

CLINICAL AND THERAPEUTICAL ASPECTS REGARDING CROSSED LIGAMENTS RUPTURE IN DOG

Muste A., N. Mates, L. Oana, Fl. Beteg, C. Ober, Alina Donisa

University of Agricultural Sciences and Veterinary Medicine, 400372 Cluj-Napoca, Calea Mănăştur
no. 3-5, Cluj, Romania, E-mail:musteaurel@personal.ro

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Abstract. Crossed ligaments rupture is one of the most common orthopedic conditions seen in dogs, appearing in any breed at any age. Due to the particular anatomy of this area, spontaneous healing is not possible so the only alternative remains surgical correction. The purpose of this paper is that of presenting, putting into practice and comparing the results of several surgical methods used for the treatment of this condition.

MATERIAL AND METHODS

The study was conducted between 2004 and 2007, on dogs of different breeds, ages and size, presented at the Clinic of Surgical Patology from Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine from Cluj-Napoca (Table 1).. There were 11 dogs divided into two groups, depending on the surgical method used:

Group one – 5 dogs

Group two – 6 dogs

Tabelul 1. Casuistry studied

Nr. crt	Race	Build	Age	Year	Lot
1.	Caniche	Small	3 years	2005	1
2.	Rotweiller	Large	5 years	2006	1
3.	Cocker spaniel	Middle	5 years	2006	1
4.	Carpathian shepherd dog	Large	7 years	2007	1
5.	Rotweiller	Large	9 years	2007	1
6.	Cocker spaniel	Middle	5 years	2004	2
7.	Rotweiller	Large	6 years	2004	2
8.	Caniche	Middle	3 years	2004	2
9.	Rotweiller	Large	8 years	2005	2
10.	German shepherd dog	Large	5 years	2006	2
11.	Rotweiller	Large	3 years	2007	2

Intraarticular techniques were used in both groups – the modified Paatsama and the Over-the-top technique. The dogs diagnosed with this condition all presented claudication of different degrees; the affected limb was kept in extension while standing and in extension and turned to the exterior while sitting.

Palpatory exam is most relevant in such cases: both, tibial compression test and joint mobility test are positive.

The Patsama technique was used for the first group (five dogs). The patients were anesthetized using neuroleptanalgesia (Domitor and Ketamine), the surgery place was prepared by clipping the hair and applying local antiseptics followed by local analgesia. The surgery place is represented by the cranio-lateral zone of the hind knee, starting with the distal third of the thigh bone down to the proximal third of the shin bone.

The skin is incised lateral to the patella starting with the distal third of the thigh bone, down to the proximal third of the shin bone. Hemostasis is achieved through careful tamponment. The fascia lata and the patellar-tibial ligament are then cut, the articular capsule is incised, the leg is flexed to expose the articular space and the articular fatty tissue removed if necessary (fig. 1).



Fig.1. Removing of articular fatty tissue



Fig. 2. Preparing the allograft

The joint, joint cartilage, the meniscus and the ligaments are inspected. The edges of the ruptured ligament are cut off so that they do not disturb the joint. The allograft is then prepared by using the fascia lata as support. The joint is kept in normal physiologic position, two incisions are made on the fascia lata 1-2 cm apart, depending on the animal's size; this will be the width of the allograft.

A horizontal cut is made in the middle third of the femoral diaphysis, between the two cuts made previously, obtaining the superior edge of the allograft (fig.2). After complete removal of the graft, fatty tissue and excess muscle mass is removed and the graft is placed on a sterile material and washed with sterile saline solution. The joint is then flexed in a 90° angle creating a tunnel with oblique orientation starting from the femoral origin of the crossed ligament and ending at the proximal margin of the lateral femoral condyle (fig. 3).



Fig. 3. Realisation of an intercondylar tunnel



Fig. 4. Placing of graft using the conducting string

Using a conducting string (fig. 4), the graft is placed in and the joint is repositioned, so that when closed, the graft is stretched. The next step is suturing the graft to the surrounding tissue using absorbable thread.

