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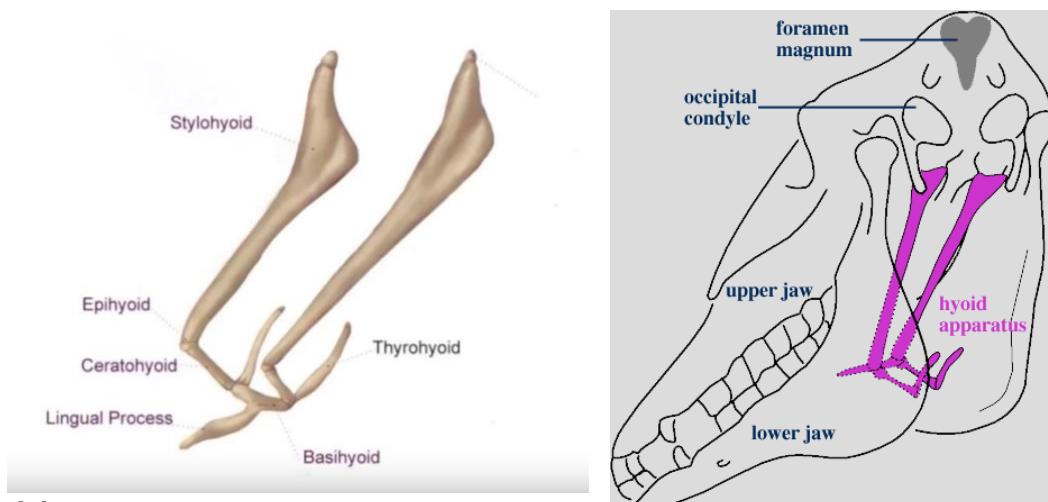
DVM Candidate 2027

My passion has always been working with horses. I'm a third-generation horse woman and barrel racer. When I started competing at a professional level in barrel racing I became interested in performance horse medicine. After working as an LVT for almost 20 years in a small animal clinic in my hometown I decided to pursue my dream of vet school. I am currently in my first year at Tufts and am so thankful for the wonderful care and education they provided me with throughout my recent experience with my talented gelding Rocko.

With a history of Equine Protozoal Myelitis (EPM), I didn't panic when my 12-year-old Quarter Horse gelding Rocko started to exhibit mild neurological deficits. At first, he moved his jaw in a way that looked like something was stuck in his teeth. He would occasionally flip his head upward toward the right and eventually the right side of his face appeared droopy. He was started on EPM medication and an anti-inflammatory and the neurological deficit did not progress any further. He seemed to be improving and didn't appear uncomfortable, so we waited, giving the medications time to work. In the past his EPM episodes had responded to medications within 2-3 days. During this time, I was away attending vet school in Massachusetts and Rocko was being cared for by my family in Maine. My daughter sent me a photo of Rocko's eye one evening and that's when I panicked. A severe corneal ulcer had formed on his right eye. He was seen by a veterinarian the next day and it was recommended his eye be removed. At first the vet thought he had hit his head in the pasture and the paralysis, since it seemed mild was secondary to that, so she wasn't overly concerned. The next day just before his enucleation, before more anti-inflammatories had been given, the paralysis was worse, and the vet took radiographs of his head. The radiographs showed an enlarged right stylohyoid bone. Endoscopy of the guttural pouch confirmed the thickening of the bone, leading to a diagnosis of temporohyoid osteoarthropathy (THO).

What is temporohyoid osteoarthropathy?

THO is a progressive condition that leads to the thickening of the stylohyoid bone where it articulates with the temporal bone of the skull. The temporohyoid joint eventually fuses to the skull because of the bone remodeling, reducing the movement of the joint and the mobility of the hyoid apparatus. The hyoid apparatus is made up of the stylohyoid, epihyoid, ceratohyoid, basihyoid, and thyrohyoid bones. The hyoid apparatus has attachments to the tongue and larynx. Restriction can lead to pain, and possibly fractures that cause nerve deficits.



[1]

How common is THO?

THO is relatively uncommon, and signs can mimic those of EPM or other neurological disorders. When it does occur, it commonly affects middle aged horses, but horses of any age can present with this condition.

What are the clinical signs of THO?

