



LIVS IN PLAIN VIEW



**Long Island
Veterinary Specialists**

*Where You Refer Your Patient First
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Diskospondylitis

How to prevent headaches from these back and neck aches

Neil S. Mittelman, DVM, DACVIM (LAIM), Neurology/Neurosurgery

From aardvarks to snow leopards diskospondylitis has been documented in a multitude of species. Diagnostic tools, underlying etiologies, and treatment modalities vary, but it is a condition easily missed if one does not remember to keep it on the differential list. A recent study sought to utilize serial measurement of the acute phase protein C-reactive protein (CRP) to aid in diagnosis and treatment of these infections of the cartilaginous vertebral endplates with secondary involvement of the intervertebral disk. Although this protein may be an adjunctive test to consider, a thorough review of this often-frustrating condition may also aid in early diagnosis and treatment.

Risk Factors

Diskospondylitis is not very common compared to other vertebral column maladies in dogs representing only 3.4% (181/5,497) dogs that underwent radiographs and computed tomography of the vertebral column. Medium to giant breed dogs are overrepresented with Labrador Retrievers often listed as the breed most likely to develop diskospondylitis. German Shepherds also seem to be overrepresented. Male dogs were nearly twice as likely as their female counterparts to have the condition. In that same large study, the average age of affected dogs was 5 years-old, but probability of diskospondylitis was 1.5x greater for dogs greater



than 10 years-old. Interestingly, the chance of diskospondylitis was much lower for young adult dogs 2-5 years old; however, various cases of puppies with this condition have been reported. Even in chondrodystrophic breeds, the chance of a less than 1-year-old dog having a naturally occurring Hansen Type I intervertebral disk herniation is rare. French Bulldogs have an average age of onset younger than even Dachshunds with 6% of French Bulldogs suffering from a disk herniation at 1 year. It is important to note; however, that French Bulldogs were nearly 3 times more susceptible to diskospondylitis than their small breed counterparts. Clinically, even in the presence of a breed known for vertebral malformation, meningitis, and propensity for disk herniation, diskospondylitis should remain on the differential list.

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Long Island Veterinary Specialists



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Neurology/Neurosurgery Department



**Patrick Roynard, DVM, MRCVS
DACVIM (Neurology/Neurosurgery)**

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- Neoplasia
- Neuromuscular diseases
- Stroke
- Traumatic spinal and head injury
- Wobbler's disease



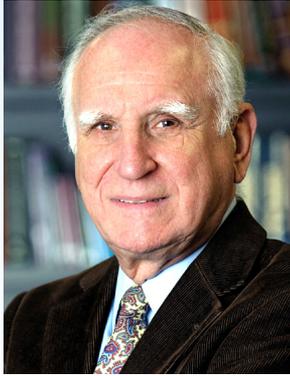
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- Radiography (X-Rays)
- Stereotactic Brain Biopsy (minimally invasive)

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To refer a patient:***

A NOTE FROM THE EDITOR



The “glad winter’s over” feeling is spreading on Long Island while COVID-19 is releasing its grip on every decision we make. Although we still need our masks, sanitizers, and distancing protocols to remain in effect for an uncertain while longer, we are happy to put our snow blowers away and look forward to warmer days and spring’s colors.

With a large percentage of the population getting one of the available COVID-19 vaccines, we should note that cats and dogs may eventually need their own COVID-19 vaccine to prevent the coronavirus from evolving further and “spilling” back to humans. SARS-CoV-2, the virus that causes COVID-19, is known to infect a number of animals besides humans, including cats, dogs, minks, tigers, and gorillas. However, at this time, scientists don’t think animals play a significant role in spreading the virus to people, and reports of COVID-19 in pets are rare, according to the Centers for Disease Control and Prevention (CDC).

Still, these animal “reservoirs” may pose a risk to humans down the road because there is the potential for the virus to evolve in those species and spread back to people. Although the U.S. Department of Agriculture (USDA) is not currently granting approvals for licenses for COVID-19 pet vaccines, companies are doing research on these vaccines ... but without a license, they can’t sell or distribute them. COVID-19 vaccines for

minks — which have caught the disease in large numbers on mink farms and spread it back to humans in some cases — are another story. The USDA is, however, accepting license applications for COVID vaccines for minks.

