



The Cutting Edge of Veterinary Surgery

David C. Sweet VMD, Diplomate ACVS

Greetings from the OR. I'm delighted and honored to be joining the OSVS staff and I'm looking forward to meeting and working with everyone. Please let us know what we can do to continue to improve our service to you, your clients and your patients.

I thought for my first contribution to the OSVS Vitals Newsletter I would share with you some of what I came away with from recent meetings.

Chylothorax:

This was one of the most exciting items discussed at the most recent ACVS symposium in San Diego. Dr. Theresa Fossum from Texas A&M presented her work in this area. She is now performing pericardectomies on cases with idiopathic chylothorax and reporting resolution of the chylous effusion in a number of dogs and cats. Several members of the audience also reported excellent success using this procedure. Admittedly, many are combining it with other procedures (including thoracic duct ligation) so it is difficult to attribute all of the success to the pericardectomy. The success rate, however, seems much higher than it has in the past with any of these other procedures alone. I am excited that we may actually be able to help many of these animals. The theory put forth explaining the effect of this procedure is that there is an increase in right heart pressure which elevates systemic venous pressures, and these abnormal venous pressures may act to impede drainage of chyle into the cranial vena cava while increasing lymphatic flow through the thoracic duct. Abnormal flow or pressure in the thoracic duct is thought to lead to exudation of chyle from the dilated lymphatic vessels. It is interesting that the pericardium in many of the animals was not grossly thickened. By removing the pericardium, we may be decreasing the right heart pressure thereby improving flow of chyle through the thoracic duct and into the cranial vena cava. Historically, I have had poor results using medical management (including Rutin, low fat diets, antibiotics, corticosteroids, and MCT oil) as well as surgical management (including thoracic duct ligation, passive drains, resections of portions of the diaphragm and active pleuroperitoneal pumps). As fate would have it, a Shiba Inu with idiopathic chylothorax presented to me one week following the ACVS symposium. The dog was requiring thoracocentesis every 3-4 days to remove the chyle from its chest. After a thoracic duct ligation and pericardectomy the dog

is free of any pleural effusion 6 months following surgery!

Another procedure that was discussed for the management of idiopathic chylothorax was thoracic duct ligation with cisterna chyli ablation and omentalization. In this procedure the cisternal chyli is isolated and disrupted. The omentum is sutured into the area to promote the formation of lymphatic-venous anastomoses, bypassing the thoracic duct.

Perianal Fisulae:

Admittedly, medical management of this condition has been around for several years, but I was discussing it with other surgeons at the ACVS symposium and we were all rejoicing in not having to operate many of these dogs. I have received a lot of calls from practitioners regarding my protocol for this condition. I will usually mention the use of corticosteroids in this condition but admit that I have not yet significantly helped a dog with perianal fistulae using corticosteroids. I have been very impressed with the efficacy of cyclosporine in helping this condition. The initial dose of cyclosporine is 3-7.5 mg / kg orally twice daily. I normally check a CBC and chemistry panel prior to initiating therapy. I generally recheck a trough level (12 hours after the most recent administration) of serum cyclosporine, a CBC and chemistry panel one week after initiating therapy and then every 2-4 weeks. A therapeutic level is generally taken as between 200 and 600 ng / ml. Therapy is continued for at least 2 months or 2 weeks beyond resolution of the fistulae. Assuming we are seeing a response, I generally start to wean them off of the cyclosporine over several months stopping at the lowest effective dose and ideally weaning them off completely. I generally recommend trying to get them onto a novel protein source diet. I generally do not use antibiotics or sulfasalazine initially. I do recommend clipping the perineum to monitor healing and allow for gentle cleaning of the area. Ketoconazole (5 mg / kg / day) may allow the dose of cyclosporine to be reduced more quickly. Dogs should be monitored for hair loss, hypertrichosis, gingival hyperplasia, vomiting, diarrhea, kidney and liver damage, cholestasis, cutaneous papillomatosis and viral and fungal infections, all of which are potential side effects of cyclosporine. Ketoconazole can also cause side effects such as pruritis, liver damage, cholestasis and vomiting. Recurrence rates may approach 50% after dogs are weaned off of the cyclosporine and may require reinstatement of the drug. Surgery may still be indicated in refractory cases (superficial or radical excision, cryotherapy, fulguration,

Spinal Fractures and Luxations

George Coronado DVM, MS

Dealing with spinal fractures of a pet can be a stressful situation not only for the owner but also for the attending clinician. Although some cases can seem hopeless, with proper management, a majority of these patients can become independent, ambulatory pets again.

The most common causes of spinal fractures and luxations are automobile accidents, falling from high places, or other severe external trauma. The same biomechanical forces that are responsible for appendicular bone fractures apply to spinal fractures (i.e. compression, rotation, bending). The direction and strength of these forces will dictate the type of spinal fracture or luxation that is produced. Because of the inherent stability of the thoracic spine, thoracolumbar fractures are most common. Other common sites are the lumbosacral and cervicothoracic spines. The reported incidence of the site of fractures in decreasing frequency is the lumbar (44.6%), thoracic (35.7%), and cervical (19.6%) spine.

