

Clinic's decade of LDA endoscopic repositioning techniques in cows

SINCE the introduction of laparoscopic-assisted repositioning of the left-displaced abomasum (LDA) (Janowitz, 1998), this technique has become the most commonly used procedure for the correction of this disorder in dairy cows at the Clinic for Ruminants at Justus Liebig University Giessen.

Besides this minimally inva-

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describes left abomasal displacement therapy in cows, and how a standard procedure has proved successful at a German clinic for ruminants

sive method, the left or right-flank omentopexy (Utrecht or Dirksen method) are still used in pregnant cows or in patients

suffering from a thrombophlebitis of the upper veins.

Endoscopic repositioning and fixation of LDA with the two-step Janowitz method has been modified into a one-step method by Christiansen (2004) and Barisani (2004).

Since 2000, this technique has been shown besides the classical Janowitz operation at the International Workshop on Laparoscopic Diagnostics and Therapy in Cattle, which takes place each year at the Clinic for Ruminants, Justus Liebig University Giessen (presented by the company Dr Fritz Endoscopy, Tuttlingen, Germany).

Materials and methods

In the past 11 years, approximately 2,450 cows with LDA were presented to the Clinic for Ruminants for diagnostics and therapy. In this time, 421 were treated by the Dirksen method and 1,958 according to the Janowitz method.

Seeger et al (2006) showed a comparison of results obtained by the use of laparoscopy-assisted abomasopexy versus omentopexy via right-flank laparotomy for the treatment of dairy cows with LDA. They showed success rates for both methods were almost equal.

The laparoscopic operation in the 1,958 cows was performed as described by Janowitz (1998). After a detailed clinical examination, patients are positioned on a 180°, hydraulic, tiltable surgery table and prepared for laparoscopic surgery (Figure 1).

Two small areas are clipped and aseptically prepared for laparoscopy. Position one is situated in the left paralumbar fossa 3cm to 4cm caudally of the last rib and about 7cm to 10cm ventrally to the processi transversi of the lumbar vertebrae. Position two is located about 10cm ventrally to the processi transversi in the 11th costal space (Figure 2).

Local anaesthesia is performed by infiltration of 20ml procain two per cent. Sedation is only necessary in very nervous patients. Two small incisions are made at positions one and two for the insertion of optics and the toggle setting trocar.

The first step, however, is the application of a pneumoperitoneum. This can be achieved actively by inserting a Verres needle connected to an insufflation pump into the abdomen; or passively by allowing air streaming into the abdomen

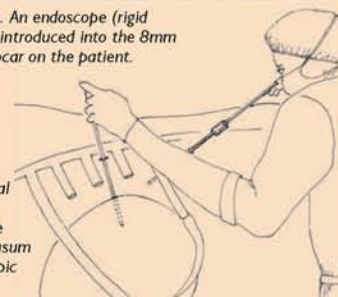


Figure 3. Insufflation of air via a Verres needle or through a 5mm magnetic valve trocar.



Figure 4 (above). An endoscope (rigid zero degrees) is introduced into the 8mm magnet valve trocar on the patient.

Figure 5 (right). Laparoscopic abomasopexy. Insertion of the trocar into the most dorsocranial aspect (greater curvature) of the displaced abomasum under laparoscopic guidance.



through a 5mm trocar placed into the abdominal wall (Figure 3). The Verres needle, or the 5mm trocar, is then substituted through an 8mm trocar for the optics (Figure 4). The LDA can now be seen as a dome between the left abdominal wall and the rumen on the right side. Cranially, the spleen and the

diaphragm can be seen. Under visual control, the toggle setting trocar can now be positioned and placed into the abomasum on top of the great curvature (Figure 5).

Through this trocar, deflation of the abomasum and application of a modified toggle

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Figure 1 (above). The patient is prepared for endoscopic surgery in a 180° hydraulic tiltable surgery table.
Figure 2 (inset). Trocar positions one and two indicated for endoscopic entry points.