There is other news besides COVID-19. I’m happy to be back at LIVS assisting in THR’s as before, thanks to two doses of the Moderna version of the vaccine.

The Sun and April’s showers will surely encourage pollens, weeds, dust, and other allergens to add to the itchy, tearing, and wheezing sensations that cause discomfort to ourselves and our pets, and LIVS’s Dermatology Department has scheduled convenient hours so it may better offer its services to our clients and referring veterinarians.

Soon outdoor graduation ceremonies and parties will begin and grilling means our pets will be begging for bits of BBQ’d foods, most of which can cause intestinal upsets and summer seems to bring on more accidents, rashes, accidental ingestions, gastrointestinal disruptions with subsequent dehydration and injuries of many kinds. LIVS is open for any emergencies that may arise and our extended hours remain as before with each service ready to serve the needs of our clients and those patients who are referred to LIVS.

On another note, we’ve known for decades that pregnant women should not handle cat feces. There is an extreme risk of transmitting an illness called toxoplasmosis to the unborn baby. It’s a sickness that is caught from a causative agent found in cat waste. Recently, scientific investigation has found a connection between the *Toxoplasma gondii* parasite and brain cancer in humans. While the common belief is that the only way to get toxoplasmosis is through exposure to cat feces, this isn’t entirely true. The parasite can be

ingested by humans and animals by eating meat that has been contaminated with it if the meat is undercooked. *Toxoplasma* infection happens most often in venison, lamb, pork, and shellfish. Failure to wash one’s hands after handling contaminated meat or other items can also lead to infection. *Toxoplasma gondii* can contaminate water, can also be found in soil, on unwashed vegetables or fruits from a garden. Infected cats may also spread the parasite to other surfaces after using a litter box, then wandering through the house or sitting on furniture or other areas.

People with glioma, a type of brain cancer, are more likely to have been infected by the parasite. They compared the antibodies found in the people who developed cancer to a group of people who didn’t have cancer. *Toxoplasma gondii* emerged as an infection more common in people who had cancer.

The new study is the first to show clearly that the parasitic infection happened before the cancer developed, however an individual’s risk of developing brain cancer after an infection is very low.

No need to remind our community that dogs are faithful and helpful pets but a tale of such is always heartwarming...when a hiker slipped and broke his ankle in the remote foothills of the Italian Alps, his loyal canine companion refused to leave his side for seven days and nights in the freezing cold. The hiker credited the mixed-breed pup for saving his life. Immobilized, and without a cellphone signal, he was unable to call for help and they slept together for warmth till found by the Italian Alpine rescue crew.

Another item of interest, service dogs were found to be excellent companions to military veterans with both physical and psychological wounds. It was apparent that incorporating animal assisted therapy benefitted

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A NOTE FROM THE EDITOR

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vets recovering from PTSD. It appears that there is a biological component that suggests that when you look at your dog, talk to him/her in a high-pitched, positive way, when you pet your dog, brush or are involved in a loving and social way, you're releasing oxytocin which plays a crucial role in social bonding and brain function.

During the last few months, LIVS has continued to evolve in both its physical plant and the COVID-19 protocols to safely treat our patients while maintaining the specialized services of our hospital.

