Soft tissue injuries of the stifle

Roger KW Smith
The Royal Veterinary College, UK

Introduction

While the stifle is a common site of developmental conditions such as osteochondrosis in the young animal, soft tissue injuries of the stifle are a relatively common cause of lameness in adult sports horses.

Diagnostic techniques

Many stifle injuries in the adult horse are traumatic in nature and so history of a fall or trauma is usually present. Lameness is highly variable and is not specific to the stifle. However, as the stifle is responsible for a considerable amount of the protraction phase of the stride, the cranial phase of the stride is often reduced and the lameness is usually as evident, or worse, on soft ground compared to on hard ground. 'Drawer' tests have been advocated in horses, similar to in humans and small animals, but these are difficult to do, inconsistent, and can be dangerous so upper limb flexion tests, while less specific, are the recommended excitatory tests.

Diagnosis depends on palpation, diagnostic analgesia and diagnostic imaging. The cranial, medial and lateral aspect of the stifle should be carefully palpated where joint distension and alteration of the position of the menisci can be detected. Diagnostic analgesia of all three joints should be performed in those cases were the location of the lameness is unknown because of variable physical and functional communication between the three separate stifle joints (Reeves *et al.* 1991).

Diagnostic imaging should involve a minimum of radiography (lateromedial, caudocranial, caudolateral-craniomedial oblique, and flexed lateromedial views) and ultrasonography (cranial, medial and lateral aspects), which, when combined with arthroscopy provides the most efficient definition of stifle injury. Gamma scintigraphy frequently does not give a diagnosis in the stifle because of the high frequency of soft tissue injuries in adult horses and advanced imaging (For example, MRI and CT) requires a general anaesthetic and is only available in some centres.

Management of specific conditions

Bruising and muscle damage

When sports horse hit a fence, trauma to the cranial aspect of the stifle is common. Bruising in this area can result in haematoma formation, characterised by a fluctuant swelling which is compressible and heterogenous in echogenicity on ultrasound. These cases should also be evaluated using sky-line (cranioproximal-craniodistal oblique) radiographs for possible medial pole fractures of the patella which can be easily missed on standard radiographs.

Muscle tears have also been observed in the quadriceps musculature, manifest as swelling with fluid collection and evidence of torn muscle fibres.

Treatment of these soft tissue lesions is conservative with rest and carry a good prognosis.

Patellar ligament desmitis

Over-strain injury to these ligaments is rare. The most commonly affected ligament is the middle patellar ligament. Clinical signs include swelling surrounding the ligament with pain on palpation with the stifle semi-flexed. Results of diagnostic analgesia of the stifle is variable and can be negative. Treatment is conservative but there is limited clinical data available on outcome, but the prognosis is considered to be guarded for those severe cases with persistent lameness.

Combination injuries

The triad of injuries to the cranial cruciate, medial meniscus and medial collateral ligament is seen in human and small animal clinical practice but is rare in horses except with severe impact trauma to the stifle. By far the most common soft tissue injury is an isolated injury to the meniscus.

Meniscal tears

Meniscal tears are the most common injury of the stifle in the adult horse. The meniscus cannot be comprehensively evaluated with any imaging technique and the best evaluation is achieved by a combination of radiography, ultrasonography, and arthroscopy (Schramme *et al.* 2006). Arthroscopy will enable the cranial and caudal poles to be evaluated while ultrasonography allows the identification of pathology within the body of the meniscus, not visible arthroscopically. The menisci is easily identified ultrasonographically with the transducer aligned longitudinally. The meniscus and the collateral ligament can be identified (and the popliteal tendon lying between the lateral meniscus and the collateral ligament on the lateral aspect).

Injury is invariably associated with moderate to severe lameness and distension of the femorotibial (and femoropatellar) joints. Medial meniscal injuries are more common than lateral and based on recent biomechanical studies, are believed to occur because the cranial horn of medial meniscus is compressed and minimally mobile when the stifle is extended (Fowlie *et al.* 2012). This also explains why most tears arise in the cranial aspect of the menisci and extend variably caudally.

Chronic meniscal pathology often results in osteoarthritis of the femorotibial joints identified by new bone on the medial intercondylar eminence of the tibia (MICET) and osteophytes on the perimeter of the tibial plateau.

Meniscal tears have been classified into three categories arthroscopically:

- Grade I – confined to the cranial ligament of the meniscus
- Grade II – tears extending from the cranial ligament of the meniscus into the meniscus but where the entire tear is visible arthroscopically.
- Grade III – a tear in the meniscus which extends past the field of view.

In addition, a fourth grade representing meniscal tears occurring within the body of the ligament that cannot be seen arthroscopically can be included (Schramme *et al.* 2006). The prognosis for Grade I injuries is 63%, 56% for Grade II, and 6% for Grade III (Walmsley 2005). Arthroscopic debridement is the treatment of choice. More recently, concurrent biological therapies (such as intra-articular mesenchymal stem cells) have also been used based on evidence of meniscal regeneration in experimental animal models (Murphy *et al.* 2003). In limited number of reported case series, this appears to have improved the outcome (Ferris *et al.* 2014) although this author would recommend their use only in those cases with a stable stifle without meniscal displacement.

Cruciate ligament desmitis/rupture

Cruciate injuries are much rarer than in small animals and are difficult to diagnose with confidence without arthroscopy. The cruciate ligaments lie under a thin layer of synovial membrane. Damage is usually manifest by areas of fibre rupture or haemorrhage. In addition, avulsion fragments of bone can be found at the origin and insertion sites of the ligaments. New bone on the cranial edge of the medial intercondylar eminence of the tibia is believed to be more associated with meniscal pathology than cruciate damage, although fragmentation of the medial (or lateral) intercondylar eminence can occur following cruciate ligament injury. Careful assessment of other soft tissue structures of the stifle is important to check for other concurrent pathology. Treatment consists of debridement and 3-6 months rest. Some contained injuries have been treated with arthroscopically guided intra-ligamentous injections (For example, with mesenchymal stem cells).

Collateral ligament desmitis

Again, a rare injury. Severe injury results in a widening of the joint space on the side of the injury. Enlargement of the ligament is the most obvious sign when examining them ultrasonographically. In some cases, avulsion fractures of the insertion sites of the ligament can occur. If the damage to the ligament produces significant joint instability, the prognosis is poor.

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