CASE REPORT

Surgical Management of Patellar Luxation in a Dog

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In dogs, patellar luxation is a common orthopedic problem. The luxation can be lateral, medial, or bidirectional. Medial and lateral luxation is usually diagnosed in small-breed and giant breed dogs, respectively (Bosio *et al.,* 2017). Patellar luxation is the result of various anatomic abnormalities involving the entire hind limb. The absence of the physiological pressure on the articular cartilage of the trochlear groove due to chronically luxated patella during growth may prevent the development of an adequately deep and wide groove (trochlear hypoplasia) (Lavrijsen *et al.,* 2014). The correction of the luxation can be accomplished through the use of both soft tissue and osseous surgical methods or a combination of more than one procedure (Harsen, 2006). Soft tissue procedures include lateral imbrications, antirotational sutures and medial desmotomy. These techniques can be performed on immature individuals to reduce aberrant forces on growing bones and on mature patients to support bony procedures (Di Dona *et al.,* 2018). Bony procedures include Tibial tuberosity transposition, Corrective osteotomies and Deepening of the trochlear groove by abrasion trochleoplasty, trochlear chondroplasty, wedge and block recession trochleoplasty. The goal of the repair is to repose the tendon's insertion between the patella and tibia in order to create a trochlear groove that is deep and wide enough to embed about 50% of the patella above the trochlear ridges (Talcott *et al.,* 2000).

Case History and Observations

A thirteen months old male Labrador weighing 21 kg was brought to Veterinary Clinical Complex, Lala Lajpat Rai University of Veterinary and Animal Science, Hisar, Haryana (India) with the history of improper weight bearing and lameness in the right hind limb since three months. The physiological parameters, *viz.* heart rate, respiration rate and temperature were within normal range. On physical examination mild weight bearing lameness with intermittent lifting of the limb was observed. On clinical examination patella was found to be medially deviated and deviation of tibial tuberosity along with limb torsion or angulation was palpated. Patellar luxation was classified as fourth grade. Survey radiograph in skyline view revealed medial deviation of patella (Fig. 1).

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Treatment and Discussion

The site over the affected stifle joint was prepared aseptically for the surgery. The dog was anaesthetized with balanced anaesthetic protocol using atropine @ 0.04 mg/kg i.m. for premedication and xylazine @ 1 mg/kg i.m. for sedation. Induction was done with propofol @ 4 mg/kg i.v. Maintenance of anaesthesia was done with isoflurane @ 1-2 % with oxygen with flow rate of 50 mL/kg. Dog was put on lateral recumbency keeping affected limb upward. Trochlear wedge recession and tibial tuberosity transposition were performed for surgical correction of the luxation. Skin incision was given on medial aspect of stifle joint. After incising the fascia joint capsule was opened. An elliptical wedge of cartilage and subchondral bone from the trochlear groove was removed, groove was deepened and then the wedge was replaced in the newly deepened groove (Fig. 2). Tibial tuberosity transposition (TTT) involved osteotomy of the insertion of the patellar tendon along with a portion of the tibial tuberosity and lateral transplantation of this bone fragment to realign the quadriceps-patella-patellar tendon mechanism in a straight line with the help of two pins along with a figure-8

tension band wire (Fig. 3, 4). A soft-padded bandage was applied to reduce swelling, decrease pain, and prevent self-trauma to the incision. Owner was advised for restricting the activity of dog for 6-8 weeks. Dog started weight bearing after two months of surgery and recovered uneventfully.

Although bilateral luxation may be a frequent finding, majority of the affected dogs show unilateral luxation (Arthurs and Langley, 2006). In the present case study, the dog was 13 months old Labrador with right side patellar luxation. Young dogs frequently suffer from patellar luxation, and lameness is shown as the dog grows. Because of this, the majority of luxations are discovered usually within 3 years of age (O'Neill *et al.,* 2016). Patellar luxation was found to be of fourth grade as patella could not be repositioned manually and slight angulation of tibia was also present. Patellar luxation in dogs has been graded into grade I to IV. If the patella can be manually luxated, but it returns to its original position on its own after removal of manual pressure, Grade I; If there is luxation of patella on manual mainupulation and it stays luxated until stifle extension or manual replacement done, Grade II; If there is persistent luxation of patella and manual replacement can be done, but it will reluxate on its own if manual pressure is released, Grade III; and If the patella is permanently luxated and cannot be repositioned manually, Grade IV (Di Dona *et al.,* 2018).

Medial patellar luxation was seen in the present case. The incidence of medial patellar luxation in small breed dogs is 12 times higher in comparison to large breed dogs (Di Dona *et al.,* 2018). For patellar luxations that are Grades 1, 2, or 3, the prognosis following surgical repair is usually favourable (Harsen, 2006). Grade 4 luxations in middle-aged to older dogs have more uncertain prognosis, however even these conditions can be managed surgically. Reluxation is the most frequent post-operative complication seen in 50% of patients (L'Eplattenier and Montavon, 2002). In the present case, no reluxation was observed. Besides the presence of reluxation

Fig. 1: Radiograph (SKY line view) showing medial luxation of patella

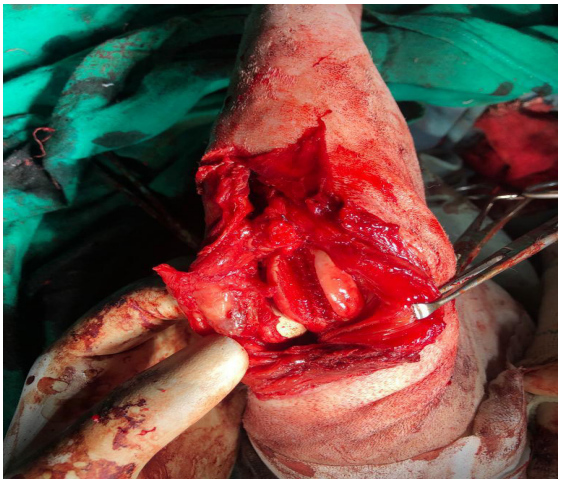

Fig. 2: Trochlear wedge recession technique showing deepening of trochlear groove

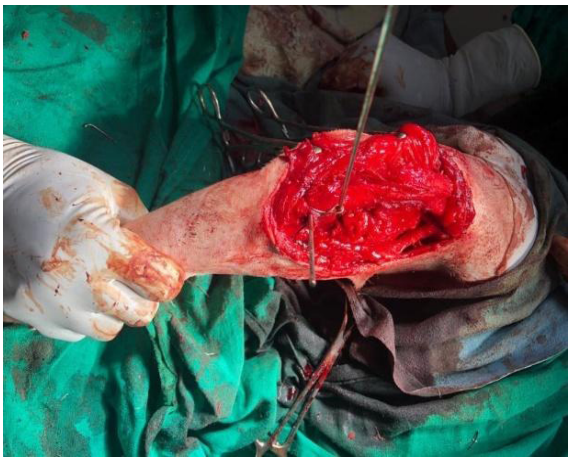

Fig. 3: Photograph showing tibial tuberosity transposition surgical technique

Fig. 4: Post-operative lateral radiograph showing lateral transposition of tibial tuberosity and its fixation with the help of two pins along with a figure-8 tension band wire

seroma formation, infection and periodic lameness may also be observed (Arthurs and Langley, 2006).

In brief, in small breed dogs, patellar luxation is very common and one of the main causes of hind limb lameness and the early onset of osteoarthritis in the canine stifle joint. An early diagnosis is crucial to improve the prognosis and livability of dog.

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