SURGICAL MANAGEMENT OF ANTERIOR CRUCIATE LIGAMENT RUPTURE USING MODIFIED FASCIA LATA TECHNIQUE IN A DOG

ROHIT KUMAR*, M.A. SHAH, M.A. BASHA, H.P. AITHAL, A.C. SAXENA, AMARPAL, P. KINJAVDEKAR, M. SINGH and N. KUMAR

Division of Surgery, Indian Veterinary Research Institute, Izatnagar, Bareilly-243122, India

Received: 20.04.2019; Accepted: 08.05.2019

SUMMARY

A three-year-old female mongrel weighing 15 kg was presented to the Referral Veterinary Polyclinic with the history of fall from a height. Radiography did not reveal any bony abnormality. Clinical examination revealed severe lameness in left hind limb with prominently visible anterior drawer sign. The animal was subjected to magnetic resonance imaging (MRI) to confirm the extent of injury of anterior cruciate. A ruptured anterior cruciate ligament (ACL) was diagnosed on MRI. ACL was repaired with intra-articular modified fasialata technique under general anaesthesia. Animal showed excellent recovery without any sign of lameness.

Keywords: Anteroir cruciate ligament, Fascia lata, Lameness

The canine stifle is a complex, condylar, synovial joint and is composed of three interrelated articulations: the condyloidfemoro-tibial, the femoro-patellar, and the proximal tibio-fibular (Robins, 1990). Anterior cruciate ligament (ACL) injury is a leading cause of degenerative joint disease (DJD) in the canine stifle (Elkins *et al.*, 1991). The function of the ACL is to limit the cranial translation of the tibia in relation to the femur as well as to restrict the internal rotation of the tibia (Arnoczky and Marshall, 1977). As ACL is the main stabilizing structure of the stifle joint, its rupture results in mild to severe lameness depending on the extent of the damage (Slocum and Devine, 1993). The present study reports the successful surgical management of ACL rupture using intra-articular modified fasialata technique in a mongrel dog.

A three year old female mongrel dog weighing 15 kg was presented with the history of fall from a height. Clinical examination revealed severe lameness in left hind limb with prominently visible anterior drawer sign. Radiography did not reveal any bony abnormality. The animal was subjected to magnetic resonance imaging to confirm the diagnosis and to assess the extent of injury of anterior cruciate ligament (Fig. 1). A ruptured ACL was diagnosed and it was decided to repair the ruptured cruciate ligament with intra-articular modified fasialata technique. The animal was prepared aseptically and premedicated with atropine 0.04 mg/kg (IM), butorphanol 0.2 mg/kg, IV and midazolam 0.2 mg/kg, IV. Induction of anaesthesia was achieved with 5% thiopentonesodium till effect and anaesthesia was maintained with isoflurane in 100% oxygen. The stifle was approached through a lateral parapatellar skin incision that extended from the proximal third of the femur to the level of the tibial tuberosity. The fascia lata was then incised to create a strip of about 1 cm

width (Fig. 2). A hole was drilled in the femur using a 2.5 mm drill bit. The stifle was flexed to 90° and the bit was introduced obliquely into the intercondylar notch to enter at the femoral origin of the cranial cruciate ligament and exit just lateral to the proximal end of the lateral trochlear ridge (Fig. 3). The drilled hole was extended through the joint capsule and distal fibres of the vastuslateralis muscle. The fascial graft was passed through the femoral tunnel with the help of a wire loop, with the limb in a functional position (Fig. 4). Patella was placed over the trochlea of femur and stifle joint was closed using vicryl (No. 1). The fascialata strip was pulled through the parapatellar incision and secred over the joint using polyamide (No. 1) (Fig. 5). Following routine closure of the joint capsule and skin, the limb was immobilized with Robert Jones bandaging for 3 weeks (Fig. 6). Postoperative antibiotic treatment was constituted using Ceftriaxone 20 mg/kg, IM for seven days, Meloxicam 0.2 mg/kg, IM for three days. Suture line was dressed daily with povidone iodine. Skin sutures were removed on 11th postoperative day. Postoperative follow up was taken up to two months and animal showed excellent recovery without any sign of lameness.

