Case 1 (Weight Loss and Anemia in an Alpaca)

This case is used as an example of a common presenting complaint for the practitioner that works with new word camelids (NWC). Early signs of weight loss and anemia can go undetected in llamas and alpacas which complicates prognosis. Gastrointestinal parasites and poor nutrition are often times responsible for the clinical signs described here. However, other differentials should be considered when working up these cases:

- **Paratuberculosis or Johne’s disease:**
  South American camelids can be infected with bovine or ovine (less common) *Mycobacterium avium paratuberculosis* and develop clinical disease. Affected animals are often 2 or more years of age since the incubation period is long. Weight loss in spite of a good appetite seems to be the most common clinical sign. Diarrhea may or may not be present. Hypoalbuminemia is a common finding in animals with clinical disease. The disease does not seem to be as prevalent[1] as it is in cattle which may have to do with the fact that camelid feces are more formed than cow feces and with the fact that diarrhea is not such a common clinical sign which makes fecal oral transmission less likely. Diagnosis can be reached by fecal culture, PCR, or AGID. Risk factors may include feeding bovine colostrum to crias and exposure to feces from infected cows, small ruminants, llamas or alpacas.

- **Eosinophilic Enteritis**
  Inflammatory bowel disease (IBD) is well described in small animals and horses. Even though this condition is not commonly seen in llamas and alpacas, it should be considered as a differential for cases of weight loss and hypoalbuminemia in spite of a good appetite. Affected animals may have intermittent clinical signs and some may have diarrhea. This disease can be diagnosed with an intestinal biopsy during an exploratory laparotomy or it may be a necropsy finding. Affected animals sometimes respond to treatment with steroids. More research is needed to identify the proper dose but the author and other clinicians use prednisone at 1 mg/Kg PO q 24 hours.

- **Mycoplasma haemolamae**
  This is a rickettsia that attaches to the red blood cells in llamas and alpacas and can cause anemia and weight loss. Nevertheless, many animals that are infected do not show clinical signs. Little is known about the mode of transmission. There are few reports that
support in utero transmission[2] but horizontal transmission seems more important. No specific vectors have been identified to date but the high prevalence of the disease supports vector transmission since practices that facilitate iatrogenic transmission (rectal palpation, shared needles, etc.) are not very common in these species. PCR is the gold standard for diagnosis. The disease has been reported in Peru, England, Austria, United States, and other countries, with the prevalence ranging from 15% to over 30%[3-5]. Animals that test positive and show clinical signs can be treated with oxytetracycline. The efficacy and length of treatment has not been established in animals with clinical disease. A common approach to treatment is oxytetracycline (200 mg/ml) 20mg/Kg., SC q 48 hours for 8 days (4 injections total). Animals that have undergone treatment may test negative post treatment but they often times test positive again in the future suggesting that they may remain carriers and not fully clear the infection. Also, one study revealed that, in alpacas without clinical signs, treatment with oxytetracycline was not associated with faster clearance of the organism[6].

- Other

Other differentials to consider for cases with chronic weight loss include, neoplasia and GI ulceration. The most common neoplasia seen in camelids is lymphoma and the most common intestinal neoplasia is squamous cell carcinoma. The prognosis is poor for both of these. Neoplasia should be considered in animals of any age since lymphoma has been reported in crias, adults, and elderly animals.