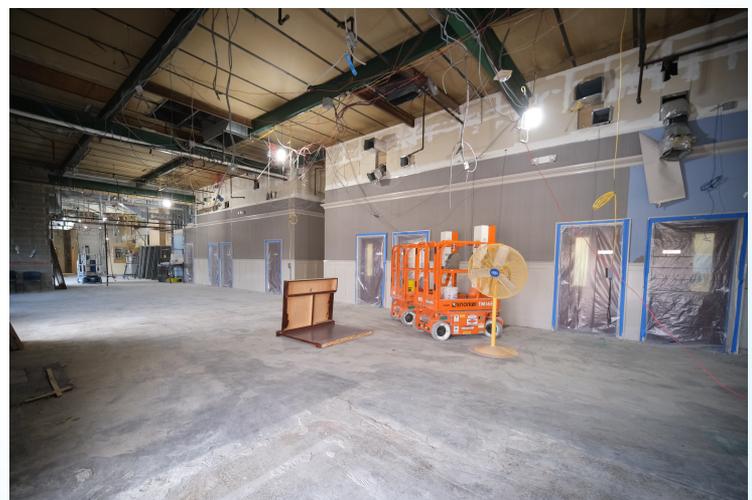
Here's a list of renovations and changes coming to LIVS:

- Additional exam rooms
- Indoor dog walking area
- Amphitheatre (for events post-COVID-19)

The attached photos show the changes made and those in progress.

All departments are fully staffed to serve our clients and patients all hours of every day. Consultations and appointments can be made by calling, (516) 501-1700. As before, we welcome all comments. Please submit them to Imarino@livs.org.

Leonard J. Marino, MD, FAAP, LVT



Diskospondylitis

Continued from Front Cover



Fig. 1 - Cervical diskospondylitis. Notice disk space collapse, sclerosis, lysis, and bridging spondylosis.

Infectious Agents

Diskospondylitis, most commonly results from a coagulase-positive *Staphylococcus* bacteria (e.g. *intermedius* or *aureus*). Other commonly reported bacteria in dogs include *Corynebacterium spp.*, *Escherichia coli*, *Streptococcus spp.*, *Pseudomonas spp.*, and *Proteus spp.*, but less common etiologic agents including *Salmonella*, methicillin-resistant *Staphylococcus aureus*, *Erysipelothrix*, *Nocardia*, and even fungi (ex. *Aspergillus*) occur. *Brucella* species are an important differential due to zoonotic potential. Although *Brucella canis* is the one most talked about in the United States canine diskospondylitis due to *Brucella suis* is well documented in Australia and in other countries where feral pig hunting is common and where raw pig may be fed to dogs. Having familiarity with these infectious organisms is paramount in a condition where attempts at culture may prove unrewarding.

Disease Process

There are three main proposed mechanisms, in which infectious organisms may obtain access to the disk space and vertebrae. Even though the source of infection is not always identified hematogenous spread is considered the most common mechanism with infection of the urinary tract, prostate, endocardium, and sites of dental extraction often implicated. In the case of urinary tract infections, it may be possible that retrograde blood flow through vertebral sinuses may result in spread of infection. Generalized skin infection is also a potential source of infection that should not be ignored when sources of diskospondylitis are considered.

Foreign body migration is also possible. Although I have treated several dogs with a bad habit of wood chewing that resulted in oral and lingual abscessation, grass awn migration is a more common cause of diskospondylitis. Muscular

contractions may assist the awn in reaching the vertebral structures after piercing the skin or swallowing the awn may allow for migration into the bowel and along the mesenteric root before reaching the vertebrae. Inhaling the awn with lung penetration and migration along the diaphragmatic crura may explain why grass awn-associated diskospondylitis tends to occur at second through fourth lumbar vertebrae where the crura insert.

Iatrogenic infection may result after paravertebral injection or even after spinal surgery. Fortunately, this remains the least likely mechanism, with less than 1-2.2% of dogs reported developing post-operative diskospondylitis following surgery including spinal decompressive surgery. These statistics are similar to those seen in human spinal surgery where incidence of post-operative diskospondylitis is between 0.1-3% depending on the type of surgical procedure and anatomic site of surgery.

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Diskospondylitis

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Fig. 2 - Thoracic diskospondylitis. T5-6, T6-7 lysis, and sclerosis of the endplates with disk space narrowing.

