

GASTROINTESTINAL SURGERIES:

LAPAROTOMY



BASICS

OVERVIEW

Laparotomy is defined as an incision through the flank or abdominal wall. Left and right paralumbar fossa laparotomies are commonly performed in ruminants for a multitude of indications. The right paramedian approach is also routinely performed for a few specific indications. Exploratory laparotomies are performed in the absence of a definitive diagnosis based on physical examination, clinical pathology, and imaging and lead to a diagnosis in 15-20% of cases.

SYSTEMS AFFECTED

- Gastrointestinal
- Genitourinary
- Hemolymphatic

SIGNALMENT

Potentially all ruminant species

INDICATIONS

Left Paralumbar Fossa Laparotomy

- Left displacement of the abomasum
- Rumenotomy
- Rumenostomy
- Splenectomy
- Caesarean section

Right Paralumbar Fossa Laparotomy

- Abdominal exploratory
- Caesarean section
- Cecal disorders
 - Impaction
 - Torsion/volvulus
- Intestinal disorders
 - Mesenteric torsion
 - Intussusception
 - Jejunal hemorrhage syndrome
- Left displacement of the abomasum

- Right displacement of the abomasum
- Invasive biopsy of the liver, kidneys, or intestine

Right Paramedian Laparotomy

- Left displacement of the abomasum
- Abomasal ulceration (perforating)
- Abomasal impaction

SURGICAL PROCEDURE

- These procedures are often performed using a local anesthetic or regional nerve block with or without sedation. Sedation, if used, should be used with care so as not to cause recumbency during the procedure. In small ruminants general anesthesia may be elected.
- Entry into the abdomen will be essentially the same for all paralumbar approaches. After surgical preparation of the area, a skin incision is made midway between the last rib and tuber coxae and approximately 2 to 3 inches (5 to 7.5 cm) below the lumbar transverse processes. After incision of the skin, the external abdominal oblique, internal abdominal oblique, transversus abdominis, and peritoneum are systematically incised to enter the peritoneal cavity.
- The contents of the peritoneal cavity should be systematically explored to assess normal/abnormal internal organs. A good grounding in basic abdominal anatomy is key to performing a thorough abdominal exploratory. The surgeon should have a grasp of the normal position, size, and texture of the internal organs.
- Many of the internal organs in the ruminant abdomen are contained within the greater omentum.
- Understanding the boundaries and extent of the omental structures will allow proper exploration of the abdomen.
- Structures that should be located and examined include: liver, gallbladder, diaphragm, right kidney, descending duodenum, greater omentum, left kidney, small intestines, cecum, colon, reproductive tract, urinary bladder, lymph nodes, rumen, reticulum, omasum, and abomasum.
- The reticulum and diaphragm should be palpated for adhesions.
- The liver should be examined for abscessation and adhesions.
- Kidneys and ureters should be examined for size, shape, and texture.
- The left side of the rumen should be palpated to rule out a left displaced abomasum.
- In an animal with colic, bloody stool, or intestinal distension, it may be necessary to run the bowel to check for a mesenteric torsion, intussusception, or blood clot (jejunal hemorrhage syndrome).
- Peritoneum, transversus abdominis, and internal abdominal oblique are closed with an absorbable monofilament suture material in a simple continuous pattern. External abdominal oblique is closed similarly. Skin is closed with a monofilament non-absorbable suture material in a Ford interlocking pattern.
- The right paramedian approach requires the animal to be sedated and rolled into dorsal recumbency on a soft surface with legs restrained. The area is surgically prepared and a skin incision is made approximately 2 to 3 inches (5 to 7.5 cm) caudal to the xyphoid process between the midline and right external abdominal vein. The rectus abdominis and peritoneum are then incised. The abomasum can be located along the ventrum and exteriorized in order to repair the LDA, abomasal perforations, or relieve abomasal impactions accordingly. The peritoneum, rectus abdominis, subcutaneous tissue, and skin are closed separately to minimize the risk of herniation.



MEDICATIONS

- Peri-operative antibiotics may be warranted to prevent post-operative wound infection and/or bacterial peritonitis or to treat concomitant infection, e.g. metritis in a cow with a left displaced abomasum.
- Antibiotics should be selected based on spectrum of activity, species of animal being treated, and the indication (e.g. surgical prophylaxis versus concomitant infection). There are currently no antibiotics labelled for surgical prophylaxis in the United States; hence any such use is considered extra-label drug use. All extra-label drug usage should follow the Animal Medicinal Drug Use Clarification Act (AMDUCA) or similar regulations put forward in other countries.
- The duration of antibiotic administration should be judged based on the post-operative condition of the patient and surgery site.
- Supportive medical care beyond antibiotics will depend on the reason for performing the laparotomy.
- Additional therapy may include intravenous fluids to correct acid/base and electrolyte imbalances and nonsteroidal anti-inflammatory drugs (NSAIDs).

PRECAUTIONS

- Appropriate milk and meat withdrawal times must be followed for all compounds administered to food-producing animals.
- Goats are extremely sensitive to the effects of lidocaine. Care should be taken with the use of this drug to avoid overdosage (dose should not exceed 5mg/kg).



FOLLOW-UP

The surgery site should be monitored for redness, heat, swelling, and drainage. Skin sutures should be removed in 10 to 14 days.

POSSIBLE COMPLICATIONS

The most likely complication is peritonitis secondary to inadequate aseptic technique. Infection or dehiscence of the incision site may also occur.

PROGNOSIS

Prognosis will depend on the reason for performing the laparotomy.



MISCELLANEOUS

PREGNANCY

- Right paramedian approach should be avoided in late gestation due to increased risk of complications in dorsal recumbency.
- See specific chapters on cesarean section for more information.

SEE ALSO

- Anesthesia: Injectable
- Anesthesia: Local and Regional
- Displaced Abomasum
- Cesarean Section: Bovine
- Cesarean Section: Camelid
- Cesarean Section: Small Ruminant
- Gastrointestinal Surgeries: Rumenotomy/Rumenostomy (www.fiveminutevet.com/ruminant)
- Hernia Surgery (www.fiveminutevet.com/ruminant)

ABBREVIATIONS

- AMDUCA = Animal Medicinal Drug Use Clarification Act
- NSAIDs = nonsteroidal anti-inflammatory drugs

Suggested Reading

Ames NK. Noordsy's Food Animal Surgery. 5th ed. Ames: John Wiley and Sons, 2014: 83-103.
Hendrickson, D.A., Baird, A.N. Turner and McIlwraith's Techniques in Large Animal Surgery. 4th ed. Ames: Wiley Blackwell, 2013:211-215.
Niehaus AJ. Surgical management of abomasal disease. Vet Clin: Food An Pract. Sept 2016. Online.

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