Diagnostic stifle arthroscopy in 28 horses

Aim of the study: to review horses than underwent diagnostic stifle arthroscopy between June 2007 and December 2009 at Clyde Vet Group Equine Hospital (CVGEH).

Criteria for case selection within study. All horses were lame with the source of the lameness located to the stifle. No cases were included in this study with obvious radiographic or ultrasonographic abnormalities. (e.g. Osteochondrosis dissecans (OCD) of the lateral trochlear ridge, Osseous Cyst Like Lesion (syn bone cyst) on the medial femoral condyle, collateral ligament desmitis, patella fracture or overt osteoarthritis (OA))

History prior to referral.
Acute onset severe lameness had been present in 8 cases. Nine horses were initially presented by the owner to the referring veterinary surgeons for a reduction in performance or temperament changes not directly due to hindlimb lameness. Interestingly 7 of these horses were aged 3-5 and had just come started full work following having been broken or had just started full work following a change of ownership.

The duration of lameness prior to presentation was difficult to truly assess because many of the 9 horses with a history of poor performance did not have a definitive starting point, however the average time prior to initial assessment at CVGEH was assessed at approximately 5.5 weeks.

Approximately 30% of the cases had been treated unsuccessfully with intra-articular medication prior to the surgery (this was mainly conducted at the CVGEH but at least two had been treated by the referring veterinary surgeons)

Clinical cases

Twenty eight cases (mean age 7.6 years, range of 4 –14) matched the criteria for selection into this study. There were 20 geldings, 7 mares and 1 stallion and the breeds represented were Warmblood (11), Thoroughbred (6), Irish Draught cross (4), Welsh cob (3), Cob (2), Thoroughbred cross (1) and Welsh section B (1). This was not untypical of the CVG Equine Hospital population. The horses were used for a variety of activities general activities (8), dressage only (6), showjumping (5), pleasure/hacking (3) racing (2) pony club (2), and 2 horses were just broken. The horses grouped in the general grouping where active horses who were involved in a variety of activities throughout the year including dressage, eventing, and showjumping.

Lameness assessment.

In order to establish the seat of lameness all horse were subjected to a clinical examination. The grade of lameness was graded on a scale of 1-10, 1 being only just detectably lame and 10 being non-weight bearing. 8 horses were found to be bilaterally lame and the lamer limb was used to grade the lameness.

The horses were lame (or lamer when bilaterally lame) on the left hindlimb (16 cases) and the right hindlimb (12 cases)

All horses, except 2, had intra-articular anaesthesia of the stifle conducted to confirm the stifle as the site of lameness. The two horses that did not have intra-articular anaesthesia both had gross distension of the femoropatellar joint and a history of an acute onset lameness with peri-articular swelling. The decision not to block these two cases was based on the strong clinical signs and the history gave concern that anaesthesia of the joint could cause catastrophic damage (one horse was later found to have suffered a fracture of the medial fibrocartilage of the patella and the other had collapse of the lateral meniscus).

Nuclear scintigraphy has used as part of the lameness work up in 10 horses (36%). Whilst scintigraphy is often been considered less fruitful at detecting stifle lameness than other anatomical areas using region of interest (ROI) analysis it was able to pick up areas of increased radiopharmaceutical uptake (IRU) and as significant it was useful to rule out other sites of inflammation/damage

Imaging.

All horses underwent radiographic assessment and three views were taken as standard in all cases (lateromedial, Caudocranial and Caudolateral-cranio medial obliques views). In many horses additional projections were taken (for example skyline of the patella).
Ultrasonography of the stifle is a useful tool to assist diagnosis any site of damage in the joint. It was carried out in 26 cases (93%). In all cases it was used in it revealed a significant effusion within one or more of the three compartments of the stifle. In some cases there was a suspicion of meniscal damage as indicated by a convexity of the abaxial margin of the meniscus however there was not sufficient signs to confirm and qualify the damage. (During the duration of the study several horses were found to have significant ultrasonographic damage such as meniscal tears, collateral ligament damage or patella ligament damage (these horses are not included in this study.)

