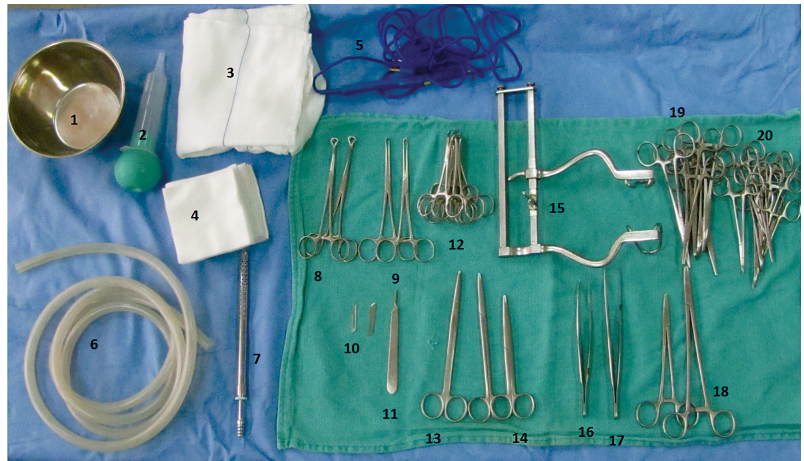


Exploratory Laparotomy in the Dog & Cat

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Exploratory laparotomy is routinely performed in small animal practice and is indicated when organ dysfunction or trauma involving the abdominal cavity requires definitive diagnosis along with surgical treatment and prognosis.¹ Surgical exploration provides information through inspection, palpation, and/or hollow organ luminal mucosa observation. Samples can be obtained for microbiologic and cytologic examination or biopsy for histopathologic examination. Abdominal exploration should be performed in a timely manner to increase the likelihood of successful diagnosis and management without negatively affecting the patient.

A ventral midline laparotomy of adequate length from xiphoid to the pubis is the standard approach to explore the entire abdominal cavity in a systematic manner. Every surgeon may develop his or her own technique, but a suggested method includes exploring the cranial quadrant (diaphragm; liver, gallbladder, and bili-

ary tree; spleen and stomach; duodenum and pancreas), caudal quadrant (jejunum, ileum, and colon; urinary bladder; urethra and prostate or uterus), right paravertebral region by retracting the mesoduodenum, and left paravertebral region by retracting the mesocolon (kidneys, adrenal glands, ureters, and ovaries).²

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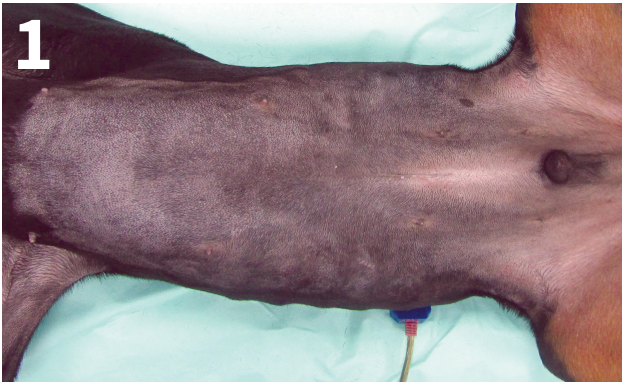
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WHAT YOU WILL NEED

- ▲ Necessary instrumentation for performing an exploratory laparotomy includes a well-equipped general surgery pack. Swabs and sponges should be counted at the beginning and the end of surgery.

STEP-BY-STEP EXPLORATORY LAPAROTOMY

STEP 1



Generously clip and prepare the surgical site, extending cranially to the xiphoid, caudally to the pubis, and over 5 to 10 cm from the ventral midline on either side. Express the bladder through the abdominal wall.

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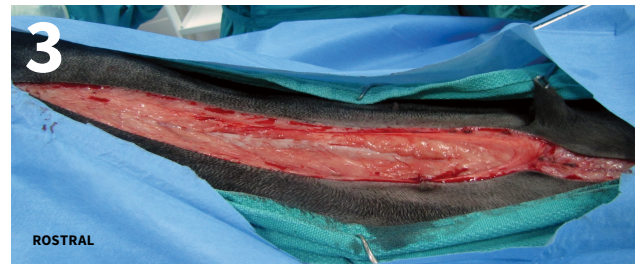
Midline laparotomy incision should extend from xiphoid to pubis.

