequate margins.

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18. Create a Pfannenstiel incision, and place a wound protector.
19. Exteriorize the sigmoid colon and the rectum through the incision.
20. Divide the mesentery of the sigmoid colon.
21. Divide the colon at the level of the sigmoid. Send the specimen to pathology and check for adequacy of the distal margin (at least 1 cm distal margin for a super low tumor, 2 cm for a low rectal cancer).
22. Perform a rectal exam, dilate the anus, and measure the adequate diameter with sizers before choosing the size of the circular stapler.
23. Open the staple line of the proximal colon. Secure the anvil with a double purse-string stitch.
24. Perform a side-to-end or end-to-end anastomosis using the circular end-to-end anastomosis (EEA) stapler. (Make sure the mesentery is not twisted and the anastomosis is without tension).
25. Perform a rigid proctosigmoidoscopy and check the anastomotic line. Test the anastomosis with air insufflation, with the pelvis filled with saline.
26. Identify the ileocecal valve at this time.
27. If *ileostomy* is *elected* (*usually for a low colorectal/coloanal anastomosis*):
    - Run the small bowel proximally and identify a point around 40 cm proximal to ileocecal valve.
    - Use the 12-mm trocar site to construct an ileostomy site (site previously marked by an enterostomal nurse) and exteriorize the small bowel.
    - Relieve any tension or twist in the mesentery of the small bowel.
    - Mature the loop ileostomy in regular fashion.
28. Check for adequate hemostasis and suction all fluid in the pelvis. Place a drain in the pelvis if dissection is below the peritoneal reflection.
29. Remove all trocars under direct vision.
30. Close the Pfannenstiel incision.
31. Close skin with a running subcuticular Monocryl suture at all trocar sites and deep dermal interrupted buried knot sutures at the Pfannenstiel incision.
32. Apply a dressing and stoma appliance.
33. Extubate patient and transfer to PACU.

Note These Variations

- Cystoscopy with placement of bilateral ureteral stents by urology.
- Hand-assisted low anterior resection with a hand port established at the beginning of the operation through either a Pfannenstiel incision or a low midline incision.
- IMA and IMV may be divided at the beginning of the procedure, and the dissection can be carried medially up to the level of the splenic flexure.
- If more length is needed or if the anastomosis is under tension, the IMA/IMV may be divided and/or the transverse colon can be further mobilized in this situation.
- The diverting loop ileostomy is used for low colorectal/coloanal anastomoses.

Complications

- Injury to small bowel
- Injury to both ureters
- Laceration of the spleen or tail of the pancreas
- Injury to the hypogastric nerves
- Injury to the posterior wall of the vagina
- Anastomotic leak
- Bleeding from the presacral venous plexus
- Injury to left common iliac vessels
- Injury to the rectum itself
- Sexual dysfunction
- Urinary retention
- Stoma-related complications

Template Operative Dictation

Preoperative Diagnosis Rectal cancer s/p neoadjuvant chemoradiotherapy

Procedure (Rigid sigmoidoscopy) laparoscopic low anterior resection with colorectal stapled anastomosis. *Diverting loop ileostomy*

Postoperative Diagnosis Same

Indications The patient is ___-year-old *male/female* with a history of _____. Different treatment options were discussed with the patient. The procedure of laparoscopic (possible open) lower anterior resection was reviewed with the patient. The procedure, indication, alternatives, benefits, risks, and complications were reviewed with the patient. The patient verbalized understanding and wished to proceed. Informed consent was obtained.

Description of Procedure The patient was brought to the operating room. Time-outs were performed using both preinduction and preincision safety checklists to verify correct patient, procedure, site, and additional critical information prior to beginning the procedure.

After inducing general endotracheal anesthesia; *he/she* was placed in lithotomy position with both arms tucked. Intravenous antibiotic and subcutaneous heparin were administered. An orogastric tube was inserted. All extremities were properly padded. The rectum was irrigated with normal saline and betadine. The abdmoen was prepped and draped in usual sterile fashion.

