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Clinical Reports

Isolated lateral meniscus rupture in dogs: case report

Ruptura isolada de menisco lateral em cão – relato de caso

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A R T I C L E I N F O

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A B S T R A C T

Menisci are important intra-articular structures whose main function is attributed to load transmission and impact absorption, reducing biomechanical stress and providing greater osteoarticular stability. In dogs, knee-related disorders are described as the main causes of claudication. This report aims to describe a case of lateral meniscal lesion in a canine without signs of femorotibiopatellar instability, whose main change was claudication. The diagnosis was confirmed through orthopedic evaluation and magnetic resonance imaging, in which an anechogenic line of dissolution of meniscal continuity and intact ligament structures was visualized. As a treatment, the technique of total meniscectomy was chosen, which allowed the recovery of limb function and absence of clinical manifestations.

Palavras-chave:
Joelho
Claudicação
Meniscectomia

R E S U M O

Os meniscos são importantes estruturas intra-articulares cuja principal função atribui-se à transmissão de carga e à absorção de impacto, diminuindo o estresse biomecânico e conferindo maior estabilidade osteoarticular. Em cães, as afecções relacionadas ao joelho são descritas como as principais causas de claudicação. O presente relato tem como objetivo descrever um caso de lesão meniscal lateral em um canino sem sinais de instabilidade femorotibiopatelar, cuja principal alteração era claudicação. O diagnóstico foi confirmado através da avaliação ortopédica e exame de ressonância magnética, no qual foi visualizada uma linha anecogênica de dissolução de continuidade meniscal e estruturas ligamentares íntegras. Como tratamento, optou-se pela técnica de meniscectomia total, o que possibilitou o retorno da função do membro e ausência de manifestações clínicas.

INTRODUCTION

Menisci are intra-articular structures composed of circumferential bundles of collagen, presented in the dogs in a transversal form with a triangular shape covering half to two thirds of the joint surface of the corresponding tibial plateau, medially presenting larger dimensions with a polygonal shape and laterally circular (THIEMAN et al., 2009; FOX et al., 2015, DECAMP et al., 2016; VAQUERO-PICADO et al., 2018).

The main function of menisci is to transmit load and absorb intra-articular impact, besides increasing the congruence and the area of contact between the bones, decreasing the stress on the articular cartilage and playing a role in the absorption of shocks by measuring greater osteoarticular stability (JONES et al., 2006; FOX

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et al., 2015; VÉREZ-FRAGUELA et al., 2017, VALEN et al., 2017; VAQUERO-PICADO et al., 2018).

As weight bearing structures responsible for the transmission of load during knee movement, during extension, the tibiofemoral loads transmitted to the meniscus reach between 50% and 70%, in flexion they reach 85% to 90%, and during the impact of exercises such as jumping, walking and running, 20% of the stress load is transmitted to the joint (THIEMAN et al., 2009; VÉREZ-FRAGUELA et al., 2017). The combination of knee extension, flexion and rotation movements is facilitated by the morphological characteristics and mobility of the medial and lateral meniscus (VÉREZ-FRAGUELA et al., 2017).

Contrary to the occurrence in human beings, lesions of the meniscal cartilages in dogs and cats infrequently occur as primary injuries, and in almost all the cases they are the result of lesions associated to rupture alterations or ligament distension (DeCAMP et al., 2016). Cranial cruciate ligament rupture is recognized as the main risk factor for the injury (VALEN et al., 2017). Loss of meniscus function and inflammatory cytokines secondary to rupture can result in joint cartilage damage (THIEMAN et al., 2009; SIHVONEN et al., 2016; KRIER et al., 2018).

In human medicine, medial meniscal ruptures are more frequent than lateral lesions, corresponding to 81% and 19%, respectively (JONES et al., 2006; FOX et al., 2015). In veterinary medicine, as well as in human medicine, lateral ruptures are less frequent, and are rarely seen in isolation without knee instability (DeCAMP et al., 2016; VÉREZ-FRAGUELA et al., 2017).

