



The ins and outs of abdominocentesis

Lisa Hulme-Moir of Gribbles Veterinary, Auckland, outlines some traps when performing abdominocentesis in cattle.

THE COLLECTION OF peritoneal fluid for analysis is a method widely used as part of the workup for abdominal disease and abnormal fluid accumulations in small animals and equids. It also has utility in cattle for the diagnosis of intra-abdominal disorders, particularly for the diagnosis of peritonitis and other less common conditions such as uroperitoneum and neoplasia.

Owing to our focus on herd-based medicine, it is rare to see abdominal fluid from cattle submitted to the laboratory. But there may be times when you have considered performing abdominocentesis to see whether you can obtain fluid that grossly appears consistent with peritonitis. Regardless of whether you send the sample to the laboratory or not, here are some important points and traps

FIGURE 1: Abdominocentesis in adult cattle. Abdominal fluid can be collected from both the L and R sides, from either the cranial or caudal quadrants of the abdomen. The midline is avoided, as this will often result in puncture of the rumen. The L cranial site is located approximately 5cm cranial and 3cm medial to the foramen of the milk vein (arrow). The L and R caudal sites are just anterior to where the udder attaches to the abdominal wall (square). The R cranial site is approximately 20-30cm cranial to the R caudal site. The skin over the site should be clipped and sterilised, with a tail jack applied for additional restraint. Centesis is performed using an 18- to 20-gauge, 4-5cm needle and 5-10ml syringe. If fluid is not obtained on initial suction, rotating the needle or redirecting it one or two times may be helpful.

you should be aware of when performing abdominocentesis in cattle.

TRAP NUMBER 1: *I didn't get any fluid, so this cow doesn't have an effusion.*

False. Peritoneal fluid can be difficult to obtain from cattle for a couple of reasons.

Firstly, a large volume of the abdomen is occupied by the rumen, and in clinically healthy cattle it is not uncommon for abdominocentesis to be unsuccessful.

Secondly, cattle have a great ability to seal off areas of inflammation with fibrin and omentum. Cases of peritonitis can therefore be localised to pockets of fluid rather than diffuse effusions.^{1,9}

Consequently, a dry tap does not rule out that the cow has an effusion or peritonitis.

Ultrasound can greatly improve your chances of identifying accumulations of fluid in the abdomen, and these are generally easy to recognise even for

inexperienced operators. If ultrasound is not available, abdominocentesis can be attempted from either the right or left cranial or caudal quadrants of the abdomen in adult cattle (Figure 1).^{6,8}

Abdominocentesis in calves is generally performed on the right-hand side, with the calf in left lateral recumbancy (Figure 2).³

