

RIGHT PARALUMBAR LAPAROTOMY/CELIOTOMY IN REBECCA

1. The anaesthesia team continued to determine the respiration and heart rate using stethoscope every 5 minutes (to ensure that they remain within normal range) with continuous monitoring of arousal signs throughout the surgery.
 - Signs of arousal/'waking up' from sedation include kicking, and grunting/moaning.
 - They adjusted the drip rate and gave additional intermittent quantities of the 1/4 volumes of the loading dose of xylazine and ketamine as they deemed necessary.
 - Additionally, Splash dose of Lidocaine was administered intermittently throughout the surgery directly onto the surgical site as recommended by the anaesthesia team. This was 4 ml per splash.
2. Make a straight-line incision through the skin.
 - Cut midline between the last costal arch and point of the hooks (tuber coxae). Start 3 cm from the transverse process of the lumbar vertebrae just until the curve of the ventrum.
 - Ensure that the length of this initial incision is long enough to allow easy visualization and access to the internal organs.
 - Ensure to use the belly of the scalpel blade. Start cutting the skin with gradual increases in pressure with one stroke until the skin tissue separates under the blade and white connective tissue is seen immediately under. At this point maintain that pressure while making a singular long stroke. Care should be taken to avoid cutting too deeply into the tissues below the initial incision as blunt dissection of each muscle layer.
3. Blood vessels that cross the surgical can be ligated with absorbable suture before cutting through them or clamped with a haemostat once bleeding occurs. This was done throughout the procedure.
4. The cutaneous trunci lie under the skin and is a more substantial tissue in sheep compared to cattle.
 - Each abdominal muscle layer was picked up with forceps, nicked with a scalpel blade then bluntly dissected with a scissors.
 - Insert the scissors under the muscle and open the tip of the scissors angled upwards to avoid nicking structures and to expand the area creating a tunnel.
 - Using the forceps to then lift the muscle layer the scissors was used to cut through the length of muscle tissue.
5. The external abdominal oblique muscle was visualized with caudoventral running muscle fibres. The more ventral aspect of this muscle layer consists of the aponeurosis seen as a thinner, white, shiny sheet. This muscle was cut with the undermined then cut using the forceps and scissors in step 4.
6. The internal abdominal oblique muscle was visualized with cranioventral running muscle fibres. This muscle layer consists of the very prominent aponeurotic sheet. This muscle was cut with the undermined then cut using the forceps and scissors in step 4.
7. The transverse abdominal muscle was then visualized with transverse running muscle fibres, or fibres that run parallel to the ribs.
 - This was carefully treated to avoid puncture of the intestine/abdominal organs that lay immediately below, such an action leads to peritonitis.
 - The transverse abdominal muscle was pick upwards with forceps, (laterally away from the abdominal cavity), nicked with a scalpel blade to create a hold wide enough for a finger to be inserted.
 - Inserting a finger through this nick then passing it around the peritoneum allows to dislodge any inadvertent adhesions to the peritoneum.
 - Carefully with the forceps the transverse muscle and peritoneum were lifted away from the abdominal cavity then they were cut with the scissors.