Clinical Signs

Clinical signs are highly variable but may include discomfort on spinal palpation, fever, lethargy, anorexia, and signs consistent with myelopathy including ataxia and paresis or even gait change initially attributed to lameness (ex. short-strided pelvic limb gait). Spinal hyperpathia is often listed as the most common sign of diskospondylitis, but some studies have found it to be absent in 87% of cases. Onset of discomfort is also variable with both peracute histories as well as others, which have clinical signs that may wax and wane for even weeks or months before a diagnosis is eventually made. Fever is present in as few as 1/3 of cases. Although it has been found more commonly in the thoracolumbar region than the cervical region, the lumbosacral junction is the most common site of infection in both dogs and cats.

Imaging

Classical radiographic findings include collapse of the intervertebral disk space with or without end

plate erosion. Sclerosis and ventral bone spurs appear later in chronic infections. Bony lysis precedes new bone formation, and more advanced lesions demonstrate bone lysis, new bone formation, central destructive focus, and osteophytes that bridge the adjacent vertebrae (Fig.1 and 2). Osteomyelitis is generally found ventrally affecting the vertebral body and disks but can extend to dorsal element. Vertebral bodies may shorten, a common finding in the rare condition of feline diskospondylitis.

The findings in those cases of juvenile dogs less than 6 months have significantly different early appearance with narrowing of the disk space with or without subluxation of adjacent vertebrae initially or within 2 weeks in approximately 1/3 of cases. Vertebral end plate lysis was not an initial radiographic finding but was evident on follow-up radiographs at 3 weeks. When healing after appropriate treatment six weeks later, the young dog radiographs had more bridging and sclerosis than vertebral lysis. In stark contrast, the older dogs showed increased bony lysis with no additional

sclerosis or bridging at 3 weeks, and radiographic improvement was not noticed until 6-12 weeks following initiation of therapy.

CT and MRI characteristics of diskospondylitis are beyond this scope of this review; however, the two latter modalities are much more sensitive in detection than radiographs. Even when signs are first noticed, radiographic appearance consistent with diskospondylitis may lag up to 6 weeks and may be confused with healing or degenerative lesions. In the recent paper utilizing CRP only 20% of radiographs from primary clinicians showed radiographic evidence of diskospondylitis, where MRI allowed for accurate diagnosis in all cases. Radiographs have been utilized commonly due to ease of access and relatively low cost. Serial monitoring every 4-8 weeks is recommended to follow progress after initiation of therapy. In some cases, CT or MRI may be performed when cessation of treatment is considered.

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Diskospondylitis

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Clinicopathology Diagnostics

C-reactive protein is now the most heavily researched acute phase protein in both human and canine neurologic disease. Serum CRP concentration is not elevated in dogs with intervertebral disk protrusion or degenerative lumbosacral stenosis. CRP has been shown to have utility in diagnosing and managing Steroid Responsive Meningitis-Arteritis, so imaging is still necessary in addition to serum testing to make a potential diagnosis. Serum indicators of inflammation including leukocytosis, neutrophilia, and hyperglobulinemia are not consistently present in diskospondylitis. Rate of positive blood cultures range from 33.9-82%. Rate of urine culture range from 25-45%. Both fluoroscopic and CT-guided aspiration of the infected disk has also been reported with a higher success rate in some cases. Brucella testing is warranted in all cases of suspected diskospondylitis due to its zoonotic potential. Galactomannan EIA testing on serum

and/or urine is recommended where systemic Aspergillosis is suspected including in German Shepherds where immunodeficiency may predispose to this affliction.

Treatment

Ideally medical treatment of diskospondylitis is guided by culture and antimicrobial sensitivity. First generation cephalosporins or beta-lactamase-resistant penicillin's are often effective. If paralyzed, intravenous antimicrobials are strongly recommended for 5-7 days or longer if no improvement occurs and expanded to include anaerobic coverage. If patients have severe generalized skin disease topical therapy is often advisable as well. A short course of a non-steroidal anti-inflammatory with a more prolonged course of gabapentin and/or amantadine may also be helpful to maintain comfort during the recovery process.

Take Home Message

When possible MRI should be considered for patients with spinal pain, neurological signs or both, especially in those cases with elevated CRP and no other systemic illness; however, a diagnosis of diskospondylitis and treatment plan may be made by a combination of clinical examination, hematological/urinary testing, as well as radiographic testing.



