ROCKY MOUNTAIN VETERINARY NEUROLOGY

Neurology/NeuroSurgery
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Companion Animal Spinal Surgery

Companion animal spinal surgery is a frequent and common veterinary neurosurgical procedure. The frequency of spinal cord-related injuries due to intervertebral disk extrusions (ruptured disks) and spinal trauma has resulted in the development of efficient, successful, and therapeutic surgical treatments. This has afforded companion animals with spinal conditions resulting in pain and compromised function a quality of life.

The decision for surgery and the surgical approach chosen will be dependent upon the disease process and location, and stability of the spine**.** ***The working theory of spinal surgery is to decompress or remove, and stabilize the spine when unstable.*** Approaches to the spine of companion animals are similar to that of humans; only the nomenclature differs based upon how the patients walk. A ***dorsal*** (from the top) and ***ventral*** (from the bottom or underside) and ***lateral*** (from the side) approach is often employed for spinal surgery in companion animals. Surgery of the neck region (***cervical vertebral column***), upper back (***thoracic vertebral column***) where the ribs attach to the vertebrae and lower back (***lumbar vertebral column***) located between the last rib and tailbone, and ***sacrum*** (tailbone) is common. All surgical procedures require exposing the spinal cord, which is housed within a bony canal (***vertebral canal***) of the vertebrae. Large muscles surround the vertebrae and add strength and support to the spine. These muscles must be moved to gain access or expose, the vertebrae. To expose the spinal cord, the bone of the vertebra must be removed with a high-speed drill and bone scissors called ***rongeurs***. Depending on the desired entry into the vertebral canal, various approaches have been developed. Removal of the roof of a vertebra (***dorsal laminectomy***), one side of the roof (***hemilaminectomy***) and joints (***facetecotmy***), or the creation of a window or slot from the underside or ventral aspect of the vertebra through the vertebral bodies and intervertebral disk space (***ventral slot***) may be utilized to gain access into the vertebral canal and expose the spinal cord. This allows the removal of pressures from compressing the spinal cord and tumors that may be growing around and within the spinal cord. Removing the nucleus pulposus (jell-O) of the intervertebral disc is often employed in dogs that have experienced an intervertebral disc extrusion, in addition to removing the ruptured nucleus and hematoma from the vertebral canal. This procedure is termed **fenestration** or **nucle-ectomy.** ***Performing this procedure is felt to lessen the chance for recurrent intervertebral disc extrusion by 85%.***

Following surgery, all patients are treated to provide the utmost pain control, ensuring a smooth recovery and outcome. Patients are maintained in a confined fashion to prevent excessive movement that could result in pain. To this end, visitation is discouraged for at least 24 hours following surgery. Analgesic or pain medications are given ***parenterally***, as injections or through the catheter your pet will have following surgery. Fentanyl, Oxymorphone, and Hydromorphone are very potent analgesics termed narcotics, utilized in managing post-operative pain. These agents are at least 8 times more potent than Morphine. All patients recovering from surgery receive continuous intravenous ***(CRFI)*** Fentanyl infusion (stream of medication through the intravenous catheter) during the first 24-48 hours. In addition to the CRFI, intermittent injections of Fentanyl, Oxymorphone and Hydromorphone as needed, to maintain constant pain relief during the post-operative period. In addition to the parenteral narcotic therapy, a Fentanyl Patch is placed on a clipped area of skin to allow for slow, sustained release of Fentanyl through the skin over a 72-hour period.

Most owners want to know when their pet will show neurologic improvement following spinal cord surgery. This is dependent upon the disease process, duration of the disease, and severity of spinal cord damage resulting in compression, hemorrhage and swelling (edema) within the spinal cord. Surgery will allow for the removal of any compression. The hemorrhage and swelling within the spinal cord also results in failure of nerve transmission, similar to standing on a water hose and blocking the of water within the hose. Surgery has corrected the cause for this, and allows for the body to begin to remove these mediators of inflammation within the spinal cord. ***As a general rule, functional improvement is expected as the spinal cord swelling and edema begins to resolve, usually beginning between day 3-5 following surgery.*** As the swelling and hemorrhage resolve, electrical impulses are able to pass the area of injury through the outer white matter highway system of the spinal cord. This is initially noted as movement to the tail and limbs, characterized by wagging of the tail, flexing of the paw and pulling the legs up when attempting to walk. With continued spinal cord recovery, the legs start to move with greater strength and your pet will attempt to push up on the legs only to wobble and fall. Walking in a drunk or ataxia fashion is followed by improved strength and balance. Gradual improvement over a 4-6 week is expected. Strength always improves faster than sensory function (wobbliness or ataxia). The recovery period is variable, but may occur over a 6-24 week period. ***Unlike human spinal surgery, successful surgery leaves companion animals pain free.***

Prior to surgery and at the time of admission, you will receive a surgical handout to prepare you for the return of your pet home following surgery. We ask you to read this handout and ask questions of our staff before your pet is discharged from our hospital. At the time of discharge of your pet, you will receive home care instructions in verbal and written formats. While exceptions occur, most patients can be left alone for up to 6-8 hours when they come home if restricted and with access to food and water, and protected from adverse environmental conditions. Surgical wound care is minimal. Topical medications and/or treatments along the incision line are not necessary in most circumstances. Prevention of contact with water, scratching and chewing of the incision, and sutures are necessary to allow for healing of the skin and underlying tissues. Sutures are to be removed 10-14 days following surgery. We provide this service at no cost. Following removal of the sutures, the use of topical sunscreens to prevent sunburn and ointments to allow for healing of the skin edges may be implemented. Discussion with the neurologist/neurosurgeon will allow for adequate preparation of your home and treatment of the surgical wound.

Following the early post-surgical period (10-14 days) activity levels are increased with gradual return to normal activity based upon the type of spinal surgery, degree of dysfunction and stage of the healing phase. More aggressive exercise levels may be implemented at that time to help with the recovery process. Walking on smooth surfaces with good footing, hydrotherapy in the form of swimming and water treadmill exercise, massage and acupuncture all have their place in maximizing the recovery of your pet following spinal cord surgery. Your neurologist will work with you in choosing and recommending the optimal recovery program for you pet.