

STAPLED GI ANASTOMOSIS

I. OBJECTIVES

By the end of this laboratory session participants should be able to...

- 1) Identify types of Gastrointestinal stapling devices and principles of their use.
- 2) Perform anatomic side-to-side (functional end-to-end) stapled anastomoses.
 - a) colocolic
 - b) enterocolic
 - c) enteroenteric
- 3) Perform simulated end to end anastomoses with the circular stapler
 - a) using double staple technique
 - b) using distal handsewn pursestring

II. ASSUMPTIONS

Review principles of mechanical sutures in operation on the alimentary tract as enclosed in the suggested readings.

III. SUGGESTED READING

Please read the enclosed reviews "Operations on the Small and Large Intestine," from *Mastery of Surgery* by Nyhus and Baker, 2nd edition.

Steichen, FM. Mechanical Sutures in Operations on the Alimentary tract. In Lloyd M. Nyhus and Robert J. Baker (eds). Mastery of Surgery. Boston/Toronto/London: Little, Brown, and Company, 1992. Pages 455-474.

Review surgical anatomy of the small and large intestine as enclosed in the suggested readings.

Healey, John E, Jr., M.D. and Joseph Hodges, M.D., *Surgical Anatomy*. Toronto/Philadelphia: B.C. Decker Inc., Publisher, 1990. Pages 190-197.

IV. ANATOMICAL CONSIDERATION

See assumptions

V. DESCRIPTION OF LABORATORY MODULE

After a 15 minute overview, participants will rotate through the following two stations,

Station 1) enteroenterostomy: anatomic side-to-side and functional end-to-end anastomosis.

- a) colon-colon
- b) small bowel-small bowel
- c) small bowel-colon

Station 2) End to end anastomosis with circular stapler

- a) using double staple technique
- b) using distal handsewn pursestring technique

Each station will take approximately 45 minutes.

VI. DESCRIPTION OF TECHNIQUE/PROCEDURE

I. Anatomic side-to-side (functional end-to-end) anastomosis.

Technique

- 1) Circumferentially clear of fat from the intended areas of bowel division.
- 2) Resect intended lesion/area.
- 3) Align the antimesenteric borders, stapled ends together.
- 4) Place a crotch stitch 6-8 cm from the stapled ends just lateral to the antimesenteric border, taking care to rotate the antimesenteric borders toward one another.
- 5) Cut off antimesenteric corner of each staple line.
- 6) Insert one fork of GIA-type stapler into each limb.
- 7) Close stapler, taking care to align antimesenteric borders and exclude mesentery/adjacent tissues. Fire stapler smoothly, moving only the trigger and not the body of the stapler.
- 8) Remove the forks of the stapler. Inspect the staple line for bleeding.
- 9) Use allis clamps to close resultant enterotomy, ensuring that the staple lines just performed, are not in contact
- 10) Apply the TA-type stapler beneath the allis clamps and fire.
- 11) Excise excess tissue before removing TA stapler. Inspect staple line for adequacy of hemostasis.
- 12) Close mesenteric defect.

*Refer to the figures in the suggested reading.

II. End-to-end anastomosis: simulated colorectal anastomosis.

- 1) Curcumferentially clear of fat, the intended aras of bowel division.
- 2) Either A) place automatic pursestring across proximal part of colon with straight bowel clamp just distal and divide colon

- sharply, or B) use GIA stapler to divide colon, excise proximal staple line, and place handsewn pursestring.
- 3) Use allis clamps to grasp edges of colotomy for anastomotic sizing.
 - 4) Place chosen anvil into lumen and tie pursestring.
 - 5) Place TA stapler across the point chosen for division of the rectum. Place angled Hayes clamps proximally for bowel control.
 - 6) Fire TA stapler and sharply divide rectum. Remove specimen.
 - 7) A) For double stapled technique, pass circular stapler per rectum to end of rectal stump. Advance spike completely.
B) For handsewn pursestring, excise TA staple line. Place handsewn pursestring at divided edge of rectum. Have assistant pass circular stapler per rectum, tie pursestring around spike shaft. Advance spike completely.
 - 8) Place anvil on spike, close stapler, and fire.
 - 9) Partially open stapler, gently disengage from anastomosis and remove. Inspect donuts for completeness.

*Refer to the figures in the suggested reading.

VII. EQUIPMENT NEEDED

- Seven 28cm segments of pig bowel per station
- Kocher clamps, 2 per station
- Non crushing intestinal clamps, 4 per station
- hemostats, 4 per station
- Metz scissors
- Debaquey forceps and needle drivers
- Scalpels and blades
- Suture material: 3-0 silk popoff and 2-0 surgipro
- Babcocks clamps, 4 per station
- Allis clamps, 4 per station
- Curved Mayo scissors
- Universal GIA 60, with 2.5mm loads, 2.0 loads, and 3.5 loads
- TA 60
- EEA
- Gloves

VIII. References

Syllabus of Southern Illinois Department of Surgery Skills Lab. Jan Rakinic, MD. Used with permission from SIU.