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## Surgical management of bilateral lateral luxation of patella in a Doberman dog: A case report

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### Abstract

A one-year-old male Doberman was presented to Small Animal Surgery Unit of Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu with the history of non-weight bearing lameness in both the hind limbs since birth. Physical examination and radiographic evaluation revealed lateral luxation of patella in the both the hind limbs. The case was confirmed as congenital bilateral lateral luxation of patella and surgical correction through trochlear wedge recession sulcoplasty with tibial tuberosity repositioning was performed in both the legs under general anaesthesia as staged procedure. Post operative radiography revealed patella in normal position. Recovery was good and improvement in gait noticed on 14<sup>th</sup> post operative day and the animal made an uneventful recovery.

**Keywords:** Lateral luxation of patella, trochlear wedge recession sulcoplasty, tibial tuberosity repositioning, general anaesthesia

### Introduction

Patellar luxation is one of the most common causes of lameness in the dog. Both large and small breed dogs may be affected; the disease may be seen in cats as well. (Nunamaker DM, 1985) <sup>[11]</sup>. The luxation can be medial, lateral or bidirectional (Ness *et al.* 1996) <sup>[10]</sup>. Patellar luxation is an intermittent or permanent displacement of patella from the trochlear sulcus. Most luxation are termed 'congenital' because they occur in early life and not associated with trauma (DeAngelis M, 1996) <sup>[3]</sup>. Lateral luxation occurs less frequently and is commonly diagnosed in large or giant breed dogs (Linney *et al.* 2011) <sup>[9]</sup>. The reported incidence of medial patellar luxation in small breed dogs is 12 times higher compared with large breed dogs (Roush JK, 1993) <sup>[12]</sup>. The patellar luxation is related to the anteversion or coxa valga of the coxo-femoral joint, which shifts the line of force produced by the pull of quadriceps lateral to the longitudinal axis of the trochlear groove. This abnormally directed force pulls the patella from the trochlear sulcus (Bosio, F. 2017) <sup>[2]</sup>. Tibial deformities seen with patellar luxation were the result of abnormal forces acting on the proximal and distal physis of tibia. These include lateral displacement of tibial tuberosity and lateral torsion of distal tibia (Hayes AG *et al.*, 1994) <sup>[6]</sup>. A system of classifying patellar luxation into four grades has been developed. In grade I, spontaneous luxation of patella during normal joint motion occurs but the patella reduces when the pressure is released. In grade II, angular and torsional deformities of femur occur to mild degree and the patella remains luxated until it is manually reduced. In grade III, patella is permanently luxated and can be reduced manually. In grade IV, patella is permanently luxated permanently and it cannot be reduced manually. Abnormalities of supporting soft tissues of stifle joint and femur are notable. Clinical signs may vary from animal to animal. Lameness may be intermittent or continuous, mild to moderate weight bearing lameness in grade III, non-weight bearing lameness and crouched position of rear quarters in grade IV (LaFond E. *et al.*, 1994) <sup>[8]</sup>. Radiography reveals laterally displaced patella from the trochlear groove. Surgical treatment is Trochlear Wedge Recession Sulcoplasty (TWRS) with Tibial tuberosity transposition (LaFond E. *et al.* 2002) <sup>[8]</sup>. This case report describes about a clinical case of a dog with bilateral lateral patellar luxation and its surgical management.

### Case history

A one-year-old male Doberman was presented to Small Animal Surgery Unit of Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu with the history of non-weight bearing lameness in both the hind limbs since birth.

### Diagnosis

Physical examination revealed the patella was luxated laterally away from the trochlear groove and cannot be reduced. Skyline and lateral radiographs of both the patella confirmed the case as Grade IV congenital lateral luxation of patella (Figure 1). The haematological and biochemical values were normal.

### Materials and Methods

The food and water were withdrawal for 24 and 12 hours respectively before the day of surgery. The animal was premedicated using Inj. Atropine sulphate @ 0.02mg/kg s.c. and Inj. Xylazine @ 1mg/kg i.m. and Inj. Butorphanol @ 0.2mg/kg i.m. After 10 minutes, the anaesthesia was induced using Inj. Ketamine @ 5mg/kg i.v. and Inj. Diazepam @ 0.5mg/kg i.v. and the anaesthesia was maintained using 2% Isoflurane with variable vaporizer setting and fresh gas flow of oxygen @ 20 ml/kg/minute. Animal was placed in left lateral recumbency and the right stifle was aseptically prepared using 2.5 per cent povidone iodine, 70 per cent ethyl alcohol and 2 per cent chlorhexidine. A 10 cm long skin incision was made on the cranial aspect of stifle joint starting from the distal femur to proximal tibia to expose the retinaculum. The retinaculum was loosened from its attachment and the trochlea was exposed. Using an osteotome, partial osteotomy was performed on tibial tuberosity for trans positioning of tibial tuberosity to its normal position. A wedge-shaped bone was cut from the trochlear groove and it is placed into the sulcus in an inverted manner after deepening the trochlear groove towards the lateral side (Figure 2). The trans positioned tibial tuberosity was fixed in normal position using a Kirschner wire. Retinaculum was sutured towards medially using PGA (2-0) by Ford interlocking pattern and skin using polyamide (2-0) by cross mattress suture pattern (Figure 3). Post operative radiography showed patella was in position. Post operative antibiotics and analgesics were followed for 2 weeks. The cutaneous sutures were removed on tenth post operative day and the animal made an uneventful recovery.

### Results and Discussion

The cause includes congenital, developmental and traumatic. Most of the prevalence studies identified that females are more predisposed than males. Neuter status of the animal seems to be a risk factor, with neutered dogs having about 3 times odds of developing this condition (L'Eplattenier HF and Montavon P., 2002) [7]. Occasionally, patellar luxation may occur as a complication secondary to treatment of cranial cruciate ligament disease or fractures involving femur or tibia. Because there is evidence that this condition is genetic, dogs diagnosed with patellar luxation should not be bred.

Dogs with Grade I patellar luxation are generally asymptomatic. Occasionally "skipping" type lameness typical in dogs with Grade II patellar luxation. Grade III and Grade IV patellar luxation are characterized by persistent lameness and abnormal posture (Di Dona F *et al.* 2016) [4]. In bilateral lateral dislocation, the stifle appears to be close to each other while the distal extremities are abducted. Large breed dogs

may have "knocked-in-knee" appearance. Diagnosis is based on clinical signs, orthopedic examinations and radiography (lateral and skyline view).

Medical management may be indicated in dogs with Grade I patellar luxation with nonsteroidal anti-inflammatory drugs, weight control and physical rehabilitation exercises. Surgical correction of patellar luxation include soft tissue reconstruction procedures (Overlap of medial retinaculum, patellar and tibial antirotational suture ligaments, desmotomy and partial capsulectomy and quadriceps release) and bone reconstruction procedures (Trochleoplasty-trochlear chondroplasty, trochlear wedge or block recession sulcoplasty