Endoscopy: a promising diagnostic and treatment tool

ONE of the biggest challenges that cattle clinicians face when examining sick cows is the limited number of means to achieve a definitive diagnosis.

Our biggest allies in this battle are our faithful thermometer, the reliable stethoscope, our observant eyes, the rectal palpation, a limited range of biochemistry on-farm tests (BHIB, ketone, blood constituents).

But most important of them all is our experience of previous cases. It has been accumulated over the years and helps us fill the gaps that stem from the clinical examination. As we are unable to directly examine every organ of the cow, it is fair to say that in general practice our hands are tied to some extent.

Reminiscing from my university days, one of the most enjoyable subjects was anatomy. I still recall one of the exam papers where we were faced with the hypothetical scenario of being placed in a cow’s limb (as in the film Innerspace) and we had to find our way back to the heart, via the arterial system. The purpose of this exercise was to name the arteries we would follow on route.

Putting this piece of nostalgia aside, what is evident nowadays is how much of that knowledge has become redundant since we qualified. In my opinion, the reasons for this diminishment are mainly commercially pressures. They are also due to the fact that we have very few means of conclusively examining most organs during a clinical visit.

General

Endoscopic applications are recognised and well-established techniques in human surgery, where a variety of procedures are performed routinely. Laparoscopy or celioscopy (from the Greek celia, meaning abdomen) is seen as a less intrusive and labour-demanding procedure.

The above procedures are not widely used in cattle surgery, although there is a small but increasing number of cattle practices that regularly apply the technique.

Today, there are mainstream and experimental applications of endoscopy in cattle. The most popular applications of the procedure are LDA corrections, RDA (non-volular) corrections, exploratory laparoscopy and exploratory thoracoscopy.

Amongst the less frequently used procedures are umbilical hernia corrections and ovarian cyst treatments.

**LDA corrections**

There are three different types of LDA laparoscopic correction, depending firstly on whether the animal is standing or in dorsal recumbency. Secondly, it depends on the number of portals used in each technique.

The three different types are named after their German inventors: Christiansen, Mayer and Janowitz (two-step method).

Christiansen is carried out standing with two portals, usually either side of the last left rib. The two-step method starts like the Christiansen and completes with two more portals ventrally while the patient is in dorsal recumbency. The Mayer was introduced as a bridge between the aforementioned methods. It is carried out while the cow is standing with three portals, the third in an intercostal space and vertically below the paralumbar fossa one.

There are a number of advantages in the laparoscopic correction of LDAs. As a matter of routine there is no requirement to use antibiotics or NSAIDs, unless of course an individual case warrants it. The portals are small (the biggest 13.5mm) and the overall intrusion is minimal, so that the risk of contamination is low.

Because the portals are so small, they do not need suturing at the end of the procedure. The surgeon can fully visualise the target organs, all that through an 8mm wide magnifying endoscope.

For the standing methods, only one assistant is required. The animal can join the herd at the next milking following the procedure. Completion of the procedure is in just under 50 minutes, expressed as arrival, examination, correction and departure from the farm.

The large investment cost is recouped by the quick patient recovery and higher subsequent milk yields. Comparing in our practice Grymer-Sterner corrected cases with laparoscopic ones and observing them for 120 days post-operatively, it appears that the latter gave 5.1 litres more milk per day (P > 0.05 Stata t-test comparing of medians).

On the other hand, laparoscopically corrected cases took longer time to conceive than the Grymer-Sterner ones, by 34 days (P > 0.05 Stata t-test comparing of medians).

It is not clear as to why this occurred; it is consistent though with poorer fertility accompanying increasing yields. Finally, the number of treated animals that exited the herd following the procedure is 9%, whereas for the Grymer-Sterner cases it is 11%. It must be noted that the difference between these results is not statistically significant.

We all have very good reasons as to why a specific LDA technique is our chosen method, and of course they are all correct. From experience, when laparoscopic LDA corrections are introduced, the laparotomic ones practically disappear.

**Exploratory laparoscopy**

Exploratory laparoscopy is a powerful prognostic tool where, with minimal intrusion, an abdominal condition can be investigated further. One or two small holes, while the cow is standing or in dorsal recumbency, allow us to further clarify cases of general “maligne” but more importantly to confirm whether any treatment is likely to succeed.

Farmers appreciate when notified of the futility of a case, let alone when they are able to see it for themselves. There is nothing worse in their eyes than a treatment bill and a dead animal!

**RDA corrections**

Non-volular RDAs can be corrected laparoscopically. The approach is similar to the Christiansen, the portals are located either side of the right last rib. The displaced abomasum is deflated and this must be accompanied by rehydration of the animal with large volumes of fluids in the ensuing 12 hours.

![Endoscopic kit.](image)

Sotirios Karvountzis, MRCVS, qualified at the University of Thessalonika in Greece in 1995 and is now a director at Shepton Vets in Shepton Mallet, Somerset. He holds the Dutch Diploma in Cattle Hoofcare, is a licensed member of the NACFT and DairyCo mobility mentor. His specific interests are cow fertility, lameness, surgery (conventional and endoscopic) and he uses ultrasound diagnostically in cattle and carries out bull semen tests.
Exploratory thoracoscopy

Exploratory thoracoscopy is an example where endoscopy and ultrasound can be combined to deliver a diagnosis. Your first exploratory thoracoscopy is likely to be inadvertent, you were aiming to get into the abdomen instead! It is important once finished to suture those portals, to reduce the risk of pneumothorax.

Epilogue

As our diagnostic skills are constantly reviewed and we continually strive for excellence, it is important to “think outside the box” when looking to facilitate our diagnoses. The combination of endoscopy and ultrasound would be a hugely beneficial outside the box when looking to deliver excellence, it is important to “think outside the box” when looking to facilitate our diagnoses.

Although endoscopy is more intrusive than ultrasound, it additionally allows observation of non-echogenic organs, as well as having a deeper penetration (50cm as opposed to the max ultrasound of 30cm), especially when the abdomen has been insufflated.

For those of you who are interested, VetSkills and Shepton Vets have put together a series of training courses on the procedure. For more information please contact VetSkills on 01765-608489 and speak to Lizzie or call Shepton on 01749-341761 and speak to Georgina.

References (Grymer-Sterren)


References (Laparoscopy)


Poster on preventing medicine residues in milk

The BCVA, in association with NOAH, VRC, RUMA, DairyCo, NFU, NMR, NML, and DairyUK, has produced and distributed a poster guide for milk producers entitled Best practice to prevent medicine residues in milk. The poster is an updated version of the practical guide to avoiding milk antibiotic residues that was last produced in 2007.

It has been distributed to all registered dairy producers in Great Britain with a postcard encouraging producers to “display the poster in a location that allows it to be used as a source of reference when treating milking cows with medicines”. It can be downloaded in pdf form from the websites of the endorsing organisations, including www.bcva.org.uk.

Film on body condition scoring

DAIRYCO has launched a new training film on body condition scoring (BCS). It can be seen on the DairyCo YouTube channel, covering the how, when and where of scoring, along with step-by-step instructions to achieve accurate and consistent BCS for the herd.

Designed in consultation with industry and produced under the umbrella of the DairyCo Research Partnership, led by Nottingham University, this resource sits alongside the score card and recording sheets already available. The paper-based materials can be ordered or downloaded from the DairyCo website, www.dairyco.org.uk.