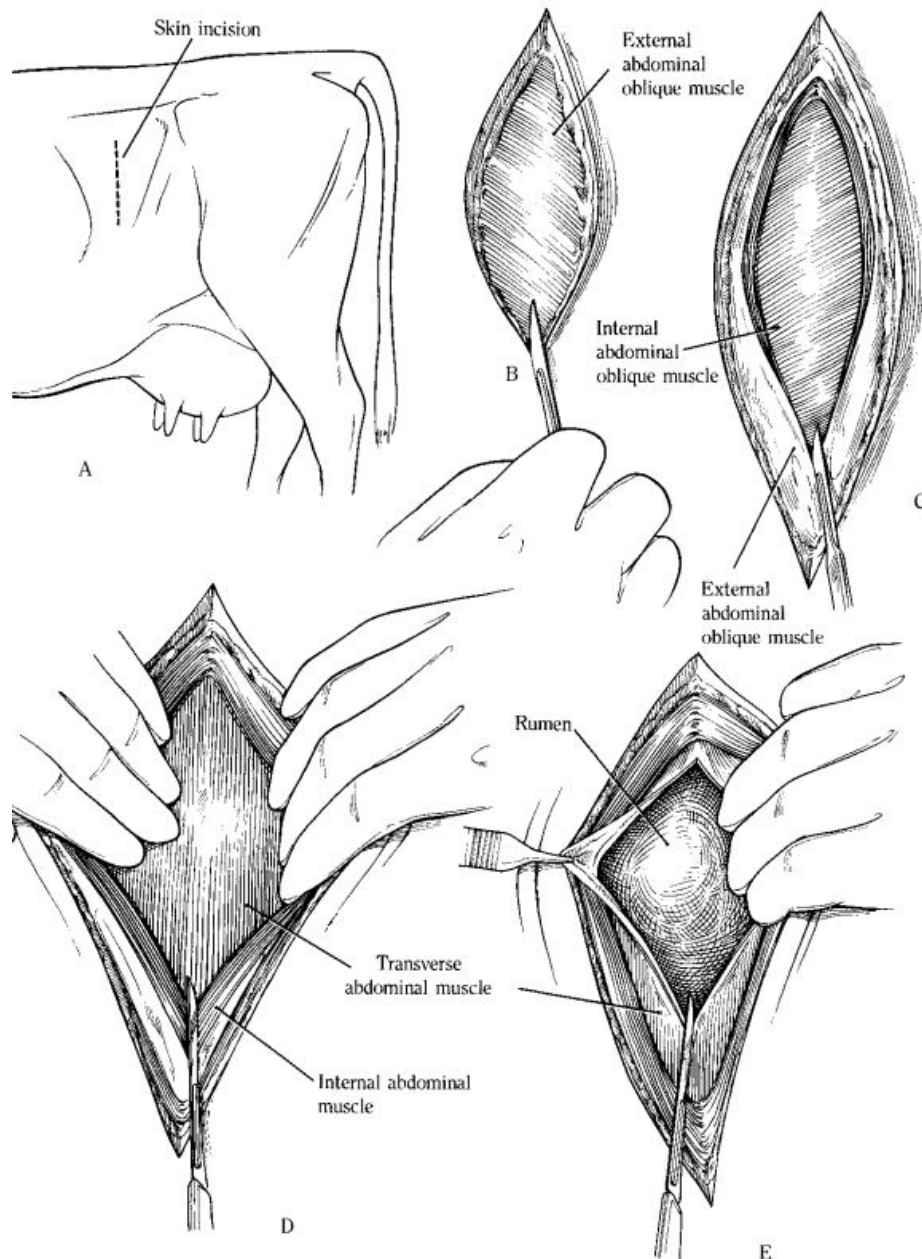


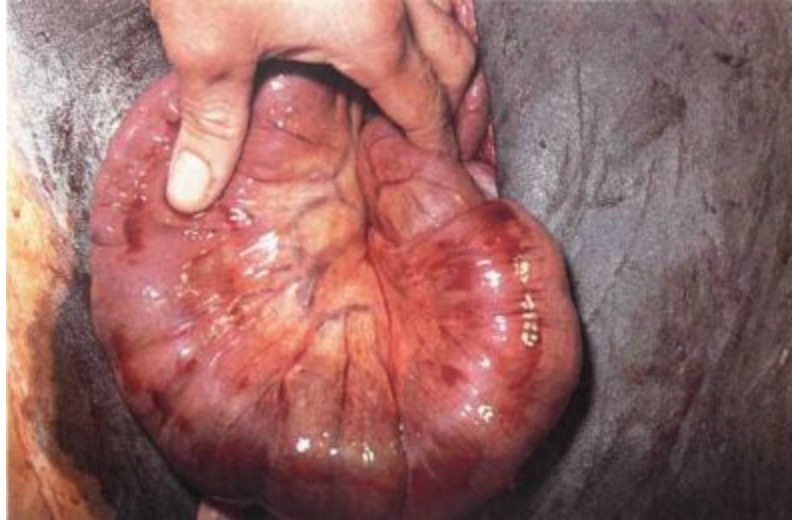
End-to-end intestinal anastomoses and resection surgical technique:

- The peritoneal cavity is opened via a right flank laparotomy approach (either standing or recumbent with GA depending on the client's worth of the animal and the ability of the surgeon to do the resection safely)
