



Education Newsletter



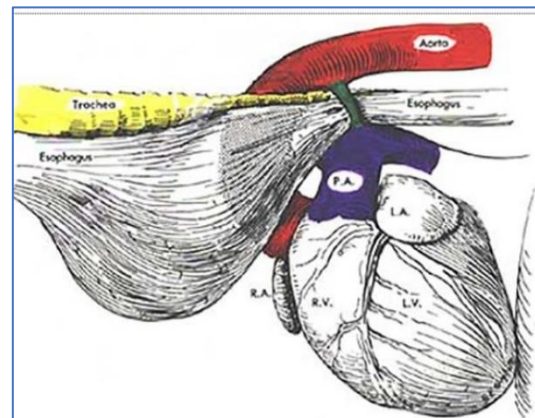
2021 Edition 3, December 3, 2021, BARRC Education Committee

This edition of the BARRC Education Newsletter covers one topic only because it is something that has struck me this year and I think about what a horrible malady it is all the time: megaesophagus. For those of you who don't know, I had my second litter of Ridgeback puppies in early August. There were only 3 puppies and at 4.5 weeks of age one of them, "Tinkerbelle", was diagnosed with megaesophagus. Just weeks before, a close friend also had a megaesophagus puppy. Both were euthanized. With this article comes the hope that Viagra will help pups like Tinkerbelle in the near future. Wendy Peirce, Editor and Chair, Education Committee

Megaesophagus in Puppies and Viagra

One of the most devastating experiences as a breeder is to lose one or more puppies in a litter to megaesophagus. Megaesophagus is a disorder in which the esophagus (the tube that carries food and liquid between the mouth and stomach) dilates and loses motility. The combination of the enlarged esophagus and its inability to move food into the stomach generally results in the puppy regurgitating whatever it has eaten, sometimes aspirating the food into the pup's lungs. The puppy rapidly loses weight and often pneumonia ensues. Typically, the prognosis for megaesophagus puppies is guarded to poor with the median survival time of 90 days, far less if pneumonia is contracted.

Megaesophagus is a term used commonly to describe two variations in puppies and an acquired adult-onset disorder. It is an idiopathic disorder, meaning that it is a condition which arises spontaneously or for which the cause is unknown. Research on adult-onset acquired idiopathic megaesophagus (AIME) in dogs suggests that it can be initiated by a variety of things including certain combinations of ingredients and/or the physical characteristics of some processed food, pesticide poisoning, hypothyroidism, a vegetarian diet or, more commonly, damage between the nerves and muscles of the esophagus (e.g., myasthenia gravis). In puppies, megaesophagus can be caused by the abnormal development of blood vessels in utero. This "vascular ring anomaly" occurs when a congenital abnormality of the heart's blood vessels, generally a persistent right aortic arch, results in the esophagus being compressed at the level of the base of the heart. When caught early enough, surgery can be performed on the puppy to



MSPCA-Angell: Drawing of vascular ring anomaly. The green colored structure is the vascular ring anomaly, (specifically a persistent right aortic arch, causing entrapment and constriction of the esophagus).

Continued on page 2



Education Newsletter, continued

2021 Edition 3, December 3, 2021

correct the anomaly. The other form of congenital idiopathic megaesophagus (IME) in puppies has no definitive cause, although there is evidence that it may be an inherited condition. The rest of this article will focus on IME.

It is believed that there is a genetic basis for IME. The dog breeds more prone to megaesophagus include: Chinese Shar-Peis, Fox Terriers, German Shepherds, Great Danes, Greyhounds, Irish Setters, Labrador Retrievers, Miniature Schnauzers, Newfoundlands, and our beloved Rhodesian Ridgebacks. In Fox Terriers, it has been shown that IME is an autosomal recessive trait and autosomal dominant in the Miniature Schnauzer. Clemson University has found a significant association between the megaesophagus phenotype in German Shepherd Dogs and a region of chromosome 12 in the dog. The exact gene has not been identified. The mode of inheritance has not been determined for other breeds that are predisposed to this condition but a similar genetic component should be assumed. Because of this, it is imperative that breeders be open and forthcoming about any incidents of IME in offspring their dogs have produced.

IME usually presents itself with regurgitation at about the time puppies are being weaned, The puppy isn't vomiting. There is no retching or effort; the food – whether it be mother's milk or puppy food – just comes up. The esophagus has no ability to move the food down into the stomach and gravity takes over. This can rapidly progress to pneumonia as the puppy aspirates the regurgitated food unless there is human intervention. Depending on the severity of the IME, it can be a situation where the puppy should be euthanized – and roughly 80% fall into this category – or, if the IME is not severe, there are things that can be done to support the puppy.

To determine if the puppy has IME, a barium swallow x-ray should be taken. The barium clearly highlights the esophagus as shown by the following two pictures. The pictures are x-rays of two 4.5 week old Rhodesian Ridgeback littermates. The x-ray on the left shows a normal esophagus where most of the barium has rapidly been moved through the esophagus. The x-ray on the right shows a puppy with IME.