Anaesthesia. Anaesthesia was induced with ketamine following pre-medication with ACP and romifidine and anaesthesia was maintained with Isoflurane and occasional use of midazalam. Direct blood pressure, expired CO₂, blood gases and ECG were monitored throughout the surgeries and all horses recovered using our assisted recovery system.

When the arthroscopy demonstrated considerable pathology intra-operative morphine was also given.

Surgery
During the period of this study numerous other horses underwent arthroscopy for treatment of stifle abnormalities detected on radiography or ultrasonography and these are NOT included in this study, particularly OCD of the lateral trochlear ridge of the femur and treatment of osseous cyst like lesions (OCCL) in the medial femoral condyle. All horses received peri-operative treatment of antibiotics (penicillin and gentimicin) and phenylbutazone.

Post operatively all horses remained stabled and on a controlled exercise programme for a minimum of 6 weeks up to a maximum of 18 weeks based on the damage found at surgery.

Surgical technique used.

Femorotibial joints:- The Cranial approach was used in all cases to assess the cranial pouches of the medial and lateral femorotibial joints. With the horse in dorsal recumbancy with the limb in 90 degrees of flexion the arthroscope was inserted into medial femorotibial joint (MFT) via a skin incision made between the medial and middle patella ligaments. Following assessment of the MFT the scope was replaced with a blunt obturator in the arthroscope sleeve and passed through the median septum behind the tendon of the origin of the long digital extensor muscle into the lateral femorotibial joint (LFT) where the scope was reinserted into the sleeve. Since 2009 it has been practice to enlarge the hole created in the septum to at least 2 cm² because this can ensure that any post-operative intra-articular medication can move freely between the MFT and LFT. In selected cases the fascia over the cranial (anterior) cruciate ligament (ACL) was removed with a motorised synovial resector, allowing better visualisation of the ligament and as help debridement of damaged ligament. With the arthroscope in each cranial pouch the limb was flexed and extended using a winch to assess as much of the respective femoral condyles as possible.

The Caudal pouch of the MFT was approached as described by Trumble et al (1994). With this approach it was possible to probe some of the extra-synovial caudal cruciate ligament through the synovial membrane. It was not normal practice to access the two caudal pouches of the LFT due to the possibility of damage to the peroneal nerve and the limited visualisation due to the presence of the popliteal tendon that divides the pouch in two.

Femoropatellar joint:- In all cases even if there was significant pathology found in the MFT or LFT the Femoropatellar joint (FP) was always assess. The FP joint was approached in the standard approach between the middle and lateral patellar ligaments, halfway between the tibial crest and the distal aspect of the patella. (McIlwraith et al 2005)

All portals were suture in routine manner before the sites were covered with Primapore and then Polster dressings for recovery using our assisted recovery system.

Assessment of lesions found at surgery.

CCL lesions were graded using the scale described by Walmsley 2005. Grade I is mild superficial disruption of the fibres Grade II obvious separation and grade III is rupture of the fibres.

Meniscal tears were graded using the scale described by Walmsley et al 2003 grade I is a tear of the Cranial medial (or lateral) meniscal ligament (CML) extending into meniscus. Grade II is a complete tear in the cranial pole of the meniscus and the CML whose limits can be see arthroscopically and
Grade III is similar to Grad II except the full extent of the tear extends caudally beneath the femoral condyle. Two cases had meniscal lesions that did not fit this grading scale. Damage to articular cartilage was difficult to group however there were two main groups defects on the medial and lateral femoral condyles. Group A was described as the so-called osteochondrosis as described by Schneider et al 1997. The cartilage is dimpled, wrinkled and folded and not firmly attached to the subchondral bone. With this condition applying pressure to the articular cartilage with a blunt arthroscopy probe consistently revealed areas of loose cartilage through which the probe could be easily inserted into soft subchondral bone. This has been classified as osteochondrosis of the medial femoral condyle. Group B was described as osteoarthritis where there was generalised or focal areas of full or partial thickness articular cartilage loss. The subchondral bone in these cases appeared normal.

