

**TREATMENT OF BILATERALLY MULTIPLE STIFLE LIGAMENT INJURY  
USING TRANSARTICULAR PIN APPLICATION IN A CAT**  
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**Abstract:**

The purpose of this case report is to share the results of treatment of bilateral multiple ligament injury in a street cat brought to the Ankara University Faculty of Veterinary Medicine Small Animal Hospital Surgery Clinic which had inability to use its hindlimb after a traffic accident. As a result of clinical and radiographic assessments, both anterior and posterior ligaments and medial collateral ligaments were broken in both extremities; Intraoperatively, total separation was determined on the left extremity and lateral meniscus. The treatment of the case was performed with temporary intraoperative transarticular pin application and clinical improvement was achieved at an acceptable level.

**Key words:** *Cat, Joint, Stifle, Ligament, Rupture, Transarticular pin.*

**Introduction:**

Multiple ligament injuries in the knee joint are formed as a result of trauma that exposes the knee joint to torsional and extreme outward bending forces such as traffic accidents, high dropping or jumping from one place to another. Depending on the severity of the trauma, multiple ligament injuries such as anterior cruciate ligament, posterior cruciate ligament, lateral and medial collateral ligament fractures, as well as damage to surrounding tissues such as meniscus, joint capsule, tendons and muscles may occur (Bruce, 1998).

In such cases, the purpose of the treatment is to limit the damage to the joint surface by preventing abnormal movements, bringing the joint to its normal anatomical position, and regenerating joint stability to provide the normal range of motion. For this purpose, in previous studies; Transarticular pin application (Connery and Rackard, 2000; Robins, 1990; Welches and Scavelli, 1990; Hoffman et al. 1985; Keeley et al. 2007), transarticular external skeletal fixator application (Bruce, 1999), endoprosthesis ( Bruce 1998; Aron, 1988; Hulse and Shires, 1986; Toombs and Wallace, 1979; Swanwick, 1987) and arthrodesis (Hoffman et al. 1985) were performed.

**Material and Method:**

The patient is male, one year old a street cat brought to the Ankara University Faculty of Veterinary Medicine Small Animal Hospital Surgery Clinic which had inability to use its hindlimb after a traffic accident. As a result of clinical and radiographic assessments, both

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anterior and posterior ligaments and medial collateral ligaments were broken in both extremities (Figure 1).

The case was fasted for 12 hours before the operation, The cat was sedated with Butorphanol ( 0.2 mg/kg IM) and Medetomidine (80 mcg/kg IM), induce with Ketamine (11 mg/kg IM). Cefazolin sodium (25 mg/kg IV) an hour before operation and Amoxicillin (12,5 mg/kg BID) 10 days after the operation were administrated as antibiotic. As analgesic, Meloksikam (0.3 mg/kg SC) 3 days postoperatively were administered.

The knee joint was reached in each knee using the standart surgical procedure and the anterior and posterior ligament pieces were removed from the joint and the medial collateral ligament was repaired with 2-0 silk thread. The integrity of the meniscus was checked and the total separation on the lateral meniscus of the left extremity was determined and the meniscus was removed (Figure 2). Subsequently, the joints were fixed in a normal anatomic position with transarticular pin application made from the tibia to the femur (Figure 3). The joint capsules were closed with capsuloraphy and the subcutaneous and skin tissues were closed with standard surgical procedure. Bandages were applied to the left extremity postoperatively. The bandage was removed on the 10th day, and the transarticular pins applied on the 30th day.



Figure 1. Preoperative radiographs.

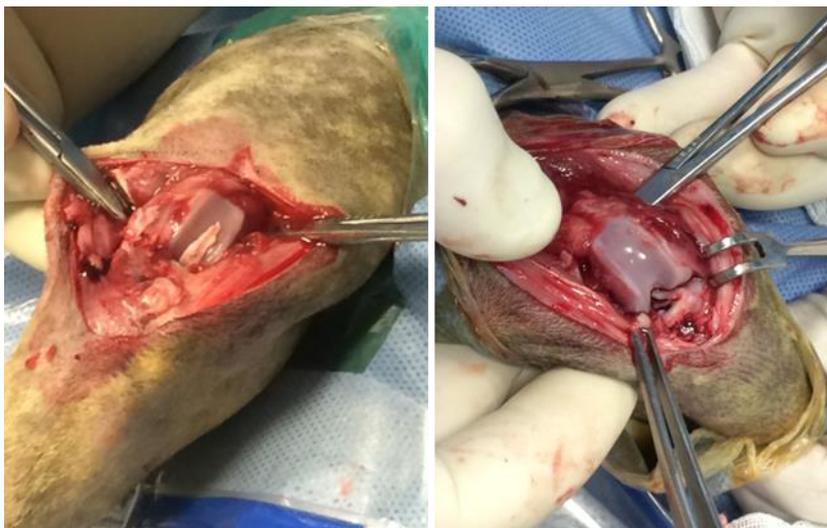


Figure 2. Intraoperative images. Ruptured anterior ligament (left), Separated lateral meniscus (right).



