Handling, Restraint and Field Anesthesia of Camelids

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While camelids are much easier to work with than many traditional livestock, these animals can be challenging at times when it becomes necessary to handle them. To help you as you begin working with these interesting animals, here are a few handling guidelines that should be used. These guidelines will make working with camelids much easier on both you and your llama or alpaca, and they will make any veterinary visits go more smoothly.

One of the most important aspects of camelid behavior to remember is their herding instinct; both llamas and alpacas are extremely herd-oriented animals. This can be both an advantage and a disadvantage as we work with them. One of the benefits of their strong herding instinct is that this can make moving groups much easier. The animals will tend to stay together and make less work for us as we move them. A disadvantage of this behavior is that it makes it difficult to single animals out for individual treatment.

Perhaps the most effective way to overcome this is to use a series of catch pens that gradually become smaller, until you are able to separate individual animals. Avoid making sudden movements that can be interpreted as threatening gestures as this may frighten the animals and make it much more difficult to catch those that you need. As you single out the individual that needs your attention, approach the animal slowly and take hold of the neck. This will allow you more control over the animal, as it will likely try to escape your grasp. For a secure hold that will be safer for you and the animal, place the head in the crook of your elbow and pull it close to your shoulder.

When properly trained, use of a halter on llamas and alpacas can be invaluable as a handling tool. Training consists of getting the animal used to handling and used to the halter from an early age. Proper halter fit is essential for its use; this is necessary due to camelid nasal anatomy. A good portion of the nose directly behind the nostrils is cartilage rather than bone. Improper halter fit can lead to pinching of the nasal passage and panic in the llama or alpaca as these animals mostly breathe through their nose. Make sure the halter is sized appropriately for a llama or alpaca and that the halter rings are almost to the corner of the eyes. This position will assure that the noseband is sitting past the cartilage on bone. Now you may use a lead rope to direct the animal, giving them an appropriate amount of slack in case something should startle the animal.

Another restraint method used for alpacas is to rest your other hand on the point of the shoulders at the base of the neck and gently but firmly press downward. This should help you to control the animal and keep it still for any treatments necessary. For an animal that is continuously swinging around and not standing still, you may use your free hand to grasp the base of the tail to help hold them in one place. You may also have another person do the same for you, especially with larger animals.

A unique camelid behavior that can be used to our advantage in handling is the "kush." This is a term for sternal recumbency, in other words, when the animal lays down with its legs up underneath its body. Depending on the animal, some llamas and

alpacas will cush when you grab their tail, when they are stressed, or for no obvious reason. When the animal does go down while you are trying to handle it, allow it to do so and simply restrain the animal and apply light pressure to encourage it to maintain the posture. This handling method works well when multiple people are in the pen; one or more people can help to hold the animal while another performs the procedure. While not the least stressful handling option, it can be useful when an animal is not willing to submit to any other forms of restraint.

When additional control or restraint is required for short periods, one of the easiest methods is "earing". This technique involves bringing the hand not involved in head restraint up along the animal's neck and grabbing the outside ear. Do not use a twisting motion to control the animal, rather, simply squeeze the base of the ear firmly and hold as the animal is treated.

These are just a few handling tips that will help to make working with your new llama or alpaca go more smoothly. When you become more comfortable with these procedures and camelid behavior, your experiences as an owner and handler will be much more enjoyable. These skills will also be useful in the event that your llama or alpaca becomes ill; continuing care will be more easily accomplished when you are able to give the medicine prescribed by your veterinarian. When you have questions on animal handling, remember to ask other owners or your veterinarian. They can assist you in becoming better at working with these unique animals.

Field Anesthesia Techniques in Camelids

A regularly encountered subject during consultation with veterinarians in the field, involves recommendations for chemical restraint and analgesia to accomplish various procedures in camelids. Relative unfamiliarity with the species and potentially the drugs used, present an uneasy feeling when preparing for the task at hand. Single drugs or combinations of α_2 agonists, opioids, ketamine with or without local anesthetics are excellent and safe methods for sedating, anesthetizing and providing analgesia in camelids. With camelids, physical restraint alone when performing painful procedures, may pose greater risks to the welfare of the patient than anesthesia or sedation. Where financial and slaughter constraints may factor into client reasoning for physical restraint to trump drug use in traditional food animal species, analgesia is an expectation of the camelid client.

