

### Step By Step LDA Repair Using the Grymer / Sterner Toggle Suture Method

#### **Step By Step Repair of LDA**

Toggle repair of the LDA can be accomplished with or without tranquilization/sedation, depending on the disposition and size of the cow. Other considerations include the amount of help available and the type of facilities.

A minimum of 2 persons is recommended ( veterinarian and assistant ), however, 3 persons greatly facilitates the ease with which this procedure can be performed, particularly if the cow is large. It is best to perform this procedure in a pen of adequate size that allows for easy casting and complete roll-over of the cow.

- 1.** The cow is cast on her right side (as viewed from the rear), and placed on her back. It is very helpful to do this on a deeply bedded surface or on a soft earth surface, since it is much more difficult to keep her in this position on a hard surface.
- 2.** Depending on the comfort level of the surgeon and the amount of help available, the front and rear legs may be tied to an immovable object.
- 3.** The operational site is identified about 4-7 inches (10-15cm) behind the end of the xiphoid (breastbone) and prepared according to the preference of the surgeon. (Cleaned, clipped, scrubbed, sanitized, etc.) At the surgeon's discretion, the abomasum may be auscultated in this area with a stethoscope. When auscultating, the cow should be positioned with the loudest 'ping' in the center of the operational site previously described.  
It should be remembered that the abomasum will assume its normal anatomical position under most circumstances, except when concurrent adhesions or peritonitis might prevent normal movement to its correct anatomical location. Such cases are few, but occasionally cause failure to toggle the abomasum. This condition might merit a laparotomy for further evaluation.
- 4.** Have an assistant place the pressure of a knee, hand, or foot, on the lower left abdominal quadrant ahead of the udder, or in lieu of an assistant, the surgeon may elect to place a knee or foot on the abdomen from the cow's right side. This will help to ensure that the abomasum is in proper position and as close to the ventral abdominal wall possible.
- 5.** The trocar-cannula, with the push rod inside, is placed 4-7 inches (10-15cm) behind the end of the xiphoid (breastbone), and 2-3 inches (5-7cm) to the right of the midline.

Perforate the abdominal wall and the abomasum with a swift downward push of the trocar. **BE CAREFUL TO AVOID THE LARGE SUBCUTANEOUS ABDOMINAL VEINS IN THIS AREA!**

Pre-marking with a colored marking stick helps to locate the veins. However, should a vein be accidentally perforated, a simple interrupted suture can be placed at the site to minimize any bleeding.) The handle is removed from the cannula, and the push rod is run through the center of it to remove any skin plug, which often is present.

**6.** The distinct odor of abomasal gas may be identified at this time, and if desired, a small amount of fluid can be extracted via small diameter plastic tubing and checked for low pH (2-4).

**7.** After removing the plastic handle and push rod from the trocar needle, place the first toggle suture into the open lumen of the needle.

Use the push rod to move the toggle COMPLETELY through the length of the needle so that it will turn perpendicular to the long axis of the needle once in the abomasal lumen.

Tug lightly on the suture to ensure the toggle is clear of the trocar/cannula needle.

Remove the cannula and pull snugly on the suture, so that it lies firmly against the abdominal wall. Clamp the suture with the needle holder.

**8.** Place the second toggle 2-3 inches (4-7cm) anterior to the first toggle suture, forward toward the xiphoid (breastbone), in exactly the same manner described for the first suture. (Step 5, 6, and 7)

**9.** Before removing the trocar needle from the second suture site, place pressure on the external abdominal wall to force as much free gas from the abomasum as possible. This will reduce the tension on the sutures and help to reduce the chance of tearing the abomasal wall or leaking abomasal contents into the peritoneal cavity.

**10.** The two toggle suture ends are then tied together, using a number of square knots to suit the surgeon's preference.

It is suggested that a vertical distance of 3-4 inches (8-10cm) be left between the abdominal wall and the knots.

It is our clinical impression that cows respond better when the procedure is carried out this way, reducing the likelihood of fistula formation and pressure necrosis at the perforation site. Post operative medications are often easiest to administer at this point in the procedure.

**11.** The cow is then rolled clockwise and then to normal sternal recumbency. Remove the restraint ropes. If tranquilization/sedation has been used during the procedure, it may be reversed at this time. Allow the cow to rise if circumstances warrant.

**12.** Follow up care and treatment is at the discretion of the surgeon, and may include antibiotics and appropriate supportive therapy for other concurrent medical conditions (ketosis, metritis, dehydration, etc.)

\*When possible and practical, pre-operative beta-lactam antibiotics (penicillin, amoxicillin, ampicillin, ceftiofur) are indicated to help reduce the chance of clostridial intoxication. It is highly recommended that all candidates for this method of repair have recent and routine vaccinations for clostridial disease, as this is an occasional (but if contracted, always fatal) sequela to the LDA toggle suture repair method.