Diagnosis of canine ACL rupture is usually easily confirmed on physical examination. Drawer motion is pronounced in most affected canines (Vasseur *et al.*, 1985; De Rooster and Van Bree, 1999). Intra-articular stabilization techniques include use of autografts, allografts, xenografts, and synthetic materials to replace the affected ACL (Tonks *et al.*, 2010). In most dogs, despite the surgical technique chosen, osteoarthritic changes progress after ACL surgery (Hoffmann *et al.*, 2006; Au *et al.*, 2010) and this may cause deterioration of the dog's clinical condition later in life. However, the use of autogenous material like fascia lata has long been advocated for anatomical replacement of the cranial cruciate ligament.

^{*}Corresponding author: drrohits.singh@gmail.com



Fig. 1. Arrow depicting ruptured ACL

Fig. 2. Thin strip of fascia lata to be used as graft

Fig. 3. Drilling a hole through intercondylar notch to femoral origin of ACL







Fig. 4. Passing fascia lata strip through the tunnel Fig. 5. Fascialata strip secured to the fascial Fig. 6. Limb secured with heavy Robert-Jones incision over the joint bandaging postoperatively for 3 weeks

Studies show that physical rehabilitation can speed a dog's recovery and may improve final outcome regardless of the surgical technique chosen (Lazar et al., 2005). In the present case, modified fascia lata technique described by Dcikinson and Nunamaker has been used. Animal showed excellent recovery without any lameness. It is therefore, concluded that intra articular modified fascia lata technique (Dickinson and Nunamaker, 1977) can be used effectively for the management of anterior cruciate ligament rupture in dogs.

REFERENCES

- Arnoczky, S.P. and Marshall, J.L. (1977). The cruciate ligaments of the canine stifle: An anatomical and functional analysis. Am. J. Vet. Res. 38:1807-1814.
- Au, K.K., Gordon-Evans, W.J., Dunning, D., O'Dell-Anderson, K.J., Knap, K.E., Griffon, D. and Johnson, A.L. (2010). Comparison of short- and long-term function and radiographic osteoarthrosis in dogs after postoperative physical rehabilitation and tibial plateau leveling osteotomy or lateral fabellar suture stabilization. Vet. Surg. 39:173-180.
- De Rooster, H. and Van Bree, H. (1999). Popliteal sesamoid displacement associated with cruciate rupture in the dog. J. Small Anim. Pract. 40(7): 316-318.
- Dickinson, C.R. and Nunamaker, D.M. (1977). Repair of ruptured anterior cruciate ligament in the dog: Experience of 101 cases

using amodified fascia strip technique. J. Am. Vet. Med. Assoc. **170**: 827-1977.

- Elkins, A.D., Pechman, R. and Kearney, M.T.(1991). A retrospective study evaluating the degree of degenerative joint disease in the stifle joint of dogs following surgical repair of anterior cruciate ligament rupture. J. Am. Anim. Hosp. Asso. 27(5): 533-540.
- Hoffmann, D.E., Miller, J.M., Ober, C.P., Lanz, O.I., Martin, R.A. and Shires, P.K. (2006). Tibial tuberosity advancement in 65 canine stifles. Vet. Comp. Orthop. Traumatol. 19: 219-227.
- Lazar, T.P., Berry, C.R., Dehaan, J.J., Peck, J.N. and Correa, M. (2005). Long-term radiographic comparison of tibial plateau leveling osteotomy versus extracapsular stabilization for cranial cruciate ligament rupture in the dog. Vet. Surg. 34: 133-141.
- Robins, G. (1990). The canine stifle joint. In: Canine Orthopedics. W.G.Whittick (Edt.), 2nd Edn. Lea & Febiger, Philadelphia. pp. 693-760.
- Slocum, B. and Devine, S. T. (1993). Tibial plateau leveling osteotomy for repair of cranial cruciate ligament rupture in the canine. Vet. Clin. North Am.: Small Anim. Pract. 23(4): 777-795.
- Tonks, C.A., Pozzi, A., Ling, H.Y. and Lewis, D.D. (2010). The effects of extra-articular suture tension on contact mechanics of the lateral compartment of cadaveric stifles treated with the tightrope CCL or lateral suture technique. Vet. Surg. 39(3): 343-349.
- Vasseur, P.B., Pool, R.R., Arnoczky, S.P. and Lau, R.E. (1985). Correlative biomechanical and histologic study of thecranial cruciate ligament in dogs. Am. J. Vet. Res. 46(9): 1842-1854.