Debating ethics, economics, or legalities of pain management in animals are beyond the scope of this presentation. We have little validated means of documenting and quantifying pain in animals and therefore have little scientific guidance for how analgesics should be used or if they work as we think they do. Nor does a plethora of scientific data on kinetics and dynamics of anesthetic drugs used in camelids exist. Public perception, common experience of pain, and strengthening animal welfare standards of care, warrant discussion of ways to use analgesic agents as adjunct therapeutics in food animal practice.

Procedural Pain

It is well documented that analgesics are more effective when given before the initiation of the pain cascade. We do not have control of this in naturally-occurring

disease. We do, however, have absolute control over this when we will be performing what we know to be painful procedures. In order to provide the most effective analgesia, our analgesic agents must be given before beginning the procedure.

Castration All castration methods cause acute pain. In camelids, frequently we choose to perform castration in recumbency. The cocktail we use at KSU for castrations or any other procedure where recumbency is desired utilizes an IM combination of butorphanol + xylazine + ketamine: These drugs are combined into one syringe and given intramuscularly which avoids the inherent difficulties of intravenous injection in camelids.[Table 1 Note, alpacas appear to be slightly more resistant to sedation than llamas and among alpacas – suris seem more resistant to the effects of sedative drugs than Huacayas.

Table 1. Short term general anesthesia for llamas and alpacas using injectable drugs.

Alpacas	Butorphanol 0.04 mg/kg	Xylazine 0.4 mg/kg	Ketamine 4 mg/kg
Llamas	Butorphanol 0.03 mg/kg	Xylazine 0.3mg/kg	Ketamine 3 mg/kg

If I am performing "mass castration" on 3 or more animals, I will make up a bottle of the cocktail. To a 1 gram (10ml) bottle of ketamine, add; 10mg (1ml) butorphanol and 100mg (1ml) of xylazine. This mixture is then dosed at 1mL/40# (18kg) for alpacas, or 1ml/50# (22kg) for llamas. In my experience, very few of these animals, if handled quietly and plenty of time is given before starting the incisions, will need additional local anesthetic of the scrotum or spermatic cords. Expect 20 minutes of surgical time and the patient should stand 45 min to 1 hour after injection.

I also have performed castrations standing by giving 0.4 mg/kg xylazine IM in alpacas and then infiltrating 1-1.5mL of 2% lidocaine into the median raphe of the scrotum and 2-3mL lidocaine into each spermatic cord. Many animals will lay down with this protocol when placed in a chute, likely behavioral and not related to over-sedation. Nevertheless, control over position and procedure is decreased.

Another method for standing castration utilizes intramuscular butorphanol (0.15 mg/kg IM) in combination with local lidocaine anesthesia as described above. Butorphanol alone will not cause the degree of sedation as xylazine, and the patient will appear alert. The butorphanol should be administered 10 minutes before local anesthesia and castration to allow time for it to take effect.[1]

Additionally, caudal epidural may be used for routine castrations. A clinical study reported on three different methods in alpacas. Method 1; 1.5 mL of 2% lidocaine epidural, which provided perineal analgesia in 2 minutes, but did not alleviate discomfort associated with exteriorization of emasculation of the testicles. Method 2; used 20mg of 20mg/mL xylazine IM and 1 mL lidocaine as an epidural, both 10 min before surgery. This also did not fully alleviate discomfort associated with emasculation. Method 3; used 20mg/mL xylazine added 1:1 with lidocaine, with 0.75mL of the total solution given epidurally. This also did not fully anesthetize the spermatic cord. It is believed that such low-volume caudal epidurals do not move cranially enough to block the lumbosacral

plexus, which feeds the structures of the spermatic cord. So, caudal epidurals should be increased in volume, or lidocaine should be infiltrated into the spermatic cords prior to emasculation or ligation.[2]

The procedure used for castration also has some effect on pain responses. A publication reported that prescrotal castration, with primary closure, resulted in less incisional pain than did bilateral scrotal castration left open. Prescrotal castration does take longer, controlled patient positioning, and requires more attention to sterility, but may be most appropriate for some owners and during fly season.[3]

Wound / Fracture/ Treatment of Limbs

Regional IV anesthesia of the foot may be attained by placement of a tourniquet proximal to the fetlock with injection of 5-10 mL 2% lidocaine into any superficial vein. A 20ga butterfly catheter is sufficient, but for repeated infusions, an IV catheter may be placed. Alternatively, for more proximal lesions, the tourniquet may be placed proximal to the carpus or hock and 10-15mL of lidocaine infused into a vein.

