

Speaker 1:

This podcast is about management of abscesses and large animal species. The primary principle of abscess management is ventral drainage. If the abscess isn't opened or if the opening is above the floor of the abscess, the abscess will generally continue to exist. Antibiotics are generally not necessary if drainage can be obtained, but many graduate veterinarians have a hard time with this. Antibiotics are indicated if the animal shows signs of systemic infection, fever and white blood cell changes despite drainage, if ventral drainage is impossible, or if vital structures are at risk, such as infections potentially getting close to the pleural cavity, mediastinum, abdominal cavity, or joint.

Regional antibiotics, including infusion into the abscess, tend to be more effective than systemic antibiotics. Many antibiotics cannot readily penetrate an abscess capsule and/or may not be effective in the abscess environment, even if they get there due to pH changes and other factors in the pus.

Remember, your antibiotic choices are limited in food animals and require strict attention to withholding times to protect food safety. If an abscess doesn't respond to drainage, it is more often due to foreign material in the wound than it is to the bacterial infection itself. Ultrasound can be very useful to identify the extent and ventral aspect of an abscess if you have it. Ultrasound also shows blood flow, which is often increased and allows you to avoid large vessels when incising the abscess.

Abscesses usually shown mixed echogenicity and a capsule is often visible. Gas in the abscess indicates either an opening to the environment or an anaerobic infection. Ultrasound is also useful for identifying foreign bodies and bone sequester that are preventing healing in chronic abscesses. However, it isn't useful when there's gas in the wound. So do your ultrasound exam before you make any holes.

So to create ventral drainage of abscesses. Step one, identify a site that is safe, not in or through an important structure and most likely to be abscess. You can identify this through ultrasound, visual inspection, the lowest part of a swelling and/or palpation, feeling for a soft spot. It is ideal if this is ventral, but that isn't always possible or necessary. Inject lidocaine for local anesthesia.

Step two, insert a large gauge needle. This must be at least 18 gauge for horses and at least 16 gauge for cattle, through the local block into the abscess to confirm pus. If pus is obtained, a second needle is inserted at least a centimeter away. Two to three centimeters is better. And if this needle also yields pus, connect the two sites via sharp incision with a scalpel blade. If no pus, try again and return to step one with your ultrasound.

Step three, collect a sample of pus for culture and sensitivity, particularly in goats and horses.

Step four, explore the abscess cavity to determine if the incision is ventral enough and/or where a ventral incision be created. Digital palpation is ideal. Put your finger in there, feel around. Poke to see where ventral drainage needs to be made and then make it there. Sterile probes can also help identify the extent of the abscess cavity and drainage sites. If needed, the original incision can be extended to allow better inspection or drainage and have a finger or probe evaluate the pocket makes this safer. So make your initial hole big enough to get your finger in and then figure out where you need to go.

Step five, enlarge the incision if needed. Ideally, ventral drainage is created with a big enough incision made to allow the wound to heal from the inside out. Cattle close holes really quickly. Be very generous, but safe with the size of the incision. Make it as big as you can.

Step six, flush with copious amounts of fluid. The solution to pollution is dilution. Tap water is better than no flush and tap water is better than isotonic sterile solutions because of the isotonicity. Adding colored things to the tap water does not usually help. Five liter LRS bags are great and they are sterile. Bottles of saline are okay too. But just a lot of flush solution is best.

And then keep the wound open until it does heal from the inside out through flushing or packing. You could put gauze in there to hold the wound open and pull it out a little bit each day, kind of a wet to dry bandage. Sugar and honey are also great for keeping wounds open and cleaning them up at the same time. Otherwise, just that solution to pollution is dilution and keep flushing it.

Common mistakes. Insufficient ventral drainage. The incision is not made at all. It's not made ventrally or it's not made big enough.

Common mistake two. Flushing with irritating solutions that make things worse. Hydrogen peroxide is horrible for wounds, despite what everybody does out there. Great for contacts, horrible for wounds. It dissects through the blood planes and makes the abscess even bigger.

Flushing with tincture of iodine or strong iodine solutions are more damaging and not as helpful. It requires dilution of iodine to free up the iodine to make it effective. So weak tea Betadine solutions are way better than strong tincture of iodine solutions.