  - An incision is made vertically through the skin of the right paralumbar fossa about 20- 25 cm long or long enough to accommodate the intestines in this case
  - The muscles layers are then incised one layer at a time (first the external oblique abdominal, then the internal oblique abdominal and finally the transverse abdominal muscle)



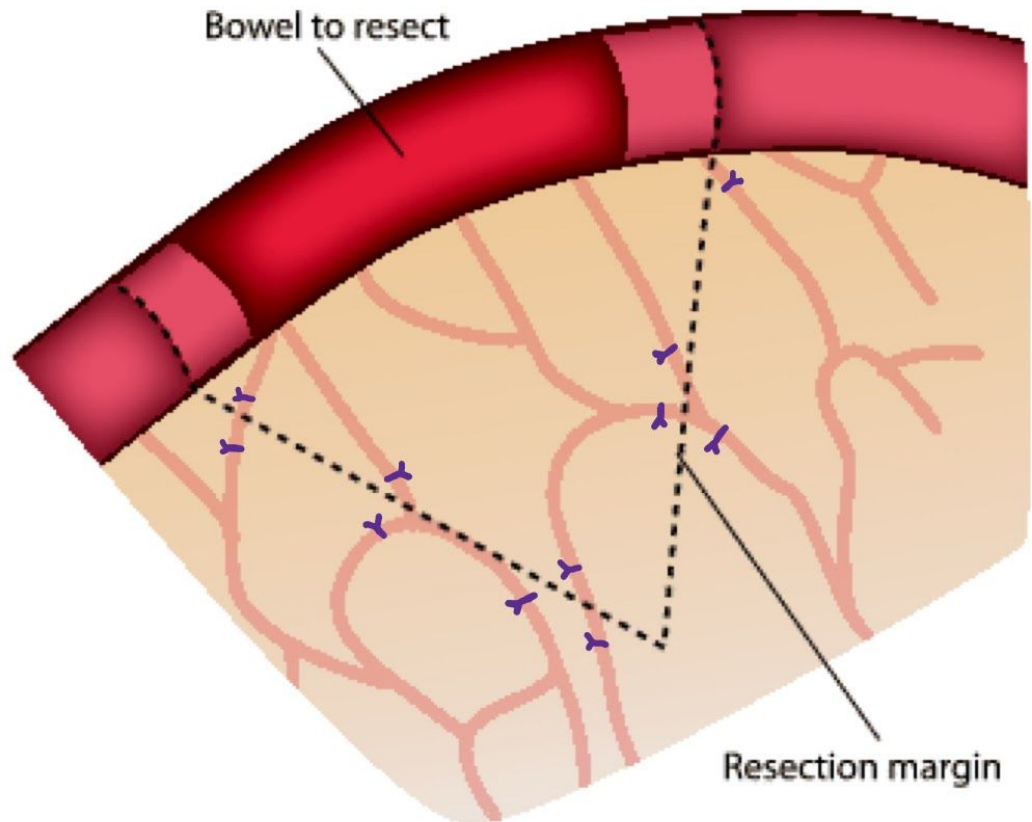
(Image describes Left flank approach but the initial technique is the same)