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Canine Megaesophagus

Joshua W. Tumulty, DVM, DACVIM (Internal Medicine)
Internal Medicine, Radioiodine Therapy (I-131)



Idiopathic megaesophagus is the most common cause of regurgitation in the dog. The disorder is characterized by esophageal hypomotility and dilation, progressive regurgitation and loss of body condition. Several forms of the syndrome have been described, including congenital idiopathic, acquired secondary, and acquired idiopathic megaesophagus.

Congenital idiopathic megaesophagus is a generalized hypomotility and dilation of the esophagus causing regurgitation and failure to thrive in puppies shortly after weaning. An increased breed incidence has been reported in the Irish setter, Great Dane, German shepherd, Labrador retriever, Chinese Shar-Pei, and Newfoundland breeds, and autosomal dominant inheritance has been demonstrated in the Miniature Schnauzer and Fox terrier breeds. The pathogenesis of the congenital form is incompletely understood, although several studies have pointed to a defect in the vagal afferent innervation of the esophagus. The congenital form of the disease may be due to a delay in maturation of the esophageal neuromuscular system, a theory that explains why young dogs may improve with careful feeding management.

Acquired secondary megaesophagus may develop in association with a number of other conditions. Myasthenia gravis accounts for 25–30% of the

secondary cases. In some cases of myasthenia gravis, regurgitation and weight loss may be the only presenting signs of the disease, whereas in most other cases of acquired secondary megaesophagus, regurgitation is but one of many clinical signs including peripheral muscle weakness. Acquired secondary megaesophagus has also been associated with hypoadrenocorticism, lead poisoning, lupus myositis, and severe forms of esophagitis. Hypothyroidism has been suggested as a secondary cause of idiopathic megaesophagus but retrospective risk factor analysis has not identified it as an important cause. Many obstructive esophageal diseases (neoplasia, granuloma, vascular ring anomaly, stricture, periesophageal masses and foreign bodies) can also lead to megaesophagus if they are of sufficiently chronic duration.

Most cases of adult-onset megaesophagus have no known etiology and are referred to as acquired idiopathic megaesophagus. The syndrome occurs spontaneously in adult dogs between 7 to 15 years of age without sex or breed predilection. The disorder has been compared erroneously to esophageal achalasia in humans. Achalasia is a failure of relaxation of the lower esophageal sphincter and ineffective peristalsis of the esophageal body. A similar disorder has never been rigorously documented in the dog. Several important differences between idiopathic megaesophagus in the dog and achalasia in humans have been documented. Although the etiology(ies) has not been identified, some studies have suggested a defect in the afferent neural response to esophageal distension similar to what has been reported in congenital megaesophagus.

Assessment of dogs with signs and symptoms of feeding and/or swallowing disorders encompass multiple dimensions that include, but may not be limited to: a) review of the signalment; b) review of drug history and history of recent anesthesia; c)

physical examination (prefeeding assessment); d) clinical feeding and swallowing evaluation; and e) instrumental evaluation of swallowing. It is essential that the clinician make a clear differentiation between regurgitation and vomiting at the outset. Failure to recognize the difference between regurgitation and vomiting often leads to inappropriate testing (i.e., tests most useful for diagnosis of abdominal disorders are generally performed), misdiagnosis, and the use of ineffective treatment protocols. Therefore, the first diagnostic step is to obtain an accurate history. This is best accomplished by a clinician who maintains a high index of suspicion regarding the possible occurrence of regurgitation and who subsequently asks clear questions of the client about their pet's clinical signs. Physical examination of the animal must include careful examination of the pharynx using sedation or anesthesia if necessary. The pharynx and neck should be carefully palpated for masses, asymmetry, or pain. The chest should be carefully auscultated for evidence of aspiration pneumonia. Evaluation of cranial nerves should be performed including assessment of tongue and jaw tone, and abduction of the arytenoid cartilages with inspiration. Complete physical and neurological examination may identify clinical signs supportive of a generalized neuromuscular disorder, including muscle atrophy, stiffness, or decreased/absent spinal reflexes. Contrary to popular belief, the presence or absence of a gag reflex does not correlate with the efficacy of the pharyngeal swallow nor adequacy of deglutitive airway protection.