For the second group (six dogs) the over-the-top technique was used, which also involves an allograft using the fascia lata. Preoperative management is similar as that for the previous group. The surgical technique begins with linear incision of the skin lateral to the patella, starting from the distal half of the thigh bone and ending in the proximal third of the shin bone. Fascia lata and the tibio-patellar ligament are then incised, followed by medial displacement of the patella. The articular capsule is opened in order to gain access to the joint and the fatty tissue and the ligament leftovers are removed.

The leg is placed in normal physiological position, using the fascia lata as support for the allograft (fig. 5).



Fig. 5. Superior delimitation of allograft



Fig. 6. Correct positioning of the allograft

Two incisions are made 1-2 cm apart depending on the animal's size, starting at the tibial tuberosity and ending in the middle third of the thigh bone. An intraarticular tunnel is formed starting from the dorso-lateral region of the lateral femoral condyle where an incision of 1 cm is made into the lateral vastus muscle. The joint is flexed and an opened forceps is pushed through the incision made in the previous step, orientated towards the center of the joint (fig. 6). The joint is repositioned so that the allograft is stretched (fig. 7) and then the

graft is sutured to the surrounding tissue: lateral vastus muscle, fascia lata and the patellar tendon (fig. 8).



Fig.7. Passaging of the allograft by tunnel



Fig.8. Suturing of the sectional tissues of the joint

A thorough lavage of the joint is performed in order to remove any blood clots or tissue remainings, after which the articular capsule is sutured. The other anatomical structures are sutured in such a way that the patellar dislocation performed earlier is mended. In the end the skin is sutured.

Antibiotics are given for three days, movements of the limb are limited for a period of three to four weeks, and gentle massage is performed after 7-10 days.

RESULTS AND DISCUSSIONS

It is important to mention that only in one of the dogs was surgery performed three days after the rupture, while in the remaining 10 cases it was performed in intervals varying from ten to twenty days after the accident. This is why some of the animals had locomotion problems and a delayed recovery since three of them were identified as suffering of first degree amyotrophy. In other two, superficial lesions and erosions of the articular cartilage were identified.

Local sensitivity and claudication resolved in 25-40 days. In middle and toy breed dogs surgery seems to be better tolerated, healing occurring in 30-35 days. There were no postoperative complications, full recovery being achieved in a 25 to 49 days interval.

Both methods assure good and durable stability of the joint after healing. Comparing the two, we can say that inflammatory response is less obvious in the over-the-top technique. One explanation is that less trauma is made by tunneling using the over-the-top technique.

CONCLUSIONS

Both methods offer very good results if proper surgical steps are carefully followed.

Complete recovery is influenced by many factors like: size, weight and the time passed between the rupture and the surgery.

In our cases complete recovery occurred after 25 to 35 days.

Medication, physiotherapy and massage was used for the three dogs with muscular amyotrophy .

No postoperative complications were identified in our study.

BIBLIOGRAPHY

1. Arnoczky SP, 1990, The anterior cruciate ligament. Proceedings of the 98 th Annual Meeting of the American Animal Hospital association, 321-326.
2. Arnoczky SP, Torzilli PA, Marshall JL, 1977, Evaluation of anterior cruciate ligament repair in dog: an analysis of the instant center of motion. J Am Anim Hosp Assoc, 13-553.
3. Muste A, 2006, Ingrijirea, cresterea si patología animalelor de companie, Ed. Mediamira.
4. Newton C., Nunamaker D.,1985, Textbook of Small Animal Orthopaedics, JB Lippincott Company.
5. Petersen W., Tillmann B, 1999, Structure and vascularisation of the knee joint menisci, Z Orthop 44.
6. Simkin PA, 1991, Physiology of normal and abnormal synovium. Semin Arthritis Rheum.
7. Stocchi R, V de Pasquale, Gubellini P.,1992, The human anterior cruciate ligament: histological and ultrastructural observations.