- The abdomen is searched thoroughly for the affected portion of the intestine (it would be distended) is gently exteriorized from the abdomen through the incision using laparotomy sponges
  - The lap sponges should be soaked in sterile saline so that they are not dry and tacky in order to facilitate gentle tissue handling



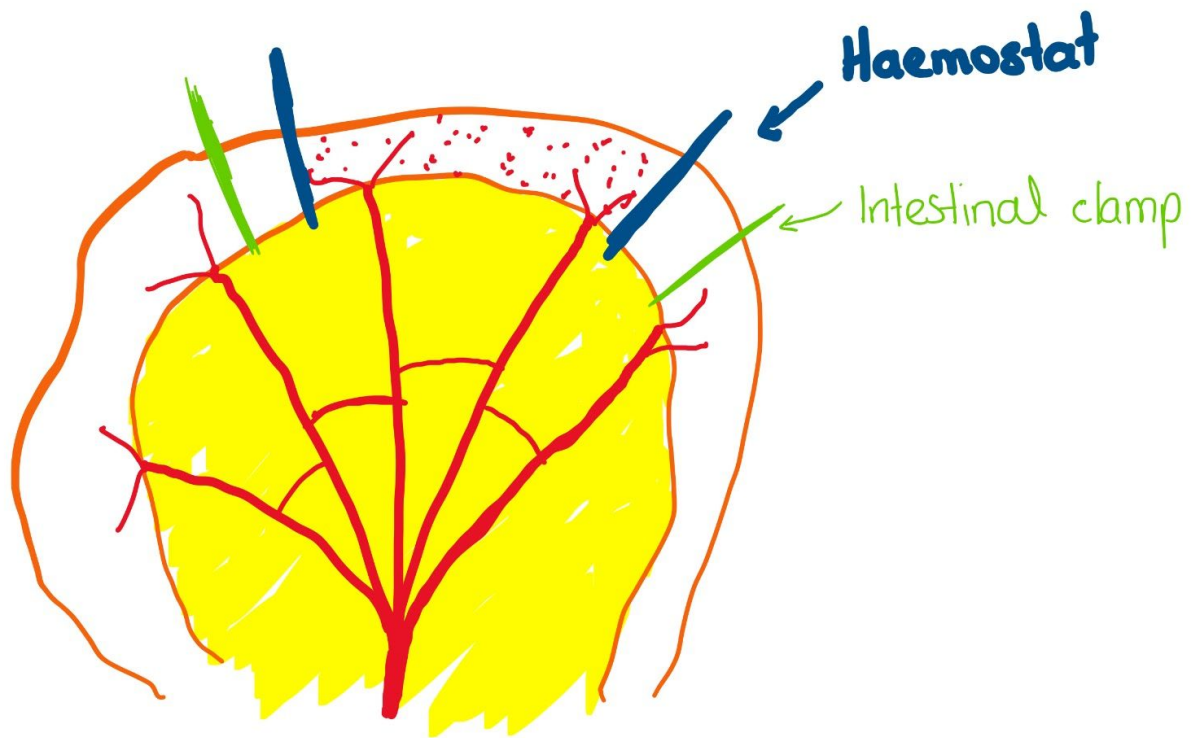
- If the affected portion of the intestine is in the jejunum or ileum, the greater omentum must first be reflected cranially to view these areas
- The affected portion of the intestine is carefully assessed
  - A decision on what vessels to ligate and at what angle to cut the intestine is made
- The blood vessels of the section of the intestine to be removed are ligated using 3-0 or 4-0 absorbable suture material with two surgeon's knots (proximally and distally) pulling tightly.

- The vessels are ligated both where they supply the intestine and where they would continue to supply other vessels so as to prevent haemorrhage.