Clinical Approach: As mentioned above, weight loss is often times missed by the owners and by the time that a veterinary consult is made the condition may be very difficult to reverse. A thorough physical exam, including an oral exam should be performed. Euthanasia should be considered for animals that are cachectic and unable to rise, especially if the client has financial constraints. If euthanasia is not an option, one should consider referring severe cases so that more intensive care, such as parenteral nutrition, can be implemented if considered necessary. Lactation and cold weather can increase the energy demands to over 50%. Regardless of the cause, an effort should be made to decrease energy demands (avoid extreme temperatures, wean the cria, minimize exercise, etc.). A fecal exam should be done and a parasite control program implemented if needed. BVDV should be ruled out, especially in younger animals that look unthrifty to rule out PI status before performing costly diagnostics and treatments. A Mycoplasma haemolamae PCR should be submitted. If antibiotic therapy is considered necessary (based on physical exam and CBC findings) empirical treatment with oxytetracycline can be implemented. When faced with cases of weight loss in spite of proper nutrition other differentials (neoplasia, Johne’s disease, eosinophilic enteritis, etc.) need to be considered. Abdominal ultrasonography, abdominal radiography, and abdominocentesis should be considered when neoplasia is suspected. If other conditions have been ruled out and eosinophilic enteritis is suspected, treatment with steroids should be considered. There are no pharmacokinetic studies in camelids to date so the dose suggested above for Prednisone (1mg/Kg) is based on clinical experience. Long term therapy with steroids can result in complications and may worsen clinical signs in animals with Mycoplasma haemolamae. Recognize that some animals may test negative but they may be carriers so retesting may be indicated if clinical signs (weight loss, and anemia)
worsen after starting treatment with steroids. Supportive care (fluid therapy, blood transfusion, B vitamins, iron supplement, gastroprotectants, etc.) should be implemented as considered necessary.

**Case 2 (A novel approach to Urolithiasis in a Goat)**

This case shows a novel approach to a common problem. Urolithiasis is one the most common emergencies that veterinarians have to deal with in small ruminants. Affected goats and sheep typically form several small stones that do not cause obvious symptoms when present in the bladder but if one or more stones get lodged in the urethra the animal will be unable to urinate which will lead to severe pain and eventually death unless treated. Some of the risk factors associated with this condition include: sex (almost exclusively seen in males), anatomy (the sigmoid flexure and the urethral process are the most common sites for stones to get lodged), diet (high grain diets are known to increase the urine pH and can favor the development of struvite stones. High calcium diets and certain plants can be a risk factor for the development of other urinary stones), decreased water intake (will result in a more concentrated urine and settling of urine in the bladder favoring the formation of stones), and early castration (has been associated with poor urethral development facilitating urinary obstruction[7]).

Diagnosis is based on signalment, clinical signs, ultrasound (distended bladder or free fluid in the abdomen in the case of a ruptured bladder), bloodwork abnormalities (azotemia, high potassium, low sodium), and/or x-rays. Radiographs can be very valuable and are indicated when calcium stones are suspected. The presence of radiopaque stones and their location will help the surgeon determine the most appropriate surgical option for that particular case.

Urolithiasis is considered a medical emergency and treatment almost always requires surgery. Unfortunately, the urethral recess impedes catheterization of the bladder through the urethral opening. Amputation of the urethral process may result in urethral patency. However, re-blockage with other stones is likely. NSAIDs and other nephrotoxic drugs should be avoided until normalizing renal values and until the urinary blockage is resolved. Tube cystostomy is commonly performed to address urolithiasis. Nevertheless, some times a second surgery will be required if the urethral stones cannot be passed or dissolved. Other options include perineal urethrostomy (PU) and bladder marsupialization. Perineal urethrostomies can stricture over time, and, if the urethral opening is too large, urine will run down the animal’s legs causing urine scalds. Bladder marsupialization is considered a salvage procedure. Common complications associated with this procedure include urine scalding and ascending urinary infections. A new approach consists in marsupializing the bladder to the proximal aspect of the prepuce after amputating the penis (vescicopreputial anastomosis) [8]. Animals that undergo this procedure will be incontinent, but urine scalds will be prevented since the urine will be dripping out of the prepuce. In short, the apex of the bladder is pulled through a paramedian abdominal incision and then sutured to the body wall. The proximal end of the prepuce is then freed from the skin and abdominal wall and a circumferential incision is made where the penis connects with the preputial sac. The penis is resected, a stab incision is made at the apex of the bladder, and an 8
inch 22-gauge Foley catheter is inserted through the distal preputial opening and into the bladder. The proximal free end of the prepuce is anastomosed to the bladder. It is recommended to leave the Foley catheter in place for 3 to 4 weeks to prevent strictures at the anastomosis site. So far we have performed this technique in 4 goats. One goat had to be taken back to surgery due to stricture at the anastomosis site, two goats were doing well on follow up 6 months after surgery, and one goat died of hydronephrosis after stricture.