If ureteral stent: *Urology performed cystoscopy with placement of bilateral ureteral stents. Please see Dr. [Urologist's name] procedure note for further details of the procedure*.

A periumbilical Hasson port was used to access the peritoneal cavity and secured with an 0 Vicryl U stitch through the fascia. The abdomen was insufflated to 15 mmHg carbon dioxide pneumoperitoneum. The abdominal cavity was explored to rule out any metastatic disease. The liver and peritoneum were examined and no metastasis was identified. Subsequently, two 5-mm trocars were inserted in the right upper quadrant and in the left lower quadrant under direct visualization as well as a 12-mm trocar in the right lower quadrant. The patient was placed in a Trendelenburg position with the right side down. The sigmoid colon was grasped and retracted anteriorly and laterally. The inferior mesenteric artery pedicle was identified, and the peritoneum of the sigmoid mesentery was incised from the sacral promontory, superiorly to the inferior mesenteric artery. A medial to lateral dissection was performed to identify the left ureter, and the ureter was protected from harm's way. The inferior mesenteric artery was isolated and divided as a high ligation, using the laparoscopic *LigaSure/laparoscopic vascular stapler/different energy source/clip*. The left mesocolon was then lifted off the retroperitoneum from a medial to lateral approach, and blunt dissection was carried out toward the splenic flexure. The left colon was mobilized from a lateral to medial approach by incising the lateral attachments at the white line of Toldt. The patient was placed in reverse Trendelenburg position. The splenic flexure was taken down by dividing the splenocolic ligament.

Next, the posterior dissection of the rectum was done in the presacral space using *electrocautery/other energy device* until the levator ani muscles to complete the posterior portion of total mesorectal excision (TME) (if a low rectal tumor). Lateral dissection was performed along the right and left pelvic sidewalls. Care was taken to avoid injury to the ureters. The sacral promontory was visualized, and both hypogastric nerves were identified and protected. Using blunt dissection and electrocautery, the presacral avascular plane was developed close to the posterior rectal wall along Waldeyer's fascia. The lateral attachments of the rectum were divided. The peritoneal reflection was opened anteriorly and dissection was carried posterior to Denonvilliers' fascia. The mesentery of the rectum was taken down with a thermal device about 2 cm inferior to the tumor height.

The rectum was divided using a laparoscopic stapler. Following that a 4–6 cm Pfannenstiel incision was created. The specimen was exteriorized through the Alexis wound retractor at the incision. The sigmoid was divided with the *stapler/sharply with electrocautery*. Sizers were used to measure the diameter of the rectum and a 29-mm EEA stapler was used. A double purse-string suture was used to secure the

anvil at the distal aspect of the sigmoid colon. A *side-to-end/end-to-end* stapled anastomosis was performed using the 29-mm EEA stapler. Donuts were inspected and found to be intact. The anastomosis was checked for leak using air insufflation test while performing a rigid sigmoidoscopy to visualize the anastomosis. At the end of the anastomosis, the mesentery was without twist or tension.

If diverting loop ileostomy: *The ileocecal valve was identified. The small bowel was run, and at a point 40 cm from the ileocecal valve, the small bowel was exteriorized through the right 12-mm trocar site. A loop ileostomy was fashioned matured using 3-0 Vicryl sutures*.

Hemostasis was assured. All trocars were removed under direct visualization. Closure of the Pfannenstiel incision was performed in layers with 0 Vicryl to close the peritoneum and a #1 running loop PDS for the fascia. The skin was closed using 3-0 Vicryl deep dermal interrupted stitches. 4-0 Monocryl deep dermal interrupted stitches were used to close the port sites. Skin glue was applied to the port sites, and sterile dressings were applied to the Pfannenstiel incision. An ostomy appliance was placed. All instrument, needles, and sponge counts were correct times two. A debriefing checklist was completed to share information critical to postoperative care of the patient. The patient tolerated the procedure well, was extubated, and was taken to the recovery unit in stable condition.

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