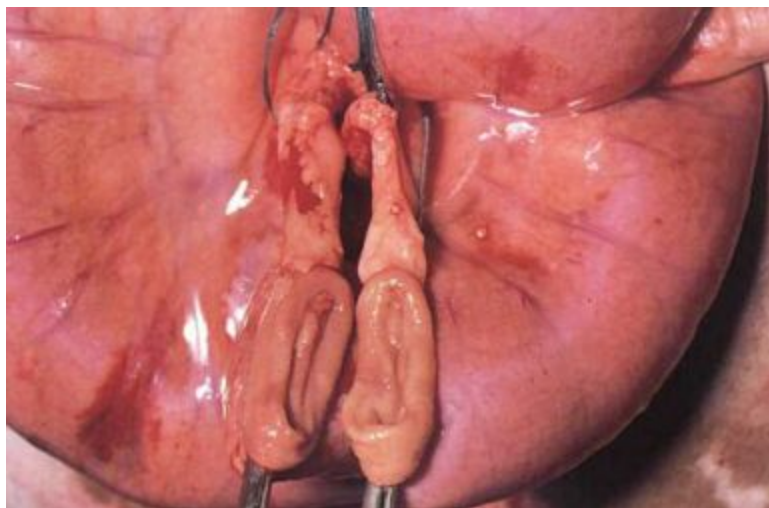
Y - represents the ligations that need to be made

- Haemostats are then placed on both sides of the diseased portion of the intestine (both the oral and ab-oral portions). Next the ingesta is milked away from the haemostats followed by placement of intestinal clamps proximal to the haemostat on the oral portion and distal to the haemostat on the ab-oral portion (finger clamps by an assistant can be used as a substitute)



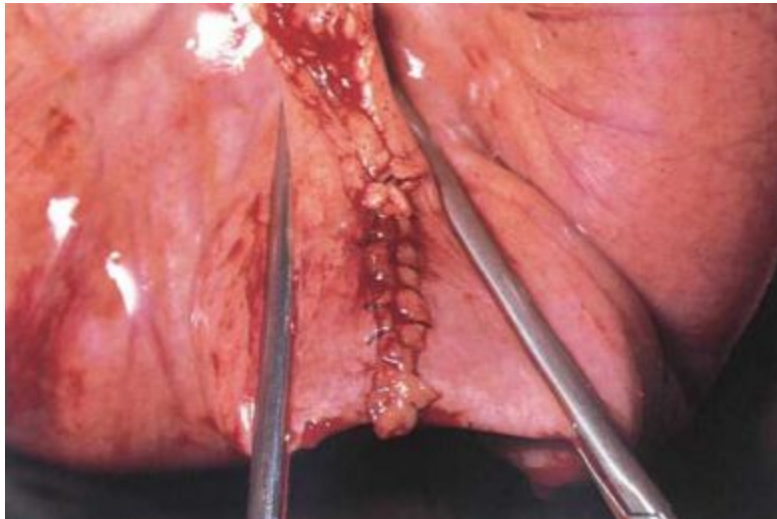
(Personal illustration of haemostat and intestinal clamp placement)

- The diseased portion of intestine and the vessels are then excised, allowing the blade of the scalpel to slide against the intestinal clamp as a guide (if a portion of the intestine is smaller than the other, an oblique cut is made to facilitate equal anastomoses)