STEP 2



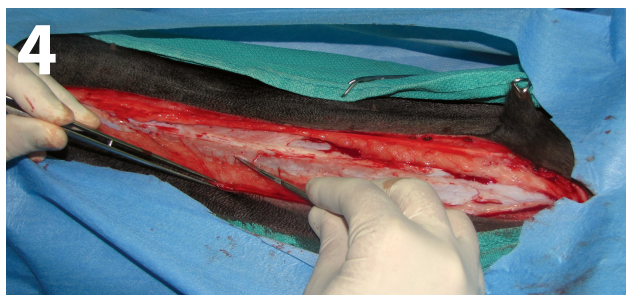
Inject preincisional block (2 mg/kg bupivacaine) along the ventral midline from the beginning to the end of the proposed incision in a fan-like fashion to infiltrate subcutaneous and muscular tissues. This technique provides postoperative analgesia for at least 24 hours.^{3,4}

STEP 3



Use a 4-corner draping technique: in male dogs, grasp the prepuce with towel forceps and position laterally to the midline to avoid urine spillage into the surgical site; penis and prepuce can be covered by 1 of the lateral drapes. Make a parapreputial skin incision, dividing the preputial muscles and sealing external pudendal vessels with electrocautery following the incision to allow reflection of the prepuce and penis laterally to visualize the linea alba. In female dogs and all cats, extend the ventral midline incision from xiphoid to pubis.

STEP 4



After skin incision, seal subcutaneous vessels via electrocautery and undermine subcutaneous tissues from attachment to the rectus sheath 1 cm laterally to visualize the linea alba. Avoid excessive undermining to prevent vascular compromise of the fascia and dead space creation and subsequent seroma formation.

STEP 5



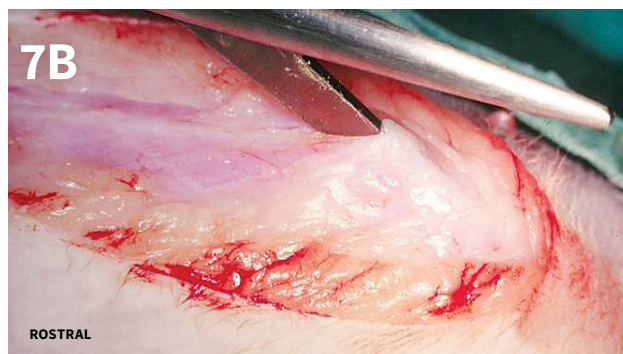
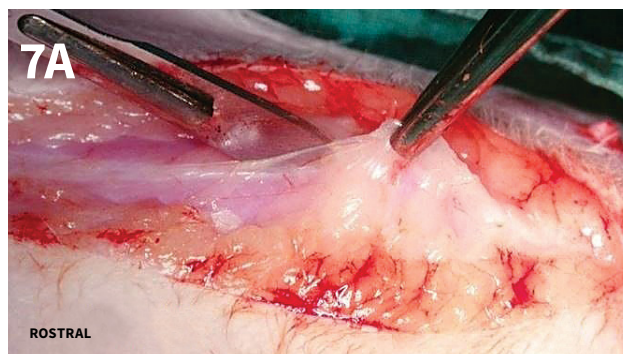
Make a stab incision to the linea alba with a scalpel and insert a finger into the incision to ensure entry to the abdominal cavity and to confirm that there are no adhesions between the abdominal wall and intra-abdominal organs. A stab incision and letting air into the abdominal cavity also allows the abdominal organs to “fall” dorsally, away from the ventral aspect of the abdominal wall, making the subsequent extension of the midline incision safer.

STEP 6



Insert thumb forceps with the tips placed caudally to lift upward on the linea alba and make a cranial to caudal incision. Extend the incision cranially by directing thumb forceps with tips placed cranially.