INVITATION TO THE 2012 PRACTICAL WORKSHOP

Friday May 11, 2012 - Pierce Veterinary Clinic Ellsworth, WI

Bovine Laparoscopic Repositioning of the Displaced Abomasum for Field Practice



Instructors:

Dr. Steve Foulke, Lititz, PA
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pin into the abomasum is performed. After complete deflation of the abomasum, suture material connected to the toggle pin is inserted into the abdominal cavity and part two of the operation is prepared.

The patient is fixed to the tiltable table with two belts and brought into dorsal recumbency. Front and hind legs are tied to the table using adjustable foot supports and nylon bands around the metacarpus and metatarsus.

On the ventral abdominal wall, two more small areas are prepared aseptically for surgery. Position three is located 5cm to 10cm left from the midline and cranially from the umbilicus. This position is for insertion of the laparoscope, whereas position four is situated 5cm right from the midline and 10cm cranial from the umbilicus and is for fixation of the abomasum.

At position three, an 8mm magnetic valve trocar is inserted into the abdominal cavity and the rigid laparoscope is set into place. Now the suture material of the toggle pin is visualised. A second trocar (5mm magnetic valve trocar) is installed at position four and serves as an instrumental port for 35cm forceps. The suture material of the toggle pin is grasped via these forceps and exteriorised from the abdominal cavity (Figures 6 and 7).

After removing the trocars, and having pushed excess

air out of the abdomen, the patient is brought back into right-lateral recumbency. Fixation of the abomasum is achieved by gentle tension to the sutures and knotting them to a gauze bandage at a distance of 5cm from the abomasal wall to the bandage (Figure 8).

The 5cm points are marked on to the sutures of the security toggles in black. Insertion sights of the trocars are covered with aluminium spray and the patient is brought into an upright position.

The gauze bandage is left in place for three to four weeks before removal by the owner. According to the original description of this

method, antibiotics or analgesics are not necessary after routine surgery.

Results

From 2000 to 2011, 2,412 cows were surgically treated for abomasal displacement. Of those patients 1,958 underwent an endoscopic-assisted fixation of the abomasum (Janowitz method); therefore, 81.2 per cent of all surgical interventions concerning abomasal displacement were performed endoscopically.

From 2000 to 2002, a clinical trial was performed to determine the success rates between the Janowitz and Dirksen methods. From 2004 to 2007, two other clinical trials were performed using the Dirksen method. The endoscopic surgery percentages are shown in Table 1.

TABLE 1. Cases of surgically treated cows for abomasal displacement between 2000 and 2011

Surgery method	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Dirksen	86	86	31	28	42	64	33	20	3	9	6	13
Janowitz	107	158	224	204	154	101	145	187	171	179	172	156
Other		13				6	14					
Total	193	257	255	232	196	171	192	207	174	188	178	169
Laparoscopy (per cent)	55.4	61.5	87.8	87.9	78.6	59.1	75.5	90.3	98.3	95.2	96.6	92.3

Discussion

The formerly used standard operation technique for LDAs in cattle at the Justus Liebig University Giessen was the Dirksen method or right-flank omentopexy. After the introduction of endoscopically assisted abomasopexy in 1998 (Janowitz, 1998), this technique and the Dirksen method were used equally.

However, since 2007, the Janowitz method has mainly been used for the correction of a displaced abomasum. One reason for the quite long warm-up period at Justus Liebig University Giessen may have been because several clinical trials using the Dirksen method were performed between 2004 and 2007 at the Clinic for Ruminants. After the completion of these studies, more than 90 per cent of all left-displaced abomasums underwent laparoscopic abomasopexy.

As shown by Seeger et al. (2006) laparoscopy has some essential advantages compared to the Dirksen method.

- Advantages include:
- significantly shorter duration of the surgical procedure;
 - visual control of the abdominal cavity; and
 - the ability to perform the operation ambulant.

The ambulant procedure, especially, accounts for an overwhelming compliance with owners. One criticism of the Janowitz method is that the cow has to be brought into

dorsal recumbency. Therefore, patients with dyspnoea, extreme udder oedema or those in late pregnancy should not be treated this way.

However, the tiltable surgery table is not essential. Instead of using the table, patients may be sedated after the first step of the operation, tied down and then brought into dorsal recumbency using a front loader or simply two fixation rings screwed into a wall of the stable.