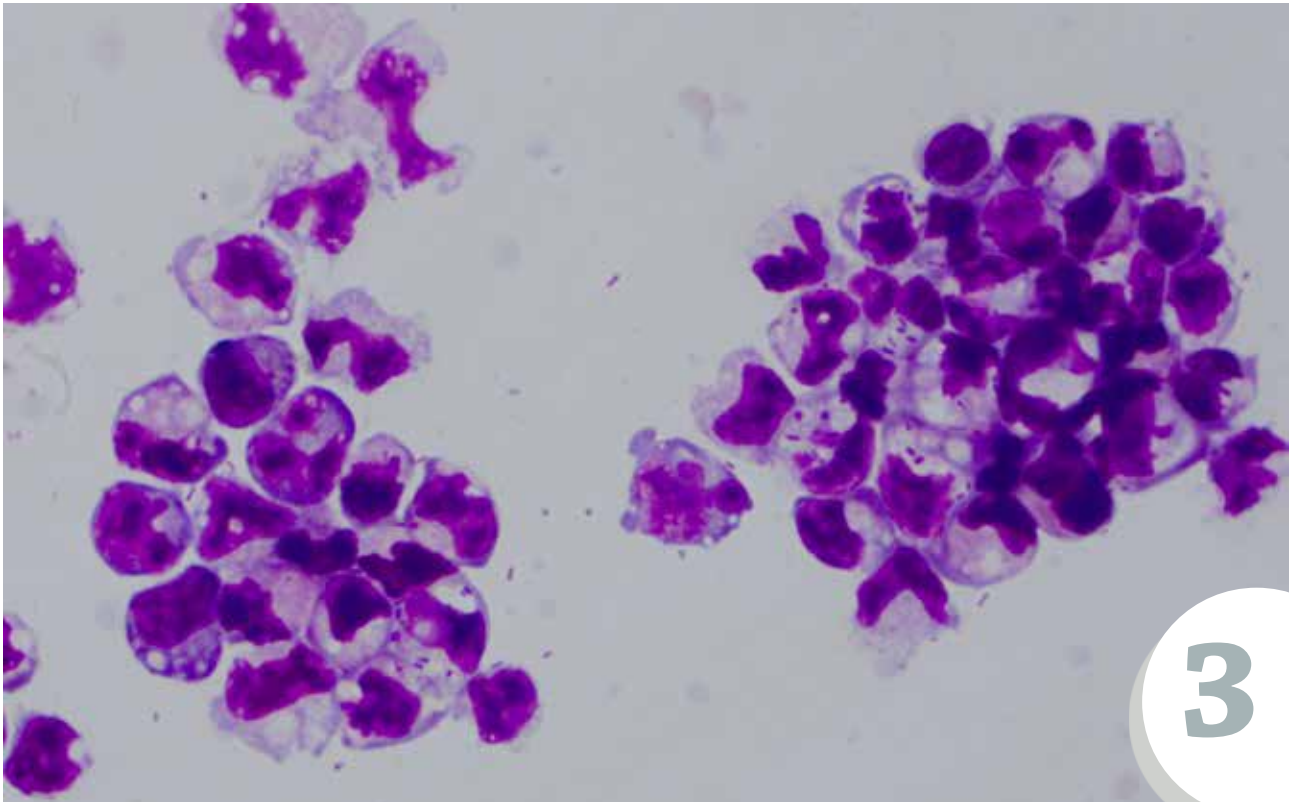
The selection of which site to use depends partly on the area of the abdomen you suspect to be diseased (eg the left cranial quadrant is appropriate in cases of traumatic reticuloperitonitis), and what is easiest in the facilities you are using. Attempting abdominocentesis from more than one site will also increase the chance of obtaining fluid.⁶

TRAP NUMBER 2: *The fluid I've collected looks nice and clear, so this cow does not have peritonitis.*

False. Cattle are unusual in having significant overlap in the characteristics of normal peritoneal fluid and that

FIGURE 2: Abdominocentesis in calves. Abdominocentesis is performed with the calf in left lateral recumbancy. Sedation is generally required unless the calf is very weak and the site should be clipped and sterilised. Fluid can be collected either just dorsal to the umbilicus (site 1) or, if this is unsuccessful, from the inguinal area (site 2). When collecting from site 1, the needle is directed slightly caudally and parallel to the abdominal wall once it has entered the abdomen. At site 2, the needle is directed slightly cranially towards the midline, again keeping parallel to the abdominal wall once the needle has entered the abdomen. Centesis within one hour of feeding carries a higher risk of accidental puncture of the abomasum.⁷ This rarely has any deleterious effect on the animal. Contaminated fluid is usually cloudy yellow, with large white clots, a smell of digested milk and a low pH (< pH 7).





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FIGURE 3: Peritonitis in a calf. Highly degenerate neutrophils are observed, with bacterial rods seen both extracellularly and phagocytosed within cells. 100x objective.

obtained from cases of peritonitis.^{1,4,5,10} Fluid obtained from cases of peritoneal fluid can vary from slightly hazy and straw-coloured to cloudy and purulent, and the cell counts can be very low. Microscopic examination to look for elevated neutrophil percentage, degenerative changes in the neutrophils, and bacteria is therefore needed to rule out peritonitis (Figure 3).

What about the sniff test? Fluid obtained from cases of peritonitis can smell putrid, and this is a useful indicator of the presence of infection. But the absence of aroma, as with lack of cloudiness, does not rule out peritonitis. Similarly, it is important

to note that only a few cases of uroperitoneum smell of urine.²

Therefore, if you have a recently calved cow you suspect of uroperitoneum, send a sample of peritoneal fluid and red-top blood to the laboratory, where creatinine measurement can be used to confirm a diagnosis.

In conclusion, remember if you are unsuccessful in obtaining fluid on abdominocentesis, this does not rule out the presence of an effusion. Avoid the midline, as this will usually be unsuccessful, and consider submitting any collected fluid to the laboratory if it appears grossly normal – you may obtain additional information that will be useful in making treatment decisions. ^{VS}

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