Lesions in dogs are classified as longitudinal caudal rupture or bucket handle, incomplete longitudinal, double in bucket handle, radial, complex, degenerative “fringed”, transverse and congenital discoid lateral meniscus, with peripheral detachments or avulsions occurring (DeCAMP et al., 2016; MCCREADY et al., 2016; VALEN et al., 2017).

The main clinical manifestation in case of meniscus rupture is claudication, similar to cranial cruciate ligament rupture (CCLR), which may be associated with the presence of pain (DeCAMP et al., 2016; VÉREZ-FRAGUELA et al., 2017).

The diagnosis of the meniscus injury is raised as a suspicion through orthopedic evaluation in which there may be the Finochietto sign, which is a palpable or audible "click" during the movement of the joint generated by the displacement of the ruptured meniscus cranially and caudally between the femoral condyles and the tibia (HOULTON et al., 2006; VALEN et al., 2017; VÉREZ-FRAGUELA et al., 2017). However, the absence of such a sign does not exclude the injury (HOULTON et al., 2006).

Imaging tests are recommended for the definitive diagnosis of the lesion, and among them magnetic resonance imaging is the most used, with sensitivity and specificity of 93% and 88% for ruptures of the medial meniscus and 79% and 95% for the lateral (HOULTON et al., 2006).

The treatment of ruptures may vary according to the species in question, the location and presentation of the lesion, and includes conservative clinical treatment that demonstrates good results with the use of platelet rich plasma, meniscus repair that may include different suture techniques and materials, and partial or total meniscectomy (SCHULZ, 2014; FOX et al., 2015; DeCAMP et al., 2016; VÉREZ-FRAGUELA et al., 2017).

This report aims to describe a case of lateral meniscal lesion in a canine without signs of femoro-tibio-patellar instability, evidencing its clinical aspects, diagnostic method, and therapy instituted for the case.

CASE REPORT

A six-year old Border Collie dog with a body weight of 18 kg was treated in a clinic specialized in orthopedics and veterinary traumatology with the complaint of severe acute claudication of the left pelvic limb after jumping from a considerable height. The physical examination was within the normal range for the species and in the orthopedic examination the only change was the presence of a palpable "click" during the flexion and extension of the femoro-tibio-patellar joint without the presence of instability.

In front of the picture, the animal was referred to perform an ultrasound examination of the femoro-tibio-patellar joint, which revealed the presence of anechogenic globular areas in the cranial margin of the meniscus, followed by a line of dissolution of continuity of the same echogenicity in the caudal portion of this structure, suggesting possible meniscopathy. Also, by the same method, it can be evaluated that the medial meniscus presented decreased echogenicity in its ventral margin, suggesting an inflammatory process.

After the ultrasound findings, the patient was submitted to an evaluation by magnetic resonance imaging of the affected joint, whose method showed the presence of an amorphous area with T1 hypersignal and without contact with the caudal surface of the meniscus (Figure 1), configuring an intrameniscal lesion. Additionally, the presence of a slight accumulation of synovial fluid near the lateral portion of the joint capsule was observed, with no ligament changes and no visible bone changes.

The patient underwent general inhalation anesthesia with sevoflurane and epidural blockade using morphine (0.1mg/kg) and bupivacaine (0.1 mg/kg) for total lateral meniscectomy surgery. In the right lateral decubitus position, the affected pelvic limb was aseptically prepared. Through a lateral parapatellar arthrotomy and with the aid of self-static Gelpi retractors, it was possible

to inspect the femoro-tibio-patellar joint, location of the injured lateral meniscus, followed by its dissection from its insertions with the aid of scalpel blade No. 11 (Figure 2). Afterwards, the joint capsule synthesis was performed in Mayo pattern, followed by the subcutaneous in Cushing pattern, both using 25 (3-0) polyglecaprone suture, finished by simple dermorrhaphy interrupted with 3-0 mononylon.

Figure 1. Magnetic resonance scan of the left femoro-tibio-patellar joint. A) Sagittal cut image showing an amorphous area with T1 hypersignal and without contact with the caudal surface of the meniscus (arrow), configuring an intrameniscal lesion. B) Coronal image showing a slight accumulation of synovial fluid near the lateral portion of the articular capsule (arrow).

