



Vet Notes

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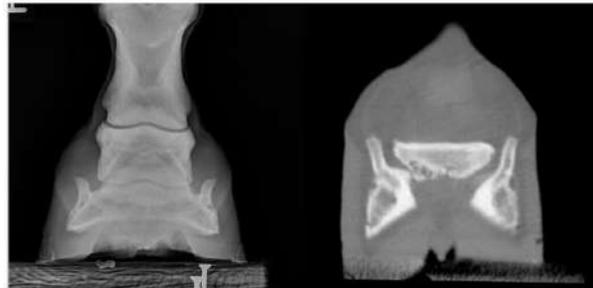
IMAGING TECHNIQUES IN EQUINE LAMENESS: ANATOMIC vs PHYSIOLOGIC

When it comes to assess the source of lameness in a horse, it is true that the expertise of a good clinician cannot be traded with any fancy equipment. However, having the correct tool that will help you rule-in or rule-out your diagnosis is always highly appreciated. Nowadays, the market offers us a huge diversity of brands, shapes, sizes and prices that can be sometimes overwhelming, thus we need to make sure that we are going to choose an imaging equipment – or more than one – that will give us the best possible answers.

Being able to discern between doing a radiography study vs a scintigraphy study – aka bone scan – requires us to know more than the fact that it can be a ‘bone problem’ since pros and cons are associated with each of them. Usually, the clinician will gather the patient’s history from the owner or trainer and perform a basic visual and hands-on examination. This basic examination may or may not provide enough information to have a final diagnosis and extra tests may be needed. At this point what do you do?

Depending on your findings at your first assessment you might have a narrowed down the differential list, now confirmation is needed. Diagnostic analgesia, also known as nerve block, has been used with a high level of confidence among expert clinicians to identify certain sources of lameness in horses extremities, however when the lameness is subtle or the horse’s demeanor doesn’t allow us to perform nerve blocks, it’s time to think on other imaging possibilities.

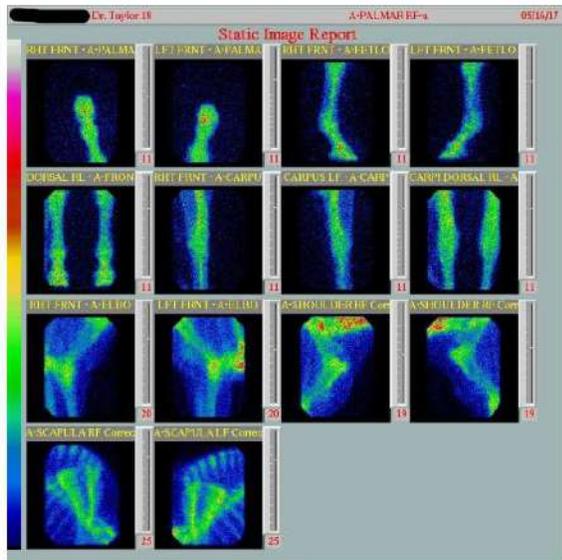
Anatomic imaging techniques are those that will provide you with structural visualization of a region as it is at the moment you’re capturing the image or short clip. Positioning of these type of equipment is critical to have a diagnostic image, so it requires trained personnel and an expert clinician to interpret the final views. Radiography and ultrasonography are the most common and usually are complementary to one to another; the first by providing information about bony tissue and the second one images soft tissue such as tendons and ligaments. MRI and



A comparison of radiograph (X-ray), left, and computed tomography (CT), right, imaging of portions of the coffin bone (on the sides) and navicular bone (centrally located) of a horse. Multiple dark regions within the left side of the navicular bone indicate degenerative change consistent with navicular syndrome. CT is much more sensitive to these changes than radiographs and allows clinicians to evaluate the navicular bone in a three-dimensional manner without superimposition. CT also allows for improved evaluation of the soft tissue structures, such as tendons and ligaments. UW SCHOOL OF VETERINARY MEDICINE

CT scan are also useful, however the image quality obtained is highly detailed and both can do multiple planes and structures that x-rays and ultrasound cannot. MRI uses a low or high magnetic field and can be done with the horse under standing sedation or general anesthesia. It can also image the head and extremities. Motion can be a limitation when in a standing position, hence only structures distal to carpi and tarsi can be done; nevertheless some clinicians state that even subtle fetlock motion can be a problem if the horse leans while being scanned. CT scan can also be performed under standing sedation or general anesthesia and will provide high quality images from a specific region – only extremities, head and neck – in slices, it's also faster than MRI reducing the chances of motion being a problem.

Physiologic imaging techniques, as the name implies, will provide images to help assess physiologic processes like metabolism or circulation. Scintigraphy and thermography are in this category and both of them allow the examination



of the entire horse if needed. Scintigraphy requires the horse to be drop off at the hospital so it can receive a short acting radioisotope that links to a bone tracer. The horse is sedated and a gamma camera can image the whole body – or just a region – and those areas where the bone is currently undergoing remodeling will show as ‘hot spots’. Images will show if the activity is focused, diffuse, mild, moderate or intense. It requires also the expertise and understanding of the clinician to interpret the results as a whole scenario. So far it is the only imaging method that allows the evaluation of the horse full skeleton. Thermography produces images of heat patterns on the horse’s body surface. It is a non-invasive technique that measures emitted heat in the form

of infrared radiation. It detects inflammatory changes that may contribute with lameness. Warmer temperatures suggest increased blood flow, which can be sign of inflammation. Cooler temperatures suggest decreased blood flow which can be a sign of restricted circulation. This last technique has the limitation that several environmental factors can also change the surface temperature of the horse, thus being probably the least used technique.

Anatomic and physiologic techniques are both part of any good diagnostic protocol once we understand their proper usage. In addition, regardless of the technique being use, client communication is a very important factor. Owners need to know and understand why certain studies are more reliable than other as well as their risks and limitations.

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Originally from Peru, Dr. Pamela S. Velarde grew up in Lima and is a graduate of the Universidad Científica del Sur. After finishing Vet School, Dr. Velarde started working at the racecourse in Lima and then moved to Lexington, KY where she worked with broodmares and prepared Thoroughbred yearlings for the sales. Her passion for horses brought her to Florida to pursue an internship at PSEH as a hospital intern. Dr. Velarde has a strong interest in internal medicine. In her spare time, she enjoys reading, show jumping, and riding her warmblood mare.

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