An interdigital block for foot analgesia may be performed by using an 18ga, 1-1.5" needle inserted into the dorsal interdigital space of the foot where the interdigital skin forms a "v" and directed toward the heel, parallel to the coronary band. The needle should be long enough to nearly exit the interdigital skin at the heel. Withdraw the needle, while injecting 5-10mL of lidocaine to anesthetize the axial nerves. Aspirate occasionally to avoid intravenous lidocaine injection. Abaxial nerves may be palpated on the medial and lateral aspects of the fetlock. 2-3mL of lidocaine injected over each of these nerves, in addition to the interdigital block, provides complete foot anesthesia.

Dystocia

Dystocia is mentioned here as there are some important things to keep in mind when selecting analgesics and sedatives. Low volume lidocaine caudal epidurals (1 mL/90 kgs) are most commonly used, but do not block the cranial vagina and cervix, and therefore may not provide analgesia sufficient to reduce straining and adverse behaviors. Higher volumes (2-3mL/adult female alpaca) provide a greater area of analgesia, but may result in some temporary loss of motor function to the hindlimbs. Butorphanol 0.05mg/kg, IV is an excellent analgesic and sedative in addition to a lidocaine caudal epidural. α_2 agonists should be avoided systemically or as part of an epidural when attempting to deliver live crias, as, in cattle studies, they have been shown to sedate the calf and reduce uterine blood flow and oxygen delivery. In the situation where dam sedation is required, acepromazine (0.02mg/kg, IV) is a better choice, although it does not provide analgesia.

The author does use xylazine for management of uterine torsion and cesarean section (see field surgical techniques proceedings by author at this conference) despite the potential risks to the fetus. However, by utilizing a combination of butorphanol for these procedures, the volume of xylazine can be reduced. Recognize the potential adverse affects on the fetus and be prepared for management.

For most procedures encountered in camelids, combinations of drugs are administered in camelids for full benefit of anesthetic and analgesic properties. The author utilizes xylazine alone frequently for short, painless procedures. Combinations of xylazine, butorphanol, and ketamine are used for field procedures which may be painful

and require recumbent of up to 30 minutes. Additional local anesthetics/analgesics greatly enhance patient comfort and smoothness of anesthesia.

"Ketamine Stun"

Eric Abrahamsen and I have been developing an injectable chemical restraint technique to provide an enhanced level of patient cooperation and analgesia. It is called "the ketamine stun" because patients under its influence generally appear quite awake, though they are much more cooperative. We have been experimenting with various approaches to provide these benefits in both the standing and recumbent patient. These techniques are still under development and are offered here in hope that your experimentation with them will enhance all of our abilities to meet the needs of the ruminant patients in our practices. The level of analgesia varies from patient to patient and should not be counted upon for surgical procedures normally requiring a local anesthetic block.

For standing procedures in llamas and alpacas, a combination of xylazine (0.1 mg/kg), ketamine (0.2 mg/kg) and either butorphanol (0.05 mg/kg.) or morphine (0.1 mg/kg.) is administered IV or IM. Morphine is much more cost effective and we have not found its use to alter the results of the technique. Peak level of patient cooperation and analgesia will extend for approximately 15 minutes following the administration of the drug cocktail. An additional half dose of ketamine can be used to extend duration another 5-10 minutes.

When recumbency is desired we increase the doses of the xylazine (0.3 mg/kg.) and ketamine (0.6 mg/kg) used in the protocol. These patients will appear awake in most instances, but will be much more cooperative than when physical restraint (alone or with xylazine) is used. As with the standing approach, additional half doses of ketamine can be used to extend the duration of patient cooperation and analgesia. Patients are often able to stand and walk upon completion of procedures using this restraint technique. We have found this technique very useful for improving both minor procedures such as casting fractures and as a supplement during more major surgeries using a local anesthetic block.

References

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