Meniscal injury in the dog is most commonly associated with cranial cruciate ligament (CrCL) insufficiency. The reported incidence varies from 33.2% to 77%. In a recent study reporting a series of 1000 dogs treated for CrCL insufficiency, 33.2% of dogs presented with a meniscal tear diagnosed at the time of the first surgery. The sex distribution was 39.7% neutered males, 32.2% neutered females, 13.7% intact males and 13.4% intact females. Isolated meniscal tears are very rare but have been reported in Boxers, working dogs and in association with osteochondral lesions. When CrCL insufficiency is present, the medial meniscus is more commonly affected than the lateral meniscus. Lateral radial tears have been also reported with an incidence of 77%. Their significance is unknown as frequently are limited to the free axial edge. Another clinical presentation of meniscal injury is as a late complication of surgical management of the CrCL-deficient stifle joint. Postliminary medial meniscal tears may be a result of residual stifle joint instability and latent tears represent a failure of diagnosis at surgery. These tears may result in persistent lameness and require additional surgical treatment. The incidence of postoperative meniscal injury has been reported for several surgical techniques, and it varies between 2.8% and 17.4%. Clinical manifestation of postoperative meniscal injury is usually within the first 4 months after surgery, and in most cases requires surgical intervention. There are only a few large epidemiologic studies evaluating incidence and risk factors for meniscal injury in dogs. No association between meniscal injury and breed, sex and tibial plateau angle has been found. The existing clinical data suggest an increased incidence of meniscal tears in overweight dogs, and in dogs with chronic and complete CrCL rupture. The menisci provide several vital functions in the stifle, including load bearing, load distribution, shock absorption and joint stability. Their wedge shape is ideal to act as a spacer between the femoral condyle and the tibial plateau, and when there are no compressive weight-bearing loads across the joint, limit contact between the articular surfaces. Under static-loading conditions, the menisci assume a significant load-bearing function in the stifle. The larger contact area allows the menisci lower the stress of the cartilage, protecting against mechanical damage to both the chondrocytes and extracellular matrix. Together, the menisci bear between 40% and 70% of the load across the stifle.

**Diagnosis of Meniscal Pathology: What’s NEW?**

Meniscal injury secondary to CCL insufficiency occurs in 40-70% of cases. Surgeons that routinely diagnose less than 10-20% of meniscal tears with concurrent CCL insufficiency are likely missing some tears. Most meniscal tears cause persistent lameness if left untreated. Furthermore, better surgical exposure may decrease the risk of iatrogenic damage of cartilage and allow more accurate meniscal treatment. Therefore meniscal evaluation by arthroscopy, arthrotomy or by advanced imaging should be considered in every case. Techniques such as stifle distraction and meniscal probing can increase diagnostic accuracy for diagnosis of meniscal injury. For these reasons arthroscopic examination of the meniscus with accurate probing is considered the best method for diagnosing meniscal pathology in dogs. The magnification and illumination provided during arthroscopy allows close evaluation of the menisci. For example, the tibial surface of the meniscus can be directly inspected with arthroscopy but cannot be exposed with an arthrotomy. In addition, the joint can be evaluated in a more anatomically normal position during range of motion, which is not easily attainable with arthrotomy.

Despite its high diagnostic accuracy, arthroscopy itself presents several challenges that may decrease its diagnostic sensitivity for meniscal diagnosis. A few practical tips may be useful...
to improve the meniscal exposure using arthroscopy. Precise positioning of the initial skin incisions is crucial because the portal location dictates whether sufficient access for inspecting all relevant areas of the joint is possible. The optimum position of the portal site is determined by reference to the palpable anatomical structures and any specific conformation. The instrument portal should be positioned to give optimal access to the pathologic structures requiring treatment. The conformation of the tibial plateau should be considered when positioning the arthroscope portal. For example, in dogs with a very steep tibial plateau angle it is recommended to move the scope port more proximal than in normal dogs. Additionally, one of the most common errors is to forget having a 30 degrees oblique view. By rotating the light source, the direction of the camera can be changed. Small changes can offer significant improvements.

Diagnostic imaging is not widely used for diagnosing meniscal pathology yet. Ultrasonography has been reported as a sensitive and specific method for non-invasive diagnosis of meniscal pathology in dogs. New techniques such as stress MRI may improve the sensitivity and specificity of MRI. Another valid imaging technique is CT arthrogram, which allows performing multiplanar reconstructions to evaluate the continuity of the cranial and caudal cruciate ligaments and menisci.

**Meniscal Treatment: What’s NEW?**

Following accurate diagnosis of meniscal pathology, the best treatment for return to function should be selected. Opinions on which is the best meniscal treatment varies among surgeons. Despite the evidence (based on cadaveric and experimental studies) that meniscectomy or meniscal release predisposes to osteoarthritis, it is difficult to draw clear guidelines on meniscal treatment. Clinical studies have shown that meniscal release decreases the rate of late meniscal tears without having a short-term detrimental effect on limb function. Thus, some surgeons support the use of meniscal release as a prophylactic treatment. In contrast, there is strong evidence that an intact meniscus may improve stifle biomechanics, and therefore (potentially) decrease the progression of osteoarthritis in the long term. It is likely that increased diagnostic accuracy for meniscal pathology may decrease the risk of late meniscal tears. Therefore, accurate diagnosis, client communication and stabilization of the CrCL deficient stifle may lower the incidence of late meniscal tears without the need for meniscal release. One of the recent in vivo biomechanical evaluation of the CrCL deficient stifle stabilized with TPLO clearly showed that an intact meniscus is crucial to reestablish a normal joint alignment. About 30% of dogs operated with TPLO were found with persistent cranial tibial subluxation. Most of these dogs had meniscectomy, in contrast to all of the dogs with normal joint alignment which had an intact meniscus.

**REFERENCES**