Stifle Lameness

Diagnosis and treatment

The stifle is the largest and most complex joint in the horse and, as such, it is an important cause of hind limb lameness. Equivalent to the human knee, the stifle is controlled by some of the most powerful muscles in the horse’s hindquarters and is subject to tremendous stress forces.

In this article, registered specialist equine surgeon Dr Marta Wereszka, from the University of Sydney Equine Hospital, explains the complex anatomy, the diagnosis of lameness associated with the stifle joint and some of the treatment options your veterinarian may recommend.

Anatomy

The stifle is actually comprised of two joints: the joint of the femur and tibia, which is called femorotibial, and the joint of the femur and patella, called femoropatella. There are three synovial joint sacs or ‘joint pouches’; the femoropatella and the medial (inside) and lateral (outside) femorotibial pouches.

Each of the medial and lateral femorotibial joint pouches are further divided into cranial (front) and caudal (rear) pouches by the femoral condyles (the rounded protuberance at the end of the bone that forms the articulation with the other bone).

The cruciate ligaments, a pair of ligaments which cross each other and connect the femur to the tibia, are situated between the two joint pouches of the femorotibial joints.

Direct joint communication between the medial femorotibial and femoropatella joints is present in most horses, however, communication between the two femorotibial joints is only present in approximately 25% of horses.

The Menisci, which are cartilaginous C-shaped discs positioned between the femur and tibia, assist in providing shock absorption and prevent bone-on-bone contact. There are also a number of important supporting ligamentous structures, including the medial and lateral collateral ligaments, as well as the lateral, middle and medial patella ligaments.

Stifle injuries

Stifle injuries can affect soft tissue, bone or cartilage and are usually either traumatic, developmental or degenerative in nature.

Regardless of the cause, insult to the stifle will usually also cause instability elsewhere in the joint, which makes diagnosis and treatment challenging in horses.

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Watch the video at:
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Above: The stifle joint in the horse. Image source: www.vetnext.com

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Assessment and diagnosis
Initial assessment of a horse should include a thorough lameness exam, including history, palpation and flexion tests. An adequate history should include the horse’s age, use, duration of lameness and whether a specific incident or injury caused the lameness.

Palpation should focus on establishing whether there is effusion (‘joint swelling’) centred over the femoropatella and medial femorotibial joints. There may be swelling associated with the supporting ligaments and chronic lameness results in atrophy (‘wasting’) of the hindquarter gluteal muscles, which should also be inspected.

Clinical signs can vary greatly depending on the severity and chronicity of the condition.

Flexion tests
Flexion tests are a routine part of a lameness examination and assist in localising a lameness to the lower limb (that part of the limb below the knee or hock, as per image on left) or the upper limb (that part of the limb including and above the knee or hock, as per image below left).

A lame horse in which the stifle is the cause is likely to appear worse after an upper limb flexion, i.e., the horse will appear more lame when trotted in a straight line. With the upper limb flexion test, however, the hock and hip joints are also flexed, therefore these will need to be ruled out as a possible cause of lameness. This is most commonly done through the use of ‘joint blocks’.

Joint blocks
Joint blocks, or more accurately ‘intra-articular anaesthesia’, can be useful in confirming a suspicion that the stifle joint is the cause of your horse’s lameness. This is where local anaesthetic is directly injected into a joint to numb the area causing pain.

Ideally, local anaesthetic should be injected into all three joint compartments to ensure all are desensitised effectively. Due to the complexity and size of the stifle joint, if the lameness improves by 50% or more this is thought to be confirmatory.

It is typical for your vet to wait up to an hour before making the final call whether the joint block has lessened the severity of your horse’s lameness. Once again, this is related to the time it takes for the local anaesthetic to work inside such a large and complex joint.

Other diagnostic tools
Findings from a lameness examination or through the use of joint blocks can, at times, be confusing and more sophisticated techniques may need to be used to screen for stifle injuries, which are typically only available in large equine hospitals.

Nuclear scintigraphy involves the injection of a radioactive isotope (Technetium 99m) into the bloodstream of the horse. This isotope circulates around the body and is absorbed by bone which is undergoing active remodelling or inflammation. A gamma camera is used to collect and record images from different parts of the body, which allows veterinarians to pinpoint exactly where the source of lameness may be (see image on right). You can read a more detailed article about scintigraphy on the Horses and People website: www.horsesandpeople.com.au/article/equine-scintigraphy.

Once the site of lameness has been confirmed to be the stifle joint, then radiographs and/or ultrasound are performed to determine a direct cause.

Radiographs are useful to evaluate bone abnormalities, whilst ultrasound is useful for evaluating soft tissue structures. These two diagnostic modalities will therefore provide very useful information when utilised together.

Once the site of lameness has been confirmed to the stifle joint and the exact cause of lameness has been determined with diagnostics such as radiographs and ultrasound, the veterinarian should be able to provide the owner with a prognosis and a treatment plan specific to the individual horse.