Thoracic radiography for survey evaluation of the esophagus is the most important screening procedure in the diagnosis of a regurgitation disorder

Figure 1. Radiographs are evaluated for evidence of esophageal dilation and the presence of a foreign body or thoracic mass. Remember that

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Canine Megaesophagus

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Fig. 1 - Lateral thoracic radiograph demonstrating diffuse, severe esophageal dilatation and alveolar infiltrate within the cranial-ventral lung lobe indicative of aspiration pneumonia.

transient dilation may occasionally occur and can be related to aerophagia, anxiety, dyspnea, anesthesia, and vomiting. Knowledge of the history is important in differentiation of potentially transient causes from those that are more long-standing. If survey radiographs fail to provide a definitive diagnosis, a barium esophagram (with videofluoroscopy if available) should be performed.

Figure 2. A liquid barium suspension (10 to 20 ml prior to each exposure) is best employed in evaluating for the presence of esophageal dilatation. A mixture of food and barium is superior for evaluating esophageal motility because in some patients with slightly to moderately decreased contractility, peristalsis may be adequate for liquid but clearly unable to propel solids aborally in a normal manner. Contrast videofluoroscopy

involves real time image capture of the dog as it is swallowing liquid barium or barium-soaked kibble. Videofluoroscopy is used to determine the normal sequence of events that make up a swallow and to measure the timing of these events in relation to one another. For purposes of the radiographic examination of swallowing, it must be remembered that videofluoroscopy captures only a brief window in time and it does not simulate a real meal. Videofluoroscopy is essential for the diagnosis of functional esophageal disorders (esophageal dysmotility) not associated with esophageal dilation and has some prognostic value in megaesophagus via assessment of the severity of peristaltic dysfunction.

A baseline CBC and biochemical profile should be run in all patients with megaesophagus to look for evidence of underlying problems. Specific tests to evaluate for systemic disorders such as hypoadrenocorticism (ACTH stimulation), systemic lupus erythematosus (antinuclear antibody), and serum lead levels are done if the history and/or physical examination indicate that these primary

disorders may exist. Myasthenia gravis should be considered in any patient with megaesophagus. The test of choice is an acetylcholine receptor antibody titer. It is important to recognize that some dogs with focal myasthenia gravis manifested with diffuse megaesophagus diagnosed on thoracic radiographs can have a normal acetylcholine receptor antibody test at initial testing, and have an abnormal (positive) acetylcholine receptor antibody test when repeated 2–3 months later. Repeat acetylcholine receptor antibody testing is important in dogs, as many dogs with atypical focal myasthenia gravis have been misdiagnosed with idiopathic megaesophagus on the basis of a single normal acetylcholine receptor antibody test.

Additional diagnostic procedures that can be performed based on the animal's signalment, history, and neurological examination, include an EMG, nerve conduction velocities, and muscle biopsies. Esophagoscopy is less reliable than radiography and fluoroscopy, although it can be used to rule out underlying causes of megaesophagus such as esophagitis, neoplasia,



Fig. 2 - Lateral thoracic barium swallow demonstrating diffuse esophageal dilatation and hypomotility.

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Canine Megaesophagus

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and radiolucent foreign bodies.