8. Generally, each organ was examined utilizing palpation and visually assessing colour, pattern of blood supply and peristaltic wave.
9. The omentum was visualized as a white, fatty, netted sheet covering the abdominal structures. This covered rumen seen medially to the omentum. This was palpated gently to feel gas and ruminal contents.
10. Splash block of lidocaine was administered of 4 ml, on the internal organs especially on the small intestines to prevent post-operative ileus.
11. Cranially and ventrally the abomasum was visualized by gently pulling it out of the abdominal cavity.
 - The abomasum was connected to the pylorus and the thick fatty piece of greater omentum called "sow's ears."
 - Sow's ear is an important structure used in omentopexy to prevent the occurrence of displaced abomasum or abomasal torsion in cattle. The abomasum is prone to torsion or displacement, which is the most common cause of hearing pings on the left side of the abdomen.
 - These organs that were moved from the abdominal cavity was placed on a sterile surface and regularly moisten with sterile saline and splash block.
12. Each organ that was pulled out of the abdominal cavity was carefully replaced to ensure it enters maintaining accurate anatomical location and using the palm of the hands, avoiding using the tips of fingers to prevent puncturing of tissues.
13. Cranially moving further dorsally the following structures were palpated in situ, including the liver, gall bladder, reticulum, and diaphragm.
 - The liver was smooth, lobulated, with sharp edges and the gall bladder was a small fluid filled sac.
 - The reticulum was dense ball structure and is the most cranial abdominal structure with the spleen on the left. Care should be taken when palpating this especially in older ruminants as sharp metallic objects tend to get lodged in and through the reticulum if ingested.
 - The diaphragm was taut smooth and with the palm pressed against it, the heart beat could be felt.
14. Caudally the cecum was visualized by placing it outside of the abdominal cavity.
 - It was large blind ending sac. The caecum is prone to ceacal torsion, which is the most common cause of hearing pings on the right side of the abdomen.
 - The caecum was connected to the ileum, noted but its longitudinal blood supply and less tortuous composition.
 - The cecum, ileum and colon were noted to join at the Ileocecolic junction. The Ileocecolic junction is prone to intorsion.
15. Ventrally to the caecum is the small intestine. This includes the ileum, jejunum and duodenum. The jejunum and duodenum are very tortuous narrow tubes. These are thus prone to obstruction.
16. Flipping the caecum to the opposite side reveals the neatly organized spiral colon. Ventral to this the tortuous small intestine was observed.
17. These structures were carefully re-inserted into abdominal cavity as above while giving another splash block.
18. Caudal to the incision the following structures were palpated in situ, including the bladder, uterus, pelvic brim and rectum.
 - The bladder was palpated but it was flaccid indicating that Rebecca urinated prior to surgery.
 - The uterus was small firm coiled structure with long twisting uterine horns.
 - The rectum was a most dorsally along the pelvic brim large, tubular structure with some pelleted shaped feces.
 - The inner pelvis was felt as a smooth curved boney structure and the ventral aspect of the sacrum was also felt.

19. Within the retroperitoneal space, dorsal to the incision, covered in retroperitoneal fat was the kidney. It was firm oval shaped with a clear capsule.
20. The peritoneum and transverse abdominis was sutured together with a simple continuous pattern using absorbable 1.0 Polyglactin 910 or Vicryl.
21. The internal and external abdominal oblique muscles were sutured together with a simple continuous pattern using absorbable 1.0 Polyglactin 910 or Vicryl.
 - An addition was made to the suturing to remove or decrease dead space, this was achieved by suturing the internal and external abdominal oblique muscles to the peritoneum and transverse abdominis muscle after every three loops or bites.
 - Large bites around 7 mm were taken from the incision line to decrease the chance of the suture tearing through the tissue.
 - Bites were made in an attempt to grasp fascia, connective tissue and muscle all in one, to decrease the chance of tearing as fascia has greater holding capacity for sutures.
 - Using forceps or Army navy retractor to pull up the abdominal muscles with another surgeon pressing down the abdominal contents while performing the simple continuous suture, prevents the unwanted perforation of any abdominal organs with needle which can lead to septic peritonitis.
 - These muscle tissues were splashed with lidocaine before suturing.
22. Suture the skin with non-absorbable 2.0 Nylon (Supramid) in a Ford interlocking pattern.
 - This pattern was made until 5 cm from the ventral end of the incision line, here only simple interrupted sutures were placed until the end of incision. This allows for the preservation of length of ford interlocking sutures. Should drainage of fluids becomes imperative only the last few (most ventral) simple interrupted sutures needs to be cut.
 - It was noted to take bites 0.4 cm away from the skin edge. This reduces the chance of the suture ripping through the skin.
 - Simple interrupted sutured were placed where needed to ensure that none of the skin dermis was everted. This reduces the chance of infection into the body.
23. As the surgery was about to end the anaesthesia team decreased the drip rate allowing for a gradual awakening of the calf after surgery.
24. Rebecca was noted to be chewing on the endotracheal tube, so the cuff was deflated using negative pressure from a syringe and then endotracheal tube was removed.
25. The surgical site was cleaned with diluted chlorhexidine and gauze to remove the blood. Iodine was also swabbed around the surgical site.
26. The wound was then sprayed with Antibiotic spray (Tetravet) followed by Aluminium powder barrier (Alu spray) and then a Larvicide (Metabicheras fort dodge) was sprayed around the wound.
27. Rebecca was increasingly active at the end of surgery and once placed into the pen she periodically stood up and rested in sternal recumbency. These were good signs that she was coming out of anaesthesia.
28. The skin sutures are to be removed in 10-14 days, until then daily monitoring is recommended.