And three, that the abscess stuff pus can actually contaminate the environment. This is particularly important in goats and horses. Most wound infections, abscesses due to wounds, will be inhabited by multiple species of bacteria and should be cultured to determine antibiotic selection. If you think antibiotics are going to be needed, but generally they aren't. Abscesses relating to infectious organisms such as *Corynebacterium* are less common, but are important to identify, to prevent further spread.

The majority of bovine abscesses, regardless of the cause, will be infected with *Trueperella pyogenes*. This agent is sensitive to most antibiotics. However, it creates a thick-walled abscess that makes antibiotic penetration difficult. So the sensitivity is measured in vitro and in vivo it doesn't work. It's also very hardy in the environment, *Trueperella* is. Try to collect the pus during surgery or separate the animal while the abscess is draining.

Sheep and goats with abscesses may be infected with *Corynebacterium pseudotuberculosis* and have CLA or caseous lymphadenitis. Sheep with CLA tend to develop onion-like abscesses, firm layered pus and are prone to internal abscesses. While goats get creamy, white pus-filled lesions and are more likely to just have external abscesses but can get lung abscesses. The abscesses are generally infected lymph nodes. This organism is also very infectious and very hardy, generally culling of all infected animals and avoiding placing new animals in the environment for at least eight months is required to control this disease. Most owners do not like this idea.

Lancing abscesses will lead to more environmental contamination. Removing abscesses surgically can rapidly become expensive due to the frequent incidence of new infections in the herd, both in the same patient and in other patients. Tulathromycin injected into the lesion or subcutaneously into the goat help resolve lesions in one study. But we've not found it very effective.

Culturing small ruminant abscesses is important, and client education is a crucial part of therapy. *Corynebacterium pseudotuberculosis*, equine serovar is a growing problem in horses and leads to superficial and internal abscesses. This disease has been localized to California and other western states in the past, but is now spreading as the vectors involved in its transmission and enjoy global warming. The vectors are likely horse flies, stable flies, and house flies. The most common presentation is abscesses in the pectoral or ventral abdominal area leading to the name pigeon fever as the horses look like they have large pigeon like breasts. It can also lead to ulcerative lymphangitis on the limbs of affected horses.

Horses in endemic regions may actually have some resistance to the organism, so as it enters new territory, it may become more virulent. Most cases are seen in the late summer and fall, but it has been identified year-round, and the seasonality may be shifting to mid-summer months. This version of the

organism is also very hardy in the environment and can survive at least eight months as well. Affected animals should be isolated. Unfortunately, *Corynebacterium* species can infect people too.

Horses with abscess lymph nodes may also have strangles, streptococcus equi. The lymph nodes in the head are most commonly affected, but the infection can affect any lymph node. If the horse's nasal discharge or if there's a history of strangles in the barn or the community, strangles should be at the top of your differential list and appropriate precautions taken to limit its spread. You and your vehicle can be fomites.

Other bacterial and fungal organisms can also create abscesses in all species. Most of these are easily spread between animals both of the same species and across species lines, including humans. We have seen blastomycosis infections in horses in this area. Cytology and culture can help figure out what you're dealing with. Chronic abscesses may need a specialist. If the abscess isn't resolving. First check is there adequate ventral drainage? Has a pocket formed? Is the ventral aspect just not cleaning up? Can ventral drainage solve the problem? Then ask, is there systemic disease? Is there a risk of *Corynebacterium* or streptococcus going on in this animal? And third, is there a foreign body or sequestrum possibly in the wound?

Sequestrum generally developed after trauma, but chameleons can develop spontaneous bone sequester, particularly in the head. As the body tries to resolve these sequestra, basically, pieces of dead bone, sterile abscesses develop. More often though chameleons develop abscesses in the jaw region from infected teeth. Resolving these abscesses will require removing the tooth, tooth root, or bony sequestrum. Foreign bodies can be left in wounds from the initial trauma, such as a stick and be leading to chronic abscess formation, or they could have been added by vets.

Suture. Remove the foreign body to resolve the problem.