The pathophysiology of spinal cord damage is similar to that of type I disc disease. Primary spinal cord injury occurs at the time of the trauma and results in crushing, concussive, and tearing injuries to the spinal cord. Damage to local blood vessels results in acute ischemia causing hypoxic injury to the spinal cord. Secondary spinal cord injury results from ongoing hypoxia and ischemia. The most important aspect of secondary spinal cord injury is the production of free oxygen radicals, which results in lipid peroxidation, further free radical production, and cell death. In the case of spinal fractures/luxations, ongoing instability of the spine results in continued primary injury to the spinal cord.

When presented with an animal with a history of severe trauma and acute paresis/plegia, it is important to immobilize the patient to prevent further trauma to the spine from possible instability. Immobilization can be accomplished by tying the patient to a "back board" or gurney. A backboard can be easily made with a sturdy length of plywood with holes cut in along the edges. The holes can be used to pull gauze through to tie the patient in a lateral position. After being immobilized the general status of the patient must first be attended to. Once the patient is stable, a thorough neurologic exam should be performed while the animal is in lateral recumbency. Cranial nerves, mental status, reflexes and sensory status can be evaluated in this position. It is important not to confuse a normal withdrawal reflex as the animal having pain sensation. A conscious response (i.e. trying to bite, crying, dilation of the pupils) must be observed in order to be confident that the animal has deep pain sensation.

Once the animal has been evaluated and the neurologic abnormality has been localized, spinal radiographs should be performed. Even if the neurologic deficits are localized to a specific site of the spine, complete spinal radiographs should be performed, as it is not unusual for more than one spinal fracture/luxation to be present. Lateral radiographs can be performed while the animal is tied to the backboard. Across the table ventrodorsal radiographs can be taken in most cases while the animal remains in a lateral position. Extreme care should be taken in moving anesthetized or sedated animals with spinal fractures. The paraspinal muscles are important in providing stability to spinal fractures in the awake patient. When the animal is under anesthesia, this muscle tone is lost, and the patient is prone to more instability of the spine. Advanced imaging (i.e. myelogram, CT scan) can also be helpful in evaluating compression of the spinal cord, especially if surgery is to be considered. The

severity of radiological abnormalities will not always correlate with severity of neurologic abnormalities. The amount of distraction of the vertebral bodies at the time of trauma may not be present on radiographs. Although the spine may be in close alignment on radiographs, a complete transection of the spinal cord may have occurred at the time of trauma. The site of the fracture can also help evaluate stability of the fracture. In general, fractures involving structures dorsal to the vertebral bodies (i.e. articular facets, lamina) are considered unstable, while fractures of only the vertebral bodies are relatively stable. Fractures involving both dorsal and ventral structures of a vertebra are the most unstable.

Once a diagnosis of a spinal fracture/luxation has been made, the next decision is the appropriate management. Although controversial, the use of corticosteroids has been shown to improve neurologic recovery in acute spinal cord trauma. Methylprednisolone has been the corticosteroid of choice because of its oxygen radical scavenger capabilities, which other corticosteroids lack. The use of dexamethasone has not been proven to offer a significant difference in neurologic recovery, and very commonly it will produce severe gastrointestinal side effects. Methylprednisolone given at 30 mg/kg, IV, within the first 8 hours of trauma offers the most benefits. Many protocols are offered after the initial bolus. I prefer a constant rate infusion of 5.4 mg/kg/hr IV. It can also be given at 15 mg/kg every 4 hours. The medication is generally discontinued at 24-36 hours of therapy. There is no proven benefit to continuing methylprednisolone after 24 hours, and there may be a risk of deterioration of clinical signs after 36 hours.

The use of surgical intervention usually depends on the animal's neurologic status, the type of fracture, and owner finances. Patients with no deep pain sensation generally have a very poor prognosis for a functional recovery due to severe trauma to the spinal cord. If the spinal cord is decompressed within the first 24 hours of injury the prognosis is not hopeless. In these cases, a myelogram or CT scan is useful to evaluate for evidence of myelomalacia. If myelomalacia is present there is no hope for recovery, and because of the probability of ascending disease, humane euthanasia is recommended.

Any case with pain sensation has at least a guarded to fair (if not good) prognosis for functional recovery if surgical intervention is performed soon after the trauma. The surgical goals are to stabilize the spine and decompress the spinal cord. There are many methods described for stabilizing the spine. The use of pins and methylmethacrylate is popular because of its versatility with many parts of the spine. There are many different opinions as to which case should go to surgery. If possible, any case of a spinal fracture/luxation with pain sensation should be stabilized to prevent future destabilization.