Figure 3. Postoperative radiographs

### Results:

The case was clinically and radiologically controlled at postoperative 10, 20, 30 and 60th days. On the 10th day of the clinical examination revealed that he was reluctant to move but could move on the posterior limbs. It was observed that the disease was clinically better at the 20th day control and no changes were observed radiologically. On the 30th day clinical examination showed that the knee joints could be moved and the pain was accompanied by movement. As a result of the radiographic examination, it was determined that the pins were migrated and then the pins were removed (Figure 4). On the 60th day of the clinical examination, both extremities were actively accepted at acceptable level (Figure 5).

In this case, temporary transarticular pin application provided adequate joint

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immobilization, resulting in periarticular fibrous tissue formation and joint stability, and an acceptable improvement was observed.



Figure 4. Postoperative 30th day examination, pin migration.

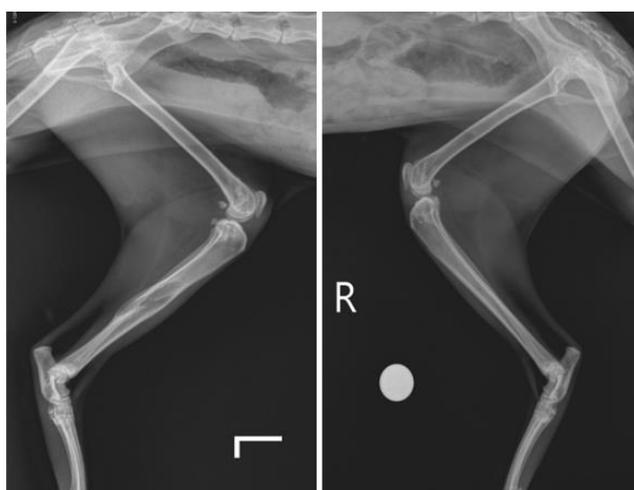


Figure 5. Postoperative 60th day examination.

### Discussion:

Transarticular pin application was first applied in 1985 (Hoffmann et al. 1985) and successful results were reported (Cornery and Rackard, 2000; Welches and Scavelli, 1990). This application aims to fix the joint in its normal anatomical position until fibrous tissue is formed at a level that will prevent joint relapse in periarticular soft tissue. But the greatest disadvantage has been reported to be immobilization of the implant for a sufficient period of time due to migration or breakage of the implant.

Transarticular pin application was considered to be a suitable technique for short-term immobilization, but as a result of this application, reduced fluidity of joint fluid, reduced

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cartilage tissue thickness and hardness and reduced range of motion of the joint were observed (Jaeger et al. 2005).

The most successful treatment method of multiple ligament injuries is reported as complete repair of joint structures damaged by open reduction and it is stated that short-term mobilization of joints is achieved by this method and muscle atrophy is prevented and joint movement is provided rapidly (Bruce, 1999).

### References:

1. **Bruce WJ.** (1998). Multiple ligamentous injuries of the canine stifle joint: a study of 12 cases. *J Small Anim Pract.* 39: 333-340.
2. **Aron DN.** (1988). Traumatic dislocation of the stifle joint: treatment of 12 dogs and one cat. *J Am Anim Hosp Assoc.* 24: 333-340.
3. **Hulse DA, Shires PK.** (1986). Multiple ligament injury of the stifle joint in the dog. *J Am Anim Hosp Assoc.* 22: 105-110.
4. **Toombs JP, Wallace LJ.** (1979). Surgical management of multiple ligamentous injuries of the feline stifle joint: case report. *Vet Surg.* 8: 34-37.
5. **Swanwick A.** (1987). Bilateral dislocation of the stifle joint in two cats. *Aust Vet Pract.* 17: 190-194.
6. **Bruce WJ.** (1999). Stifle joint luxation in the cat: treatment using transarticular external skeletal fixation. *J Small Anim Pract.* 40: 482-488.
7. **Cornery NA, Rackard S.** (2000). The surgical treatment of traumatic stifle disruption in a cat. *Vet Comp Orthop Traumatol.* 13: 208-211.
8. **Robins GM.** (1990). The canine stifle joint. In: *Canine Orthopaedics*, 2<sup>nd</sup> ed. Wittick WG (ed). Philadelphia: Lea & Febiger. 693-760.
9. **Welches CD, Scavelli TD.** (1990). Transarticular pinning to repair luxation of the stifle joint in dogs and cats: a retrospective study of 10 cases. *J Am Anim Hosp Assoc.* 26: 207-214.
10. **Hoffmann GT, Lipowitz AJ, Herron MR et al.** (1985). Clinical Forum: Concomitant rupture of the collateral and cruciate ligaments. *Feline Pract.* 15: 433-434.
11. **Keeley B, Glyde M, Guerin S, Doyle R.** (2007). Stifle joint luxation in the dog and cat: The use of temporary intraoperative transarticular pinning to facilitate joint reconstruction. *Veterinary and Comparative Orthopaedics and Traumatology (VCOT)*, 20(3): 198-203.

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12. **Jaeger, GH, Wosar, MA, Marcellin-Little, DJ, Lascelles, BDX.** (2005). Use of hinged transarticular external fixation for adjunctive joint stabilization in dogs and cats: 14 cases (1999–2003). *Journal of the American Veterinary Medical Association*, 227(4), 586-591.