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Treatment options

As with all joint disease or injury, there are many treatment options available and which of these your veterinarian chooses will depend on a range of factors, including the exact nature and severity of the injury, intended future use of the horse and financial constraints.

Common treatments include, but are not limited to:

- Rest, followed by a controlled exercise program
- Direct intra-articular joint treatment: IRAP, corticosteroids, hyaluronic acid
- Systemic treatment with drugs, such as: phenylbutazone, oral joint supplements, pentosan
- Surgery: Arthroscopy, blistering of patella ligaments
- Complementary therapies: massage, chiropractor, acupuncture

Systemic treatments

Nonsteroidal anti-inflammatory medications include:

PhenylButazone (‘bute’) which has been the mainstay of treatment for joint disease for many decades and works well to decrease lameness due to its rapid onset of action and strong anti-inflammatory action. Bute, however, is not a long term treatment for horses involved in competition, due to its long swelling time and both kidney and intestinal side effects.

Meloxicam is a newer anti-inflammatory medication which is reported to have fewer side effects than phenylbutazone and a shorter withdrawal time.

Pentosan and Pentosan Halo. Pentosan polysulphate is derived from a plant (beechwood extract) and is registered for intramuscular administration in the horse. Pentosan Halo contains an additional ingredient, HA, which is administered in a separate syringe and given intra-

venously in the horse. These products aid in healing of mild cartilage disease. Experimental studies performed in horses have revealed improvement in lameness and joint flexion as well as reduced inflammation inside an arthritic joint.

Oral joint supplements. There is a vast number of different oral joint supplements available for the horse. The specific formulation, concentration and source of products differs considerably. However, most contain one or more of the following: chondroitin sulphate, glucosamine, hyaluronan, MSM. Many of these products work by providing molecules which are naturally found and have important properties in cartilage or joint fluid, and which undergo depletion when there is inflammation within a joint.

Scientific studies have indicated that these products are effective in the treatment of joint disease in humans. However, in horses, treatment efficacy is based more on individual opinion, rather than substantiated by quality scientific studies. An interesting report in human literature compared the label ingredient with the independent testing of the products and found little correlation to the label claim and content or price and content. This potentially emphasises the use of trusted brands that have at least undergone some testing.

Direct intra-articular joint treatment

Corticosteroids are the most potent anti-inflammatories available and are injected directly into a joint (termed ‘intra-articular’) to provide rapid pain relief. Furthermore, it has been shown in controlled scientific studies that using ‘low doses’ of corticosteroids can improve the integrity of the cartilage.

Controversy exists surrounding the use of intra-articular corticosteroids due to the reported potential side effects. Much of this controversy is based on unsubstantiated statements in the lay press. Furthermore studies which revealed potentially harmful effects of IA steroids were conducted using normal joints and cartilage.

Current research suggests that inflamed and arthritic joints do not exhibit the same harmful effects seen in normal joints when IA steroids are administered.

Some consideration should be given to the reported incidence of corticosteroid-induced laminitis; however, no direct association has ever been proved. Caution should be undertaken in horses which have had laminitis and which are prone to developing laminitis.

Hyaluronic acid (HA) is an essential and normal component of joint fluid and cartilage.

It provides joint fluid with the properties of lubrication and elasticity, which is necessary for a smooth and even gliding joint surface. HA is commonly injected in conjunction with a corticosteroid inside a joint and also acts as a natural anti-inflammatory and enhances the action of the steroid.

HA can also be injected intra-

venously in conjunction with Pentosan.

IRAP (Interleukin 1 receptor antagonist protein)

Blood is taken from the horse and incubated with special glass beads that promote the production of regenerative and anti-inflammatory proteins by the white cells in the blood. The sample is centrifuged and the serum containing these proteins is harvested. This serum is injected into the affected joint. Usually a series of three to four injections is performed every 1-2 weeks.

This treatment can work well for horses with mild arthritis and no significant radiographic changes. IRAP is not swallowable as it is made from the body’s own proteins.

Complementary therapies

In horses with initiating mild arthritis, all that may be required is to keep the animal sound is increasing the warm-up period prior to intense work.

In other cases, it is necessary to reduce the work intensity and duration whilst treatments are initiated to allow medication time to take effect.

Complementary therapies such as massage, acupuncture and chiropractic can also be incorporated into the training regime (read the article by veterinary chiropractor Grant Harris on page 18). The response to these adjunctive treatments is quite variable and therefore, some experimentation to find out what works may be necessary.
Bone cysts – these are areas where there is a lack of bone below an area of (usually abnormal) cartilage

Medicating a joint and making it pain-free in the cases listed above will only aggravate the arthritis and further its progression. For this reason X-rays are commonly performed to assess the affected joint in order to screen for potential surgical problems.