If owner finances limit surgical stabilization, conservative care is still an option. One study showed that there was no significant difference in functional recovery in dogs with spinal fractures with voluntary motor function managed with or without surgery, although the surgically managed cases recovered quicker. If possible, a fiberglass cast can be formed to the dorsal spine to offer added stability. Maintaining the bandage can be difficult for the advised 4-6 weeks. These patients should be strictly cage rested, and physical therapy should be performed multiple times daily. Bladder management is also a significant aspect of nursing care.

Continued on next page

Spinal Fractures and Luxations Continued

Every owner should be given a realistic expectation before surgical or conservative management. The long-term goal is a functional recovery. It is difficult to expect that a plegic patient will have completely normal activity with no ataxia after it has fully recovered. The better the neurologic function before management, the better the recovery. With proper management and with dedicated owners, most cases with at least pain sensation should eventually be able to walk and have a good quality of life.

The Cutting Edge...continued

tail amputation) and in cases with anal sac involvement (anal saccullectomy). The cost of the cyclosporine is high but comparable to surgery and hopefully will be lowered with the introduction of generic forms of the drug.

Perioperative Analgesia:

The emphasis here continues to be multimodal therapy – utilizing combinations of drugs with different actions to maximize the effectiveness of our analgesic treatments. This was comprehensively illustrated in Dr. William Muir's (The Ohio State University) lecture at a recent New Jersey VMA meeting on the use of combinations of morphine (3 ug/kg/min), lidocaine (50 ug/kg/min) and ketamine (10 ug/kg/min) added to the intravenous fluids administered to dogs and cats undergoing surgery. I have been very impressed with this combination in dogs undergoing painful surgeries (total ear canal ablations and major orthopaedic procedures). Discussion during this lecture included a review of the analgesic properties of ketamine (primarily as an NMDA antagonist effective for mild to moderate chronic pain and for analgesia during the postoperative period). It is interesting to consider that for years it was reported that ketamine had no analgesic properties. This resulted in litigation against veterinarians that performed procedures on animals restrained with drug combinations containing ketamine (although ketamine still does not provide the level of analgesia of a narcotic in situations of acute pain). The use of an intravenous lidocaine constant infusion (25 ug/kg/min) in dogs was also discussed by Dr. Karen Tobias (University of Tennessee) at the ACVS symposium. It was reported as being helpful in dogs undergoing gastrointestinal surgery as an analgesic and in its ability to increase tissue perfusion and GI motility. It also has

Dermatology Update

Congratulations!

Our dermatologist Dr. Tiffany Tapp (together with Dr. Virga!) had their first child, a baby girl, on May 24th.

This means Dr. Tapp will be out on maternity leave for 6-8 weeks. Her assistant Ashley will still be filling antigens and other prescriptions for current dermatology patients.

Other dermatologists in New England are:
Dr. Emily Rothstein (CT) (860) 620-9096
Dr. Laurie Stewart (MA) (978) 399-0100
Tufts Walpole clinic (508) 668-5454

Dr. Tapp will be back in clinics in July.

Thanks so much for your patience and understanding

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the benefit of reducing intraluminal fluid losses and albumin extravasation.

It is interesting to see continued interest in the use of local anesthetics in small animal medicine – something that has historically been utilized to a greater extent in the large animal arena. Dr. Stephen Greene (Washington State University) presented a session on Local Anesthetic Techniques for Small Animals at the ACVS symposium in San Diego. He discussed the benefits of pre-emptive analgesia and the role of local anesthetics in a multi-modal analgesic regime. He also reviewed local nerve blocks including those to block out each of the paws, those to block the entire forelimb and the dental nerve blocks. I found the review of the various techniques most helpful and it served as a reminder to include local anesthetics in my analgesic protocols. Our protocol for cruciate surgery continues to include the use of intra-articular bupivacaine (1/4 – 1/2 ml / kg of 0.5% bupivacaine) and / or epidural analgesics (morphine 0.1 mg/kg and bupivacaine 1.5 mg/kg). I am still in search of an answer as to why there is a delayed hair growth only at the site of the epidural injection in dogs following this procedure. I've heard many theories. I'll let you know what I learn in my quest. We will consider perioperative analgesia (including local anesthetic techniques) in a future continuing education seminar.

I hope that some of this helps. Please do not hesitate to contact me with any comments / questions / thoughts regarding any of the above and again if we can be of any assistance with any of your cases.

I hope to have the opportunity to meet everyone soon.

Radiology Film Interpretation

with

Sue Newell DVM, Diplomate of the American
College of Veterinary Radiology

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Staff Spotlight

Dr. David C. Sweet

Dave graduated from the University of Pennsylvania School of Veterinary Medicine and stayed there for his internship. He completed his surgical residency at the North Carolina State University College of Veterinary Medicine and then returned to the University of Pennsylvania as an Assistant Professor of surgery. Prior to joining Ocean State Veterinary Specialists he was in a large specialty referral center in northern New Jersey. Dave is a board certified surgeon with special interests in oncologic (including reconstructive), and cardiopulmonary surgery as well as perioperative analgesia. He is a finalist in the Publisher's Clearing House Sweepstakes. He likes good food, fast women and loose cars. He hates stuck up people.