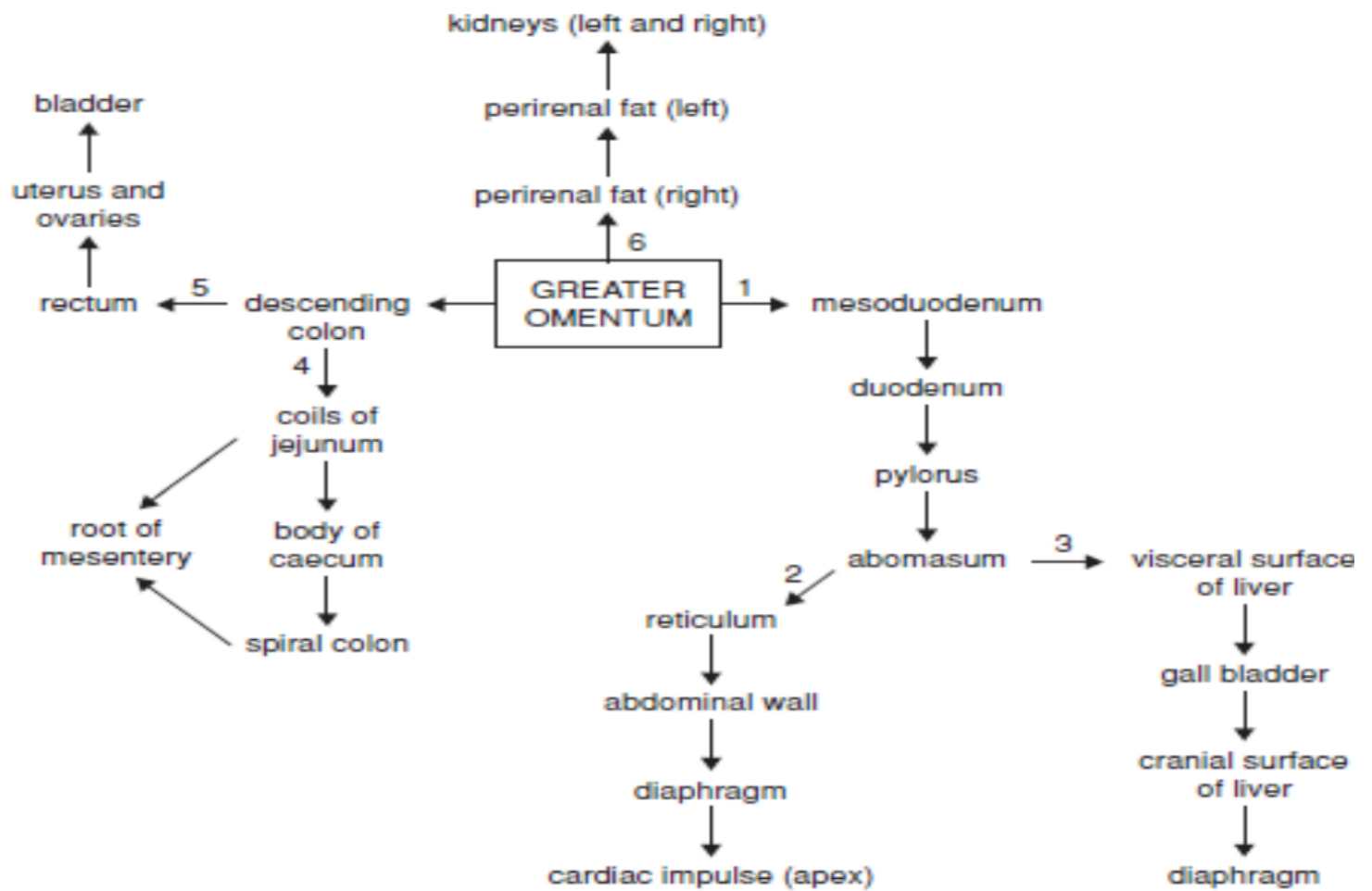


Figure 3.8 Flow diagram of right flank exploratory laparotomy. Entire accessible abdominal cavity should be checked in any case of suspected abdominal disease.

