Clinical Decision Making

Critically Appraised Topics (CATs) are a standardised, succinct summary of research evidence organised around a clinical question, using a form of evidence synthesis based on the principles of evidence-based medicine (EBM) and evidence-based veterinary medicine (EBVM). Access to CATs enables clinicians to incorporate evidence from the scientific literature into clinical practice and they have been used to teach EBVM at the University of Bristol’s School of Veterinary Sciences since 2011. Similar to BestBETs for vets (VR, April 4, 2015, vol 176, p360), CATs will also be regularly published in the Clinical Decision Making section of Veterinary Record.

Surgical management of left displaced abomasum in dairy cattle

Clinical scenario
Upon diagnosing a left displaced abomasum in an otherwise healthy fourth lactation Holstein cow on a 150-cow dairy farm, you must make a decision regarding treatment options. Your practice routinely performs both right-sided omentopexy and laparoscopy-guided abomasopexy, and your client wants to know which technique is likely to produce the most rapid clinical recovery.

The question
In [dairy cattle with a left displaced abomasum] does surgical treatment by [laparoscopy-guided abomasopexy compared with right-sided omentopexy] show [improved speed of clinical recovery]?

Search parameters
The search terms (cow OR cattle OR bovi*) AND left AND (displaced OR abomasum*) AND (laparo* OR right$flank) AND omentopexy were used.

Search outcome
- 17 papers found in CAB search
- 13 papers excluded as they did not answer the question
- Four total relevant papers from CAB
- Seven papers found in Medline search
- All papers were duplicates of those found in the CAB search
- Four total relevant papers from Medline
- Four relevant papers from both Medline and CAB Abstracts.

Study weaknesses:
No power calculation was reported, and the sample size was small. The study was not blinded due to the nature of postoperative wounds. Animals were hospitalised and intravenous fluids were administered for 24 hours following surgery, which does not reflect standard protocols used in the UK.


Paper 2: Effect of surgical correction of left displaced abomasum by means of omentopexy via right flank laparotomy or two-step laparoscopy-guided abomasopexy on postoperative abomasal emptying rate in lactating dairy cows (Wittek and others 2009).

Patient group: Lactating dairy cows with diagnosed left displaced abomasum without signs of concurrent disease, n=30.

Study type: Non-blinded, randomised controlled trial.

Outcomes: Rumen contraction rate, abomasal emptying rate following infusion with D-xylose and daily milk yield were measured for three days following surgery.

Key results:
The rumen contraction rate was significantly higher for three days after surgery in cows treated with laparoscopy-guided abomasopexy (P<0.05). The mean (sd) abomasal emptying rate was 192 (51) minutes for laparoscopy-guided abomasopexy, compared with 264 (94) minutes for right-sided omentopexy. This is significantly faster (P<0.05). Daily milk yield in the first three days following surgery was not significantly different between treatment groups, although an overall postoperative increase in milk yield was identified in cows treated with laparoscopy-guided abomasopexy.

Study weaknesses:
No power calculation was reported, and the sample size was small. The study was not blinded due to the nature of the postoperative wounds. Follow-up was limited to three days following surgery and therefore did not take into account longer term outcomes, such as recurrence. Cows received intravenous saline and glucose solution every 12 hours for 48 hours after surgery, which does not reflect standard protocols used in the UK.

Summary of evidence
Paper 1: Peritoneal inflammatory response to surgical correction of left displaced abomasum using different techniques (Wittek and others 2012).

Patient group: Lactating dairy cows with diagnosed left displaced abomasum, n=40.

Study type: Non-blinded, non-randomised controlled trial.

Outcomes: Rumen contraction rate, blood and peritoneal fluid biochemistry and haematology were measured for three days following surgery.

Key results:
The rumen contraction rate increased significantly faster in the laparoscopy-guided abomasopexy group compared with the right or left flank omentopexy groups (P<0.05). Creatine kinase activity increased significantly in the right and left flank omentopexy groups compared with the laparoscopy-guided abomasopexy group (P<0.05). No significant differences were found between groups in the number and differentiation of leucocytes in peritoneal fluid.

Papers 1 and 2 were reviewed and summarised in this Clinical Decision Making article.
Paper 3: Comparison of two-step laparoscopy-guided abomasopexy versus omentopexy via right flank laparotomy for the treatment of dairy cows with left displacement of the abomasum in on-farm settings (Roy and others 2008).

Patient group: Lactating dairy cows with diagnosed left displaced abomasum, with or without concurrent disease, n=253. All animals were patients of the University of Montreal’s Bovine Field Service.

Study type: Non-blinded, non-randomised controlled trial.

Outcomes: Appetite (as a percent of usual daily feed intake), comfort (comfortable vs. uncomfortable based on farmer opinion), and milk yield (measured by volume in relation to expected yield as very satisfactory, satisfactory or unsatisfactory) were measured.

Key results: There was no significant difference (P>0.05) in appetite between groups. There was no significant difference (P>0.05) in comfort between groups. There was no significant difference (P>0.05) in milk yield between groups.

Study weaknesses: Student involvement in some procedures may have affected results due to a likely increased surgical time and an increased risk of contamination with more than one surgeon, for example. Cows were not randomly allocated to treatment groups, and the study was not blinded. Two measured outcomes (comfort and milk yield) were subjective and therefore subject to bias based on the farmer’s interpretation of ‘satisfactory’. There was a significant difference between the treatment groups in the number of cows with acetonemia (ketosis) on the day of surgery.

Comments

The papers reviewed agree that both techniques are clinically viable options in treating left displaced abomasum. The evidence provided by the Roy and others (2008) study is the least robust because, despite having the largest sample size, the outcomes measured were subjective, and few attempts to reduce bias were stated. The Seeger and others (2006) study provides the strongest evidence to answer the question, due to the large sample size, quantitative outcome measures and longer-term measurement.

It is prudent to consider a range of factors when choosing a treatment, such as cost, surgeon experience, surgery time and the magnitude and likelihood of postoperative complications if they arise. Laparoscopic techniques have success rates slightly lower than, but approaching that of, right-sided omentopexy. However, when considering immediate clinical recovery (gastrointestinal function, milk yield recovery, appetite, inflammatory markers, etc.), laparoscopic abomasopexy is superior to right flank omentopexy.

Bottom line

Treatment of cows with a left displaced abomasum via a laparoscopy-guided abomasopexy produces a faster clinical recovery than via a right-sided omentopexy.

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