Medical management of generalized megaesophagus involves modification of feeding practices. Treatment of the underlying cause (secondary megaesophagus) is of paramount importance. In most cases, idiopathic megaesophagus is incurable, and treatment involves an individually tailored feeding regimen with the patient eating in an elevated position. Megaesophagus patients are ideally fed 2 to 4 times daily. I have had the best success feeding soft moist to solid (chopped) canned food consistency. I only recommend trying gruels if the

consistency is not well tolerated. Some patients do well when fed a series of "meatballs" fashioned from canned food. Others can tolerate dry food fairly well. A key point is that each patient is an individual and clients should be instructed to experiment with various food consistencies in order to determine the best approach for their own pet. Feeding from an elevated position allows gravity to help move the meal into the stomach. If possible the animal should be held in a vertical position for 5–10 minutes after eating. Since the esophagus is virtually never completely empty in a megaesophagus patient it is often helpful to hold the animal in an elevated position for 5 to 10 minutes at a time sometime between meals and at bedtime, in an effort to empty the esophagus as much as possible prior to an expected period of prolonged recumbency. The use of specialized feeding chairs ("Bailey Chair") have been utilized with success by positioning the dog in a totally upright ("begging") position to eat, drink, or take medication, allowing gravity to aid in transit of anything ingested to the stomach.

Figure 3. Instructions for constructing a feeding chair may be found on the Internet. Recent investigation of the use of sildenafil in the treatment of puppies with congenital megaesophagus revealed treatment successfully

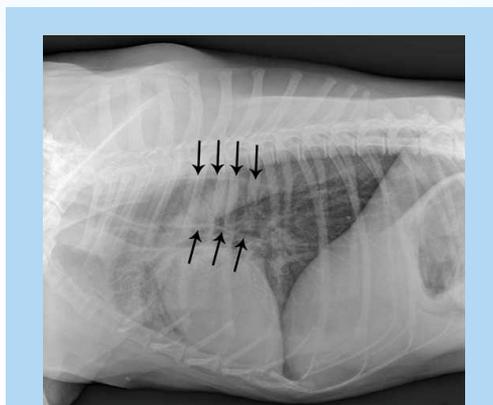


Fig. 3 - Canine "Bailey Chair"; patient is maintained in an upright position utilizing gravity for assisted feeding.

reduced the number of regurgitation episodes and improved weight gain. Sildenafil also reduced basal tone and increased electrically induced relaxation of the lower esophageal sphincter (in vitro) in a dose-dependent manner, thus, suggesting that sildenafil may be useful as an alternative treatment for controlling signs related to congenital megaesophagus. The dosage utilized was 1mg/kg orally every 12 hours.

An option in cases where frequent regurgitation remains an ongoing problem with or without aspiration events is to place a gastric feeding tube (e.g., percutaneous endoscopy-guided gastrostomy tube [PEG])

Figure 4. All food and water can then be administered through the feeding tube (I have managed some patients successfully for greater than 5 years in this way). Periodic tube replacement will be necessary. Low profile feeding tubes often work best for long term tube feeding. This method of management has been highly successful for some dogs that continue to regurgitate frequently despite excellent efforts to manage them with an elevated feeding program.

The prognosis for dogs with megaesophagus is variable depending upon the underlying etiology, the degree of dysfunction and the systemic status of the dog. The long-term prognosis is poor in most cases, although some cases can be managed successfully for years. The prognosis is improved if treatment of an underlying disease is possible. Many patients with idiopathic megaesophagus can be managed successfully for months to years. I have known many dedicated owners who have managed to find the time required to care for their pets. As a result of this experience I try to offer as much encouragement as possible at the time of diagnosis. Owners can be directed to support groups for owners of dogs that have, had or may have megaesophagus. Members of the group can provide suggestions and ideas for feeding and care of dogs with megaesophagus. The most worrisome complications that can occur are aspiration pneumonia and significant weight loss. The prognosis is guarded to poor in patients that suffer recurrent episodes of pneumonia.



Fig. 4 - Percutaneous gastrostomy tube allowing for consistent feeding and medication administration.



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HYBRID THR



CEMENTLESS THR

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Dr. Dominic J. Marino is one of the most experienced hip replacement surgeons in the country. He has performed over 2,000 THR procedures, starting in the early nineties. His areas of special interest include joint replacement surgery, brain surgery, and spine surgery. Dr. Marino has lectured nationally and internationally on these subjects.

To learn more about Total Hip Replacement procedures and other Hip Dysplasia treatment options, or to refer a case:

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