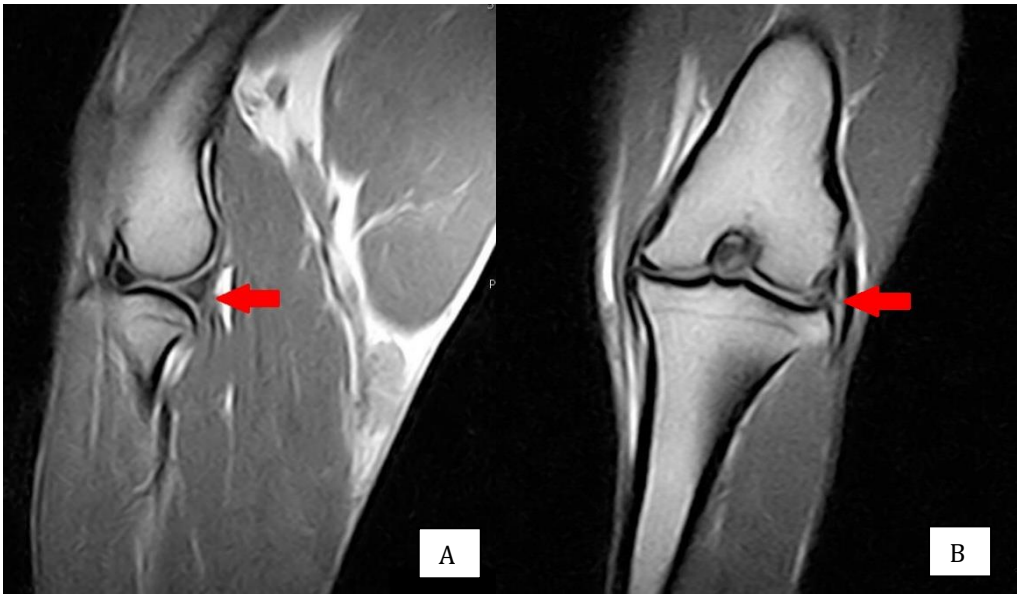
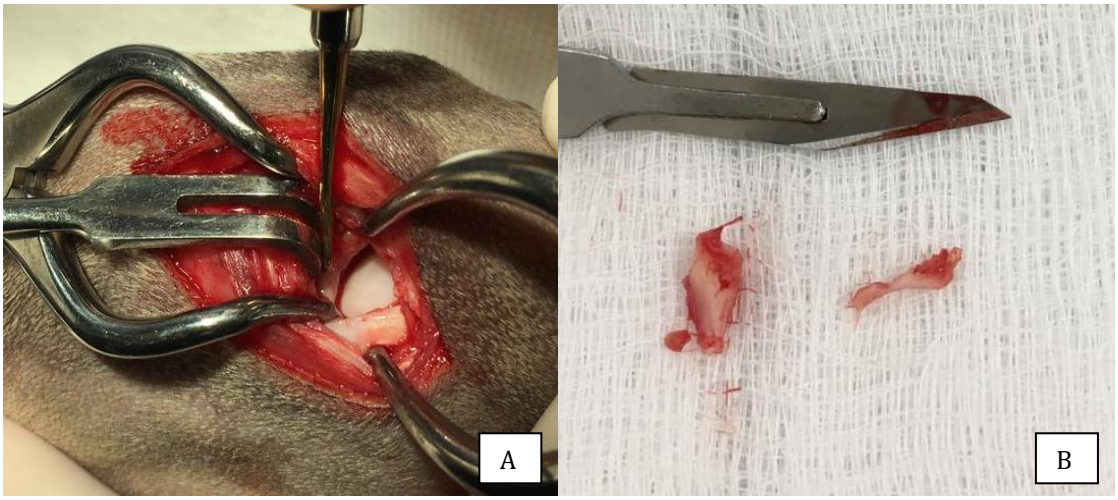


Figure 2. Total lateral meniscectomy technique. A) Arthrotomy and lateral meniscus exposure. B) Lateral meniscus after total resection.