Head shaking, difficulty chewing food, resistance to the bit, behavioral problems, and ear rubbing are early signs. Neurological signs such as loss of balance, head tilt, and nystagmus may develop as the disease progresses. Facial paralysis, including deviation of the muzzle to one side, droopy ear, and inability to close the eye lid may be observed. Corneal ulcers can form due to damage to the nerves that are responsible for tear production and blinking. One of the first and most common nerve deficits is hearing loss, but this often goes unnoticed.

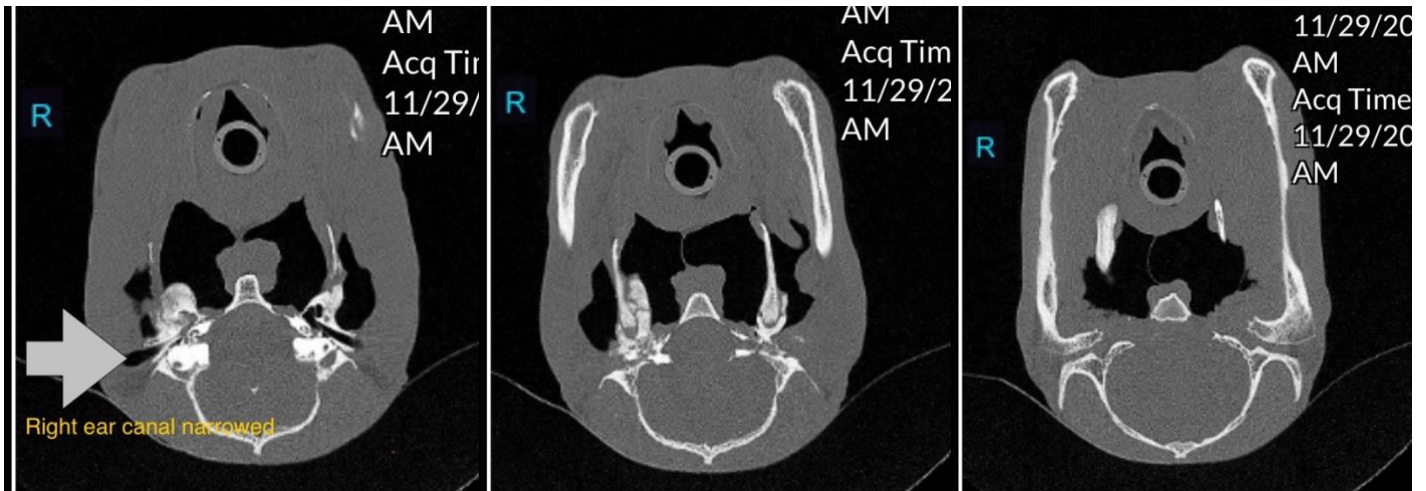
How is THO diagnosed?

Diagnostic imaging including radiographs, endoscopy, computed tomography (CT) and MRI are used to aid in the diagnosis of THO. Endoscopy is used to visualize the temporohyoid joint via the guttural pouch. The proximal end of the stylohyoid bone will appear enlarged. CT while anesthetized is commonly used as a definitive diagnosis for THO. It is common for both stylohyoid bones to be affected, however one side is usually worse.

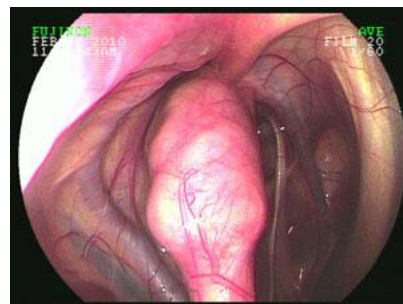
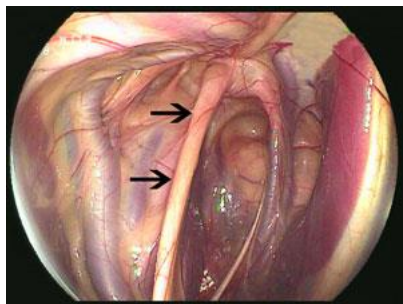


“Computed tomographic appearance of the hyoid apparatus in a clinically normal horse and in two horses with temporohyoid osteoarthropathy. (A) grade 0—normal hyoid and auditory apparatus bilaterally. (B) grade 1—mild thickening of the right stylohyoid bone and temporohyoid articulation and grade 2—moderate thickening of the left temporohyoid articulation. (C) grade 3—severe thickening of the right stylohyoid bone and temporohyoid articulation with a fracture through the proximal aspect of the right stylohyoid bone (arrow).”

