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Surgical correction of Grade IV lateral patellar luxation in a Chippiparai dog

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Abstract
A seven-year-old intact male Chippiparai dog was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal, with a history of right hind limb lameness and intermittent weight-bearing. On Clinical examination lateral luxation of the right patella was noticed. A Grade IV lateral patellar luxation diagnosis was made based on the results of the physical and radiographic examinations. A cranio-lateral incision was made to approach the stifle joint. Following tibial wedge resection sulcoplasty, the tibial tuberosity was transposed slightly medially from its pre-existing position and secured with K-wire. After surgery, a crepe bandage was used to immobilize the stifle joint. Antibiotics and analgesics were administered orally for a week and skin sutures were removed after 14 days postoperatively. The dog's recovered without any complications.

Keywords: Patellar luxation, trochlear wedge resection sulcoplasty, tibial tuberosity transposition

Introduction
Patella, a large triangular sesamoid bone that articulates with the trochlea of the femur, provides increased leverage to the leg extensors. The displacement of the patella from the trochlear sulcus, known as patellar luxation, can happen medially or laterally. In addition to angular and torsional abnormalities of the femur and tibia, patellar luxation has been linked to a number of macroscopic morphological malformations, such as incorrect coxofemoral conformation, hip dysplasia, and a shallow trochlear groove (Piermattei *et al*., 2006) [4]. Although medial patellar luxations can occur in dogs of any breed, age, or sex, they are more common in small and toy breeds. Larger dog breeds are more likely than tiny and toy breeds to exhibit lateral patellar luxations (Fossum, 2019) [1]. Although the route of inheritance has never been established, the majority of patellar luxations are congenital and unquestionably inherited (Roush, 1993) [5].

Case History and Diagnosis
A seven-year-old intact male Chippiparai dog was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal, with a previous history of hip dysplasia and present history of intermittent, weight-bearing lameness and occasionally holding the right hind limb in a flexed position while walking. Physical examination revealed an inability to fully extend the stifle joint, along with a laterally luxated patella. Radiographic examination confirmed the lateral patellar luxation (Figure 1). All physiological parameters were found to be within normal limits. History, physical examination, and radiographic findings aided in diagnosing the condition as grade IV lateral luxation of the patella in the right hind limb. Trochlear wedge resection sulcoplasty (TWRS) and tibial tuberosity Transposition (TT) were chosen as the surgical corrective methods.

Treatment
As premedication, Atropine sulphate (0.02 mg/kg body weight) was administered subcutaneously, and Xylazine hydrochloride (1 mg/kg body weight) was administered intramuscularly. General anaesthesia was induced intravenously using Ketamine.

(5 mg/kg body weight) and Diazepam (2 mg/kg body weight) and maintained with 2% isoflurane. The surgical site was prepared aseptically, and a craniolateral incision was made on the right stifle to access the joint capsule. The joint capsule was opened, and the trochlear groove was deepened using trochlear wedge resection sulcoplasty (Figure 2). The trochlear block was replaced after deepening the groove. Later medial transposition of tibial tuberosity was done to align the patella and patellar tendon in the axial plane of the femur and tibia. 2 mm Kirschner wire was used for stabilizing the tibial tuberosity (Figure 3). Muscle and skin were sutured as per standard protocol. Postoperatively Tab. Amoxicillin and clavulanic acid (10 mg/Kg body weight) twice daily for a week. Tab. Tramadol (2 mg/Kg body weight) was administered orally for three days and joint supplements were advised for 4 weeks. To reduce swelling, decrease pain and prevent self-trauma to the incision soft-cotton bandage was advised for 14 days. After six weeks, the dog recovered well and was able to bear his own weight. After 4 weeks post-operatively, mild flexion and extension exercises of the stifle joint were performed to restore its normal range of motion.

Results and Discussion

One of the most common orthopaedic disorders in dogs is canine patellar luxation due to its potential to cause lameness, osteoarthritis, and pain (Neill *et al*., 2016) [3]. Dogs of any breed, age, and sex can experience medial patellar luxation, but small and toy breeds are more commonly affected (Fossum, 2019) [1]. In contrast, lateral patellar luxation is more commonly seen in large breeds. Although the exact cause is uncertain, it is thought to be connected to a shifted force generated by the pull of the quadriceps lateral to the longitudinal axis of the femur and trochlear groove. The patella gets displaced from the trochlear sulcus by this aberrant lateral force. Concurrent abnormalities associated with the hip may also contribute to patellar luxation due to laxity in the quadriceps mechanism as seen in this case (Fossum, 2019) [1]. Skyline and mediolateral views assist in diagnosis. When compared to non-surgical management, surgically treated cases typically show better outcomes. In large-breed dogs, procedures such as femoral trochleoplasty, tibial tuberosity transposition, and soft tissue tightening or release yield more favourable results (Gibbons *et al*., 2006) [2].

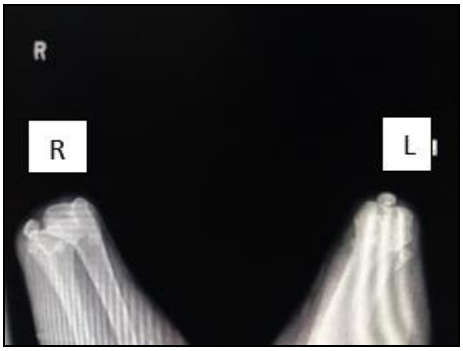

Fig 1: Lateral patellar luxation of right hind limb

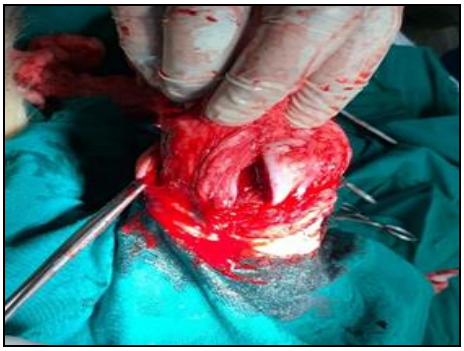

Fig 2: Trochlear wedge resection sulcoplasty

Fig 3: Tibial tuberosity transposition stabilized with 2mm k wire

Conclusion

This study showcases the successful surgical management of Grade IV lateral patellar luxation in a Chippiparai dog. The combined approach of trochlear wedge resection sulcoplasty and tibial tuberosity transposition proved effective, ensuring stable patellar positioning. As a result, the dog achieved a smooth recovery with restored weight-bearing ability on the affected limb.

Conflict of Interest

Not available

Financial Support

Not available

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