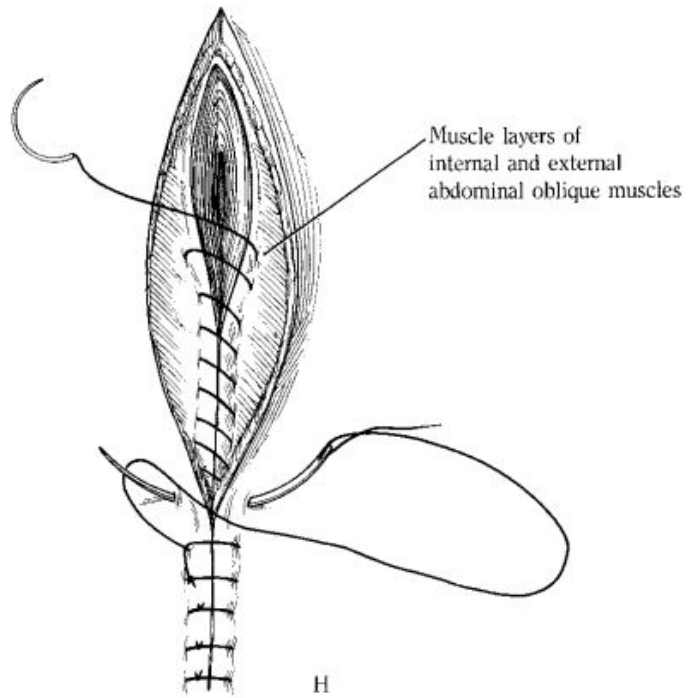
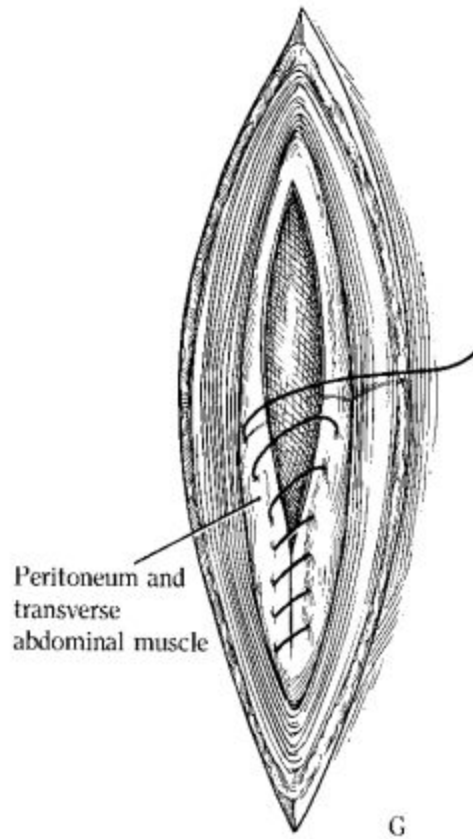


- The healthy intestine is anastomosed as follows:

- Place a simple interrupted suture at both the mesenteric and anti-mesenteric border of the intestine 3 mm away from the border of the incision
  - Ideally, the suture material should only penetrate up to the submucosal layer of the intestine
- Connect the two sutures by placing simple continuous sutures 3mm apart and 3 mm away from the order of the incision (the 3-3 rule) both on the 'near' and 'far' sides of the intestine



- Once sutured, the anastomosed site is flushed with sterile saline
  - Sterile saline can also be injected into the lumen to check for leaks which can then be fixed with simple interrupted sutures
- The mesentery is then sutured in a simple interrupted pattern
- A piece of omentum is then wrapped around and stitched (simple interrupted) to the anastomosed intestine
- The intestine can be flushed once more before placing back into the peritoneal cavity
- The incision is then closed by closing the transverse abdominal muscle and the peritoneum with a simple continuous suture pattern in a ventral-dorsal manner followed by the other two muscle layers (either separately or together) with a simple continuous suture pattern, anchoring it the underlying transverse abdominal muscle. Next the subcutaneous layer of the skin is sutured closed using a simple continuous suture pattern. Finally, the skin is sutured using a Ford-interlocking suture pattern.
  - Ideally each bite should be taken equidistant of each other for optimal closure
  - 0 or 1 metric synthetic absorbable monofilament is used to suture muscle and subcutaneous tissue while the skin is sutured with a non-absorbable material such as Nylon or Vetafil (suggested by the Techniques in Large Animal Surgery textbook, page 215).



#### References:

- Desrochers A, Anderson DE. Intestinal surgery. Veterinary Clinics: Food Animal Practice. 2016 Nov 1;32(3):645-71.
- Hendrickson DA, Baird AN. Turner and McIlwraith's techniques in large animal surgery. 4th ed. Hoboken, NJ: John Wiley & Sons; 2013.
- Kersjes AW, Németh F., Rutgers LJE. Atlas of large animal surgery. Baltimore: Williams & Wilkins; 1985.

#### Videos:

- Video demo on how to suture the intestine using synthetic tissue:
  - [https://www.youtube.com/watch?v=mJT\\_cUIQz4U](https://www.youtube.com/watch?v=mJT_cUIQz4U)
- Demo on a synthetic canine cadaver
  - <https://www.youtube.com/watch?v=ZzEdo43ZSxM>
  - Instead of ligating individual vessels they ligated large portions of the mesentery