STEP 7



An alternative technique to enter the abdominal cavity is to lift the linea alba with thumb forceps and make a stab incision with the cutting edge of the scalpel blade pointing upward (A). Use Mayo scissors to extend the incision (B).

STEP 8



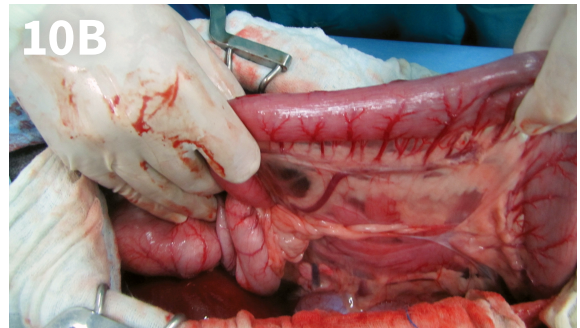
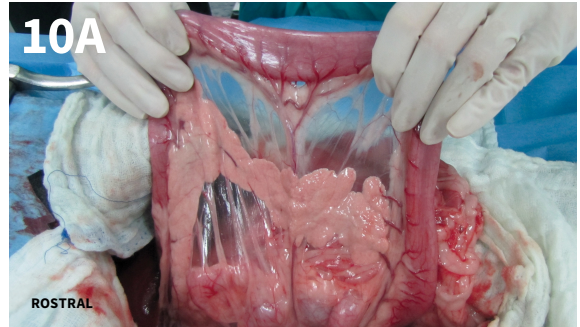
When treating dogs, excise the falciform ligament with electrocautery or by placing a ligature at its base to improve exposure to the cranial abdomen.

STEP 9



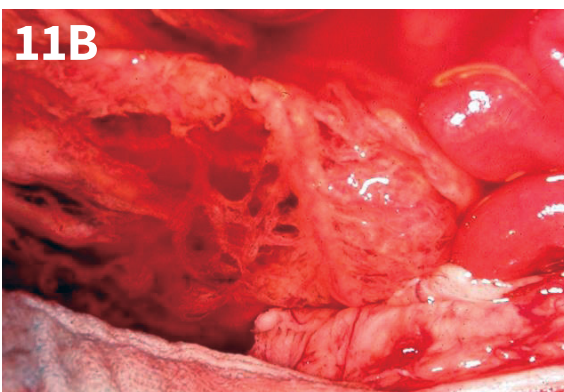
After the abdomen is entered, protect wound edges with moistened laparotomy pads and place Balfour retractors.

STEP 10



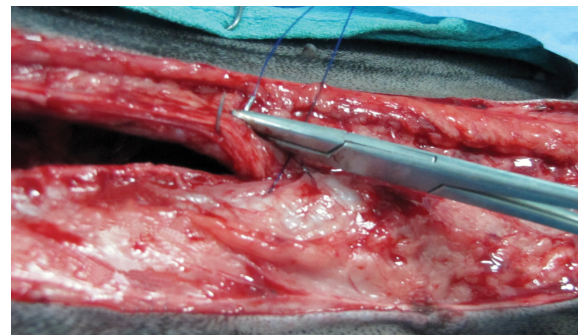
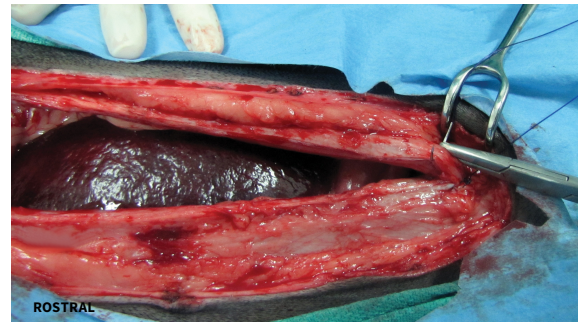
Use a systematic approach for abdominal exploration. Abdominal organs should be inspected by direct vision and palpation. Gently lift the right lobe of the duodenum and mesoduodenum toward the left side of the animal to allow exposure of the right kidney, adrenal gland, ovary, and ureter (A). Gently lift the colon and mesocolon toward the right side of the animal to expose abdominal organs of the left paravertebral fossa (B).