The modified Janowitz method, or one-step technique (Christiansen; Barisani), was developed to perform endoscopic abomasopexy in the standing patient. In some practices, this technique seems to be the predominantly used method in the field (Leeuwen et al. 2009).

Nevertheless, the two-step technique is preferred in the Clinic for Ruminants because the owners often ask for concomitant claw trimming and also because a visual control of the abdominal cavity in total can give further information about the clinical status of the patient.

Adhesions between the abomasum and the rumen or the abdominal wall, for example, can often only be seen in dorsal recumbency. Alterations of the liver in colour or shape can be seen and the fixation site of the abomasum can be checked before surgery is completed.

Problems in performing the



Figure 8. Fixation of abomasum with gauze bandage.

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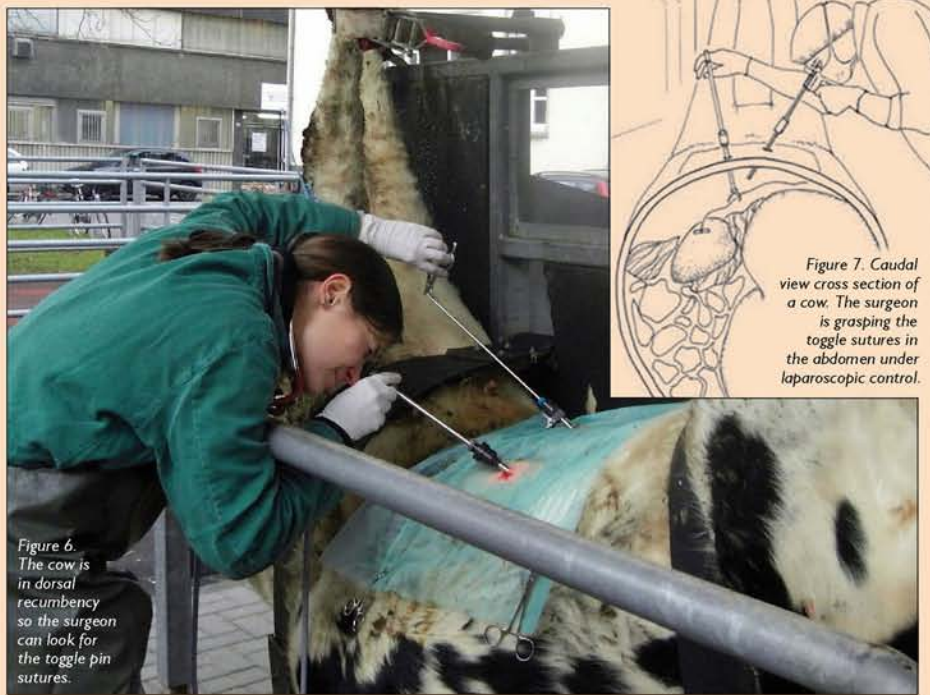


Figure 7. Caudal view cross section of a cow. The surgeon is grasping the toggle sutures in the abdomen under laparoscopic control.

Figure 6. The cow is in dorsal recumbency so the surgeon can look for the toggle pin sutures.

Conclusions

Janowitz method are regularly seen in patients suffering from adhesions between the abomasum and the left abdominal wall. In these cases, the abomasum is caught at the left side, mainly due to abomasal ulcers that lead to a local peritonitis and inhibit a successful therapy.

Another common complication is that the suture material of the toggle pin cannot be found when the cow has been brought to dorsal recumbency. If this is the case, the surgeon should bring the patient back into lateral recumbency and afterwards into dorsal recumbency again. In doing so, the inner organs slide into another position and the sutures can normally be located afterwards. Only very few cases have to be forwarded for conventional surgery.

In case the sutures cannot be fixed in the right position postsurgery, it may help to bring the patient into an upright position and knot the bandage in the standing cow instead of fixing the gauze bandage in right-lateral recumbency.

In the standing animal, the abomasum will slide into its physiological position and can then be safely fixed. Sutures tensed over a longer period tend to cut the abdominal wall and relapses are pre-assigned.

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