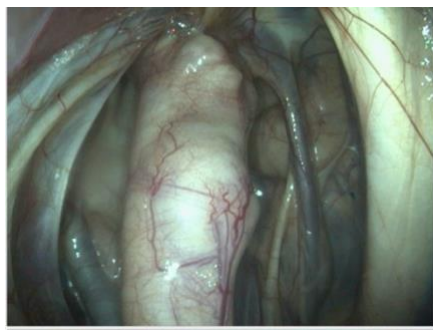
[3]



Rocko's CT done at Cummings School of Veterinary Medicine



Endoscopic view of normal guttural pouch and stylohyoid bone (arrows). Endoscopic view of callus on the stylohyoid bone at the roof of the guttural pouch where it articulates with the temporal bone of the skull. [4]



Right



Left

Endoscopy of Rocko's guttural pouch done at Cummings School of Veterinary Medicine.

How is THO treated?

THO can be approached medically or surgically. Surgery includes the removal of bone from the hyoid apparatus to reduce stress and pressure, and the risk of fracture. The removal of the ceratohyoid bone is the recommended surgical procedure. This detaches the stylohyoid from its connection with the tongue and larynx. Many horses go back to their normal lifestyle after surgery and with time, nerve deficits totally resolve in most cases. Some horses have mild deficits that remain permanently. Medical management is done using anti-inflammatories to reduce inflammation and pain and antibiotics if there is an infection present or suspected. The prognosis for horses treated medically is not as good as those treated surgically.

Can THO be prevented?

THO isn't well understood and a definitive reason for it hasn't been found. Causes have been speculated to include infection or inflammation of the middle ear or guttural pouch, degenerative osteoarthritis, and repetitive trauma to the structures from cribbing.

Rocko underwent surgery to remove the ceratohyoid bone at Cummings School of Veterinary Medicine. Rocko's CT showed us that his left stylohyoid bone was abnormal too and the decision was made to remove his left ceratohyoid at the same time as his right to prevent future complications. Rocko had active post-operative hemorrhage after surgery, which is a rare complication. He had a tracheostomy because of the swelling associated with the bleeding. He couldn't swallow for 4 days after surgery and was unable to eat anything. As the swelling decreased, his nerve deficits improved, and he has continued to improve rapidly. He is doing very well, and we are hopeful the remaining minor neurological deficits will resolve, and he will go back to performing as a barrel horse. His ear is still slightly paralyzed, and his muzzle is deviated to the left just a bit, but he is acting normal in every other way.

References

1. Phyle, V. P. (2019, February 4). The Equine Hyoid apparatus. VET PHYSIO PHYLE. <https://vetphysiophyle.co.uk/2019/02/05/the-equine-hyoid-apparatus/>
2. Equine, M. (2018, June 25). What is Temporohyoid Osteoarthropathy (THO) In Horses? - Mid-Rivers Equine Centre. Mid-Rivers Equine Centre. <https://www.midriversequine.com/temporohyoid-osteoarthropathy-tho/#:~:text=THO%20is%20relatively%20uncommon%20and,removal%20of%20the%20ceratohyoid%20bone.>
3. Temporohyoid osteoarthropathy (THO). (2023, July 28). School of Veterinary Medicine. <https://ceh.vetmed.ucdavis.edu/health-topics/temporohyoid-osteoarthropathy-tho>

4. Hilton, H. G., Puchalski, S. M., & Aleman, M. R. (2009). THE COMPUTED TOMOGRAPHIC APPEARANCE OF EQUINE TEMPOROHYOID OSTEOARTHROPATHY. *Veterinary Radiology & Ultrasound*, 50(2), 151–156. <https://doi.org/10.1111/j.1740-8261.2009.01508.x>
5. Guttural pouch Diseases » Large Animal Hospital » College of Veterinary Medicine » University of Florida. (n.d.). <https://largeanimal.vethospitals.ufl.edu/hospital-services/surgery/guttural-pouch-diseases/>
6. Divers, T. J., Ducharme, N. G., De Lahunta, A., Irby, N. L., & Scrivani, P. V. (2006). Temporohyoid osteoarthropathy. *Clinical Techniques in Equine Practice*, 5(1), 17–23. <https://doi.org/10.1053/j.ctep.2006.01.004>