STEP 11



Following abdominal exploration, lavage the abdominal cavity using large volumes of warm normal saline solution, which aids in removal of contaminants and patient warming (A, B).^{2,5} Completely remove lavage fluid by suction before closing the abdomen to avoid compromise of defense mechanisms.²

STEP 12

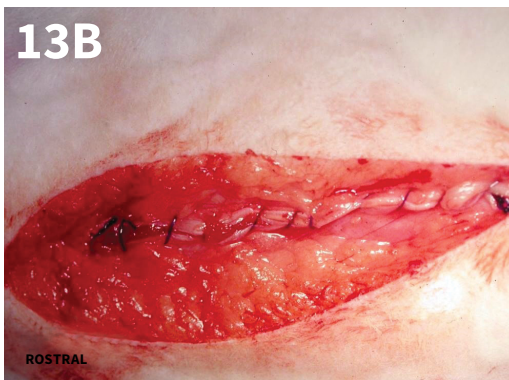


The midline laparotomy incision is closed in 3 layers. The abdominal wall is closed using the external leaf of the rectus abdominis muscle sheath in a simple continuous or simple interrupted suture pattern. Most surgeons favor a continuous polydioxanone or polyglyconate suture pattern, which provides a quick and secure closure. Sutures should be placed 5–10 mm from the incision edge and spaced 5–10 mm apart, depending on the size of the animal (A).^{6,7} Suture size depends on the animal's weight (animals <5 kg: 3/0; 5–20 kg: 2/0; 20–40 kg: 0; and >45 kg: 1)(B).

Author Insight:

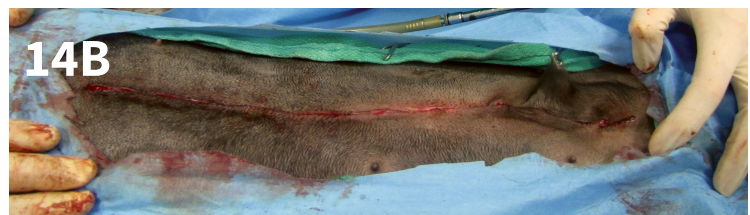
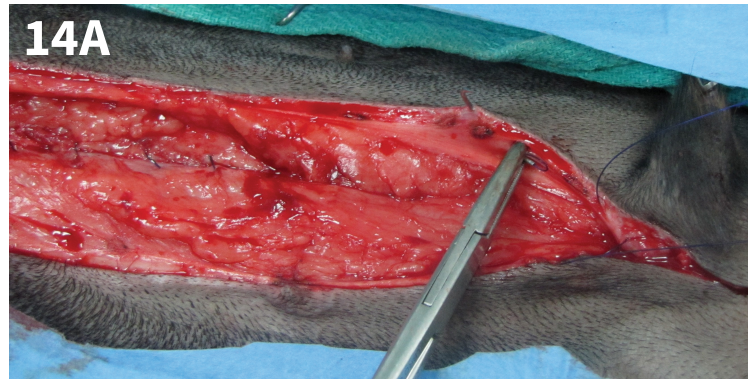
Closure of the linea alba must include the external leaf of the rectus sheath.

STEP 13



Place 6 throws at the beginning and 7 at the end of the continuous pattern (A).^{8,9} Sutures should be placed tightly enough, depending on the suture material used, to get the incision edges into apposition (B).

STEP 14



For the second layer, subcutaneous closure is most commonly accomplished in a simple continuous pattern using 3/0 synthetic absorbable monofilament suture to eliminate dead space and decrease tension in the incision, allowing skin edges to be placed in close apposition (A). Bury knots in the beginning and end of the suture pattern (B). In male dogs, preputial muscle should be apposed separately with a couple of simple interrupted sutures to reposition the penis normally.

Author Insight:

Sutures should not be placed too tightly as this can cause ischemic necrosis of the incision edges; however, they must be tight enough to achieve adequate apposition of the incision edges.

STEP 15



Close skin using a simple continuous (A), Ford interlocking (B), or intradermal pattern with buried knots (C), or use staples (D).

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