Normal esophagus of a 4.5 week old Rhodesian Ridgeback



4.5 week old Rhodesian Ridgeback with megaesophagus

Continued on page 3



Education Newsletter, continued

2021 Edition 3, December 3, 2021

Treatment and Management of Megaesophagus

While the puppy with IME in the x-ray was euthanized, IME is not always a death sentence. There are cases that are not as severe and there are treatments and management approaches that may help in these cases. Some puppies with congenital megaesophagus may outgrow the condition. One of our Bay Area Rhodesian Ridgeback Club members has successfully raised an IME puppy through the use of a “Bailey Chair” feeding approach. Invented by Joe and Donna Koch for their own dog named Bailey, a Bailey Chair keeps the dog upright while they drink and eat, which allows the food and water to get into the stomach by way of gravity.



Courtesy: Bailey Chairs 4 Dogs

Other treatments that have been used to treat megaesophagus are more invasive. For the purpose of controlling regurgitation, an esophagostomy tube can be placed for draining the esophageal fluid and an esophagogastric tube can be placed for nutritional support. This approach is more commonly used in mature dogs rather than puppies.

Although many of the following treatments are either in the research stage or anecdotally effective, they are worth mentioning. Alternative therapies, including traditional Chinese Veterinary Medicine (TCVM), are increasingly being used to stimulate the esophagus to move more effectively, either as a sole therapy in mild cases or as an adjunct to Western therapeutic management.

In a study done by the University of Missouri, College of Veterinary Medicine in collaboration with the School of Medicine, they discovered a breakthrough treatment for a subpopulation of dogs with megaesophagus. Although difficult to diagnose, they developed a technique for diagnosis, and identified a defect of the lower esophageal sphincter (LES) as the cause of megaesophagus in a number of dogs examined. The LES acts as a valve between the esophagus and the stomach, opening when food and water are swallowed, then clamping tight so food doesn't come back from the stomach into the esophagus. In dogs afflicted with megaesophagus caused by this achalasia-like syndrome (a condition in which the muscles of the lower part of the esophagus fail to relax), the LES remains closed. Adapting testing procedures used on humans, they were able to identify closed LES in the dogs they were studying. Using treatments also originally developed for humans, they then performed an endoscopy to first dilate the LES and then they administered Botox, which paralyzes the sphincter muscles that formerly wanted to remain closed. While this procedure is still being studied, they have had dogs with remarkable clinical improvement. The patients that show improvement though this temporary opening of the sphincter can be candidates for surgery, and that surgery is potentially curative.

Alternative therapies:

- Acupuncture with Herbal Medicines: In traditional Chinese Veterinary Medicine (TCVM), megaesophagus is considered a Qi Deficiency (loosely translated as a “lack of energy”). Chinese herbal medicine, as a component of TCVM is used to treat Qi deficiency. Chinese herbal formulas such as Four Gentlemen and/or Happy Eartha for rebellious stomach Qi (regurgitation) in combination with acupuncture has been used successfully to treat megaesophagus.

Continued on page 4

- Low-level laser therapy (LLLT) is photobiostimulation therapy that uses the emission of red and near infrared light wavelengths. Although not used on IME in puppies, it has been used on older dogs with megaesophagus on an on-going basis with some success.
- Homeopathic: Homeopathic medicine has no formal experimental studies on efficacy associated with treatment of megaesophagus, however, anecdotal clinical evidence shows good results from treatment with homeopathic medicine that matches the individual adult animal's clinical signs.

Viagra (Sildenafil)

After reading the title of this article, I'll bet you wondered when we would get to Viagra and how it relates to megaesophagus. Sildenafil, the generic name for Viagra, is being used more and more to treat dogs with both AIME and IME forms of megaesophagus, as well as for pulmonary hypertension. Although not a mainstream treatment, there has been significant research in the efficacy of this drug for treatment of IME.

In 2017, the Italian University of Parma conducted a controlled study of 21 congenital IME diagnosed puppies, where treatment with sildenafil was shown to rapidly improve the condition of the puppies. Puppies treated with sildenafil had half the number of regurgitation episodes as the control group. Additionally, sildenafil-treated dogs gained significantly more weight and the relative esophageal diameter was significantly lower compared to the puppies in the control group. Although the congenital IME puppies treated with sildenafil still required feeding from an elevated position, the study concluded that they could benefit greatly from the easier esophageal emptying and the decrease in esophageal dilatation, resulting in an improvement in clinical signs and general health status. Fortunately, all the enrolled puppies fully recovered after the end of the clinical trial and no longer needed any further treatment. Thirty days after the conclusion of the trial those in the sildenafil group had only sporadic regurgitation episodes, and after two to three months, they were completely healthy.