Arthroscopy

Arthroscopy is the most common method by which joints are assessed and surgically treated. It involves making keyhole incisions directly into the joint and placing a special instrument called an arthroscope into the joint, so that the interior can be viewed on a monitor. This technique has been adapted from humans and reduces post-operative complications, such as infection and scar tissue. Image courtesy of Marta Wereszka.

Stem Cell therapy

Stem Cell therapy involves harvesting cells from the bone marrow of the injured horse. Stem cells are ‘mother’ cells that have the potential to become any type of cell in the body. In the image above bone marrow is being Aspirated from the sternum. The sample is sent to a specialist laboratory and, a few weeks later, the stem cells are sent back ready to be injected into the lesion site.

Surgical treatments to remove either the offending or major contributing cause of arthritis is required in the following cases:

- Bone chips – these can occur as a consequence of the arthritis or intensive training
- OCD (osteocondrosis) – it is a congenital problem where due to a variety of reasons, such as nutritional and genetic disposition, bone chips form in specific locations
- Bone cysts – these are areas where there is a lack of bone below an area of (usually abnormal) cartilage

Joint resurfacing techniques

Due to the inherent poor healing of cartilage defects, a considerable amount of research has been performed in the last decade evaluating different surgical treatments for focal cartilage defects.

Despite this, problems exist with each technique currently developed.

For example, there can be great difficulty in gaining surgical access to certain areas of the joint where joint disease occurs (e.g. weight bearing surfaces of the stifle joint). Often, specialised equipment is required as well as specialised surgical expertise, and this comes with a substantial cost.

Arthroscopy of the stifle joint. Using keyhole incisions and a special instrument, the interior of the joint can be viewed on a monitor while reducing post-operative complications such as infection and scar tissue. Image courtesy of Marta Wereszka.

This month’s contributor to the health feature from Equine Dental Vets

Dr Marta Wereszka, BVMS MS DACVS

Dr Marta Wereszka is a registered specialist equine surgeon. Marta has extensive and advanced surgical experience in horses of all disciplines having worked previously at Singapore Turf Club, Morphettville Racehorse Hospital in Adelaide and Marion DuPont Scott EIMC in Virginia, USA, the latter where she undertook advanced surgical training. She currently works at the University of Sydney Equine Hospital. Marta’s special interests are lameness, arthroscopy, emergency surgeries and wound repair.

Once the site of lameness has been confirmed to the stifle joint and the exact cause of lameness has been determined with diagnostics, such as radiographs and ultrasound, the veterinarian can provide the owner with a prognosis and a treatment plan specific to the individual horse.

This is why many of the techniques scientifically evaluated have not been found to be easily applicable in the clinical setting. Furthermore, true, evidence-based follow-up of horses with naturally-occurring clinical joint disease, and the outcome following treatment is lacking, making the justification of using any of these techniques very difficult.

Stem cells

An exciting emerging application for stem cell therapy in horses is in the management of lameness associated with osteoarthritis.

Stem cells are harvested from the bone marrow or fat and are injected directly into the affected joint. Stem cell treatment has been used in conjunction with arthroscopic surgery when typically the results from surgery alone would be poor.

The potential benefits for the use of stem cells in osteoarthritis includes relates to the anti-inflammatory properties of stem cells and also their ability to embed within the joint, as well as their capacity for self renewal resulting in a prolonged duration of effect. Candidates for stem cell treatment for osteoarthritis are those horses that fail to respond or become refractory to conventional treatments, or those horses that suffer side effects from non-steroidal anti-inflammatory or corticosteroid medication.

Conclusion

The most important aspect of lameness diagnosis is to apply a complete step-by-step approach to confirm the exact location of the pain.

Whether or not your horse has a stifle problem directly causing lameness can only be established through the use of a logical, systematic approach, and this is vital in order to justify the targeted therapy and increase the prognosis of a horse returning to an athletic career.

References:


It was around about 5 years of age when “With Pleasure M’ lord” aka “Lannie’ s ” stifle started locking up. It started to occur when he was having a growth spurt. I had previously had a young Galloway’s stifle’s operated on and wow! I would never do it again. It was not successful at all and the horse was never the same after being done.

So with his stifle I had a vet inject locking up to the point where we had to back him up and then walk forward, I decided to up Lannie’ s dose of Technyflex to 4 x scoops daily and within a week his stifle was no longer locking. Over time, he has pretty much grown out of it. He is now eleven years of age and we see no sign of it what so ever, even when he is on spell and he does not get TFX, but when he is in work, he always has a daily maintenance dose of Technyflex to help his joints, ligaments and tendons. To this day, there is no sign of his locking patella.

“Natalie Jankowski and Lannie”

We have had many customers ring with similar problems and all seem to have had complete success, when using Technyflex for this problem!

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Images courtesy of the Equine Hospital, University of Queensland Veterinary Medical Centre, Gatton.