The patient was discharged with the postoperative prescription of cephalexin (30 mg/kg every 12 hours), omeprazole (1 mg/kg every 24 hours), tramadol hydrochloride (5 mg/kg every 12 hours), dipyrone (25 mg/kg every 12 hours), carprofen (2.2 mg/kg every 12 hours), recommendation of cleaning of the surgical wound with 0.2% chlorhexidine-based antiseptic solution and rest.

The patient returned for reassessment after 15 days postoperatively, presenting complete clinical recovery with no claudication of the operated limb and no changes to the orthopedic examination, and was discharged from hospital.

DISCUSSION

Krier et al. (2018) suggested in their study that the complete lateral meniscal lesions are commonly isolated and present in dogs clinically similar to cranial cruciate ligament ruptures, in agreement to the reported in this case, in which the clinical manifestations were similar to the CCLR, and the suspicion of meniscal lesion appeared due to the absence of instability of the joint.

The presence of the palpable or audible "click" is one of the indications of meniscal injury; however, since this sign is not always present in all cases of the disease, it is

not considered as a pathognomonic finding (HOULTON et al., 2006; MCCREADY et al., 2016). Although not confirming or ruling out the lesion, the presence of this sign was described in the present case, contributing to the clinical suspicion.

As for diagnosis, radiography, ultrasonography and computed tomography examinations show low sensitivity in the identification of meniscus ruptures, and are limited only in the detection of secondary alterations to these lesions (HOULTON et al., 2006; FOX et al., 2015; MCCREADY et al., 2016; VALEN et al., 2017). Magnetic resonance imaging, in turn, has extreme precision in determining meniscal lesions in 82% to 95% of cases; however, arthroscopy is the gold standard technique for diagnosis of the disease (SCHULZ, 2014; FOX et al., 2015). Due to the unavailability of arthroscopy in most veterinary diagnostic centers, magnetic resonance imaging was requested in this case due to its great accuracy in recognizing osteoarticular disorders and greater availability of the examination, which ensured the definitive diagnosis of meniscal injury.

The inflammatory processes triggered by any aggression may generate secondary lesions to the menisci (HOULTON et al., 2006), in agreement with what was observed in the present case in which the medial meniscus presented alterations compatible with inflammatory lesions and whose development may have occurred secondary to the rupture of the lateral meniscus.

Vaquero-Picado et al. (2018) reported that meniscus changes may trigger early degenerative osteoarthritis. Schulz (2014) attributes the greater severity of joint disease mainly when meniscal disease is related to a cranial cruciate ligament rupture. In contrast to what was observed in the case described herein, no degenerative changes to the articular cartilage were observed by resonance imaging and during surgical inspection, which can be attributed to isolated meniscus rupture and preserved joint stability.

The main treatments in dogs are partial meniscectomy, which removes the affected fragment and total meniscectomy that corresponds to the resection of the whole perimeter of the meniscus (SCHULZ, 2014). The advantages of total meniscectomy include reduced risk of iatrogenic damage to the cartilage, more accurate excision in cases of fragmentation and removal of unobserved lesions, attributing to the technique good results for treatment of pain and claudication (DeCAMP et al., 2016), agreeing with the response presented by the patient in this study, whose surgical technique adopted enabled excellent recovery and absence of any clinical changes in the postoperative period.

Care during the surgical procedure is mainly related to avoiding iatrogenic damage to the ligaments and laceration of the articular cartilage (VÉREZ-FRAGUELA et al., 2017). In the postoperative period, attention should be focused on exercise restriction during the first six months so that there is regeneration of the meniscus before extreme tension is employed on the joint (DeCAMP et al., 2016).

CONCLUSIONS

Lateral meniscal rupture in the absence of knee instability is uncommon and may represent a diagnostic challenge due to the low incidence. Definitive diagnosis can be performed by several exams, and resonance imaging is often indicated by the greater ease of access when compared to arthroscopy and good sensitivity and specificity. The total meniscectomy in dogs presents good results in the treatment of the pain and claudication and it is the treatment of choice.

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