Since the above referenced study was published, veterinarians world-wide have begun to experiment with sildenafil as a treatment for IME. There are a number of anecdotal blogs and other social media items about the successful use of sildenafil for megaesophagus in both dogs and cats. And there are specific cases documented by veterinarians such as a 2020 Taiwan Veterinary Journal paper that describes the treatment of a four-month-old puppy diagnosed with IME. At first, he was symptomatically treated including medication for pneumonia, feeding through a percutaneous endoscopic gastrostomy (PEG) tube with an upright feeding position, but regurgitation persisted. Sildenafil was then administered for two weeks and regurgitation stopped one day later. Sildenafil was then tapered to half dose for another two weeks. During following-up x-rays 10 days after sildenafil administration, the degree of esophagus dilation significantly reduced. The clinical signs of IME were completely resolved without relapse for more than the 300 days the dog was monitored. Sildenafil was reported having inhibitory effect of canine gastric contraction without affecting gastric emptying time.

Washington State University has recently concluded a study on the use of sildenafil for the treatment of megaesophagus but the research has not been published as of the writing of this article.



Education Newsletter, continued

2021 Edition 3, December 3, 2021

Sildenafil, with its ability to relax and dilate blood vessels, helps to open the sphincter between the stomach and esophagus. It facilitates getting food out of the esophagus and into the stomach. Like many drugs in veterinary medicine, sildenafil is not FDA sanctioned for use in animals and isn't available from a veterinary pharmaceutical manufacturer. You may have to get it from a compounding pharmacy with a veterinarian's prescription. The good news is that it is not expensive and, from the reports available, giving it may have significant benefits to an IME puppy.

Megaesophagus, especially IME in puppies, can be difficult to treat. Unfortunately, with or without treatment, most pets with megaesophagus currently have a poor prognosis. The potential for complications is quite high. Malnutrition and aspiration pneumonia are the leading causes of death. Recently the use of sildenafil has shown to have a positive affect and we are seeing better outcomes in IME puppies treated with this drug. Long-term studies and prognosis have not yet been performed to date but results seem promising compared to older treatments. The use of sildenafil in treatment will, hopefully, have sufficient efficacy and availability to turn that IME 80% fatality statistic around.

For more information on megaesophagus specific to Rhodesian Ridgebacks, please see the Rhodesian Ridgeback Club of the United States, Health and Genetics article written by Cynthia McFadden: [What Breeders Need to Know About Megaesophagus](#). It is a bit dated now, but still a good reference article.

REFERENCES

1. Karyl J. Hurley DVM, Caroline Mansfield BSC, BVMS, PhD, Ilze Matīse VanHoutan DVM, PhD, Lauren Lacorcchia BVSC, MVSC, Karin Allenspach Dr Med Vet, PhD, Geoffrey Hebbard B Med Sci, MBBS, PhD, Stanley L. Marks BVSC, PhD, Robert Poppenga DVM, PhD, James H. Kaufman PhD, Bart C. Weimer PhD, Kevin D. Woolard DVM, PhD, Joe Bielitzki DVM, MS, Derek Lulham BSC, and Jerome Naar PhD, A comparative analysis of two unrelated outbreaks in Latvia and Australia of acquired idiopathic megaesophagus in dogs fed two brands of commercial dry dog foods: 398 cases (2014–2018), Journal of the American Veterinary Medical Association, Volume 259: Issue 2, July 15 2021
2. Karlapudi Satish Kumar and Devarakonda Srikala, Hypothyroid associated megaesophagus in dogs: four years (2009-2013) study in Hyderabad, India, Journal of Advanced Veterinary and Animal Research, Volume 2: Issue:2, June 2015
3. Jordanna Fetto, VMD, Understanding vascular ring anomaly, MSPCA-Angell
4. Dr Edward Bassingthwaight, Congenital megaesophagus in dogs, Dogs Naturally, November 6, 2021
5. Megasophagus, Canine Inherited Disorders Database, University of Prince Edward Island, 2011
6. Collaboration between College of Veterinary Medicine and the School of Medicine Develops Revolutionary Treatment for Canine Megaesophagus, University of Missouri, School of Veterinary Medicine
7. Yuka KANEMOTO, Kenjiro FUKUSHIMA, Hideyuki KANEMOTO, Koichi OHNO and Hajime TSUJIMOTO, Long-term management of a dog with idiopathic megaesophagus and recurrent aspiration pneumonia by use of an indwelling esophagostomy tube for suction of esophageal content and esophagogastric tube feeding, The Journal of Veterinary Medical Science, November 17 2016
8. Judith E. Saik, DVM, DACVP, CVA, CVCH, CVFT, Integrative approaches to megaesophagus, Innovative Veterinary Care, October 2, 2018
9. F. Quintavalla, A. Menozzi, C. Pozzoli, E. Poli, P. Donati, D. K. Wyler, P. Serventi and S. Bertini, Sildenafil improves clinical signs and radiographic features in dogs with congenital idiopathic megaesophagus: a randomised controlled trial, National Library of Medicine, Veterinary Record, May 2017
10. Yi-Ju Tu, Cheng-Shu Chung and Lee-Shuan Lin, Using sildenafil to treat a dog with idiopathic megaesophagus, Taiwan Veterinary Journal, Vol. 46, No. 01, 2020