RESULTS

<table>
<thead>
<tr>
<th>Site of damage</th>
<th>Times observed</th>
<th>Primary problem</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranial Cruciate</td>
<td>6</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Grade I</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Grade II</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Grade III</td>
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<td>2</td>
<td></td>
</tr>
<tr>
<td>Menisci and associated ligaments</td>
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<td>6</td>
<td>21</td>
</tr>
<tr>
<td>MCML grade I</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>MCML grade II</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MCML grade III</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Severe laxity of the medial meniscus</td>
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<td>1</td>
<td></td>
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<tr>
<td>LCML grade I</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCML grade II</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>LCML grade III</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>Collapse of lat meniscus</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>Articular Cartilage</td>
<td>25</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>Medial condyle “osteoarthritis”</td>
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<td>7</td>
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</tr>
<tr>
<td>Lateral condyle “osteoarthritis”</td>
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<tr>
<td>Medial and lateral condyle osteoarthritis</td>
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</tr>
<tr>
<td>OCD of MTR</td>
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<tr>
<td>OA of cranial aspect MFT</td>
<td>2</td>
<td>2</td>
<td></td>
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<tr>
<td>Ca pouch of MFT</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>OA of LFT</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>OA of both LFT and MFT</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>OA of FP</td>
<td>1</td>
<td>1</td>
<td></td>
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<tr>
<td>Chondromalacia of the patella</td>
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<td></td>
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<tr>
<td>Fracture of the medial fibrocartilage of the patella</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Multiple lesions</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>
Lesions on the medial and lateral condyle was found that 25% of cases the sole
There were immediate post operative complications and one horse developed Facitis 8 days post
operatively which responded within 2 days to antibiotic therapy. The degree of reaction was viewed to
be mild.
Facilitis is a recognised complication of stifle arthroscopy

Discussion

Not operated when overt radiographic or ultrasonographic signs were include

Removal of >15 mm of articular surface of the medial femoral condyle has been shown to result in
a<30% return to racing (Sander et al 2002). Furthermore it recently has been suggested that surgical
debridement of medial femoral condyle OCCL should be avoided to avoid the risk for subsequent
meniscal injury, which can be severe (Hendrix et al 2010). This is one of several reason why the
current surgical advise is to treat OCCL by the injection technique as described by Wallis et al 2008).
During the time of this study the injection technique was used in several horses at CVGEH for femoral
condyle OCCL.

and there were areas of considerable articular cartilage loss These have been found as the only
abnormal finding in 25% of horses undergoing diagnostic arthroscopy.
**Epiploic foramen entrapment involving the distal ileum in the horse**

The epiploic foramen is an approximately 4 cm long rent in the roof of the abdomen formed between the caudal vena cava, the caudate lobe of the liver, pancreas and the portal vein. Entrapment of the small intestine in this rent is a relatively uncommon cause of surgical colic, it is however noted that horse’s that are prone to wind-suck are 18 times more likely to develop this condition those which do not display this behaviour. The jejunum is the most commonly involved area of small intestine to be entrapped the foramen. Surgical treatment of the entrapment can have serious complications including haemorrhage and difficulty in removing distended intestine through the rent due to its narrow size. The intestine can enter from either the left or right; although those that enter from the left have usually done so following damage or involvement of the lesser omentum.

The prognosis for successful outcome of epiploic foramen entrapment is between 18-82%. In the past 2 years we have operated on had four horses, all wind-suckers, for treatment of this condition. The primary presenting sign on 2/4 case is severe intense pain. In one case the pain was such that the horse collapsed in the car park. Rectal examination in all cases revealed distended loops of small intestine, although in all cases haemodynamically the horses were showing no evidence of significant dehydration.

Standard anaesthesia was induced in all cases including the use of a ventilator

In 2 cases there was involvement of the proximal ilium only and in the other two the ilium and adjacent distal jejunum was involved. The length of bowel entrapped ranged from 9 inches to 3 feet. Removal from the foramen required a combination of gentle traction and decompression by manually pushing the luminal contents through he epiploic foramen. In all four cases there was no requirement to resect any compromised bowel.

All horses recovered with our assisted recovery sling system.
Pain in the neck.

Since the hospital has opened we have dealt with a number of horses that have presented with apparent neck pain. The owners complaint has been for one of three reasons a) inability to flex the neck b) apparent ‘locking’ of the neck where the head and neck become ‘fixed’ and the horse is temporary unable to elevate the head for a few seconds to minutes and c) forelimb lameness. All horses with confirmed neck pain have undergone a nuclear scintigraphy examination because enlargement and arthropathy of the caudal cervical vertebrae (particularly C6/C7 and to a lesser extend C5/C6) can be present in clinically normal horses (Down and Henson EVJ 2009). Oblique radiographs are taken when required to give more detail of the articular facets and pedicles of the vertebrae and on occasions and (Dimock and Puchalske EVE 2010) we have undertaken myelography to assess for any spinal cord compression.

Horse 1. Presented with left forelimb lameness that virtually disappeared after 14 days. Mild swelling of the lower left cervical area was present for 72 hours. Significant increased radiopharmaceutical uptake (IRU) was present at C6/C7. A fracture of the left cranial articular facet of C7 was identified on radiography. After 8 weeks box rest the horse was turned out for a further 2 months prior to the resumption of work. The horse has subsequently competed at intermediate eventing

Horse 2. Non specific neck stiffness was identified by the owner. Nuclear scintigraphy identified a significant IRU just caudal to the withers. Radiography identified a focal area of radiodensity on the left side of the dorsal spinous process of the 9th and 10th Thoracic vertebrae. Resection of the affected DSP and the associated reaction was suggested as a possible treatment.

Horse 3. A thoroughbred which has been seen to ‘lock’ the neck on three known occasions. Following ‘release’ of the locking the horse was noted to be ‘wobbly’. Our examination revealed no lameness nor neurological defects, however we did not witness the locking. Bone scan identified significant IRU at C6/ C7. Significant articular facet arthropathy was present on radiographs and considerable ventral enlargement of the facets. The horse was treated with intra-articular medication into both the right and left articular facets with methylprednisolone Acetonide (Martinelli et al 2010). Hopefully further enlargement does not happen or possible forelimb lameness may develop.
“His Hip was out”

Statements like the above are not uncommonly told to vets. Often a ‘back man’ may have put ‘the hip back in’. Whilst such comments should not be overlooked they are rarely true. In Georges case the comments had a grain of truth.

George (650kg Cob) was presented for a history of fairly severe right hind limb lameness that did not respond to any conservative treatment prior to admission to the Hospital. The lameness did not respond to any of peri-neural or intra-articular anaesthetic test (excluding the hip joint). The only nuclear scintigraphy abnormality was mild or moderate IRU in the hip region. Standing radiography of the hip joint was attempted but due to the horses size and shape diagnostic quality radiographs were not obtained. The horse underwent a general anaesthesia and with the horse in dorsal recumbancy radiographs demonstrating considerable Osteoarthritis were obtained.
4 cases of non-strangulation entrapment of the ilium in the Epiplioic foramen.

The epiplioic foramen, or foramen of Winslow, is about 4cm wide entry into the vestibule of the omental bursa. The foramen is formed by the base of the caudate lobe of the liver, the portal vein and the gastropancreatic fold. Three cases the ilium was entrapped in a left to right direction small intestine in the Epiplioic foramen is a not uncommon cause of

The short term published survival rate after surgery varies from 18%-88% but in one study (Proudman et al EVJ 2002) they had a significantly lower probability of long term post operative survival

A higher incidence had been noted with horses that are stabled (74% of cases occur between November and March). In another study 68% of horses that get EFE were crib bitters compared to 10.4% of the control group;

All 4 horses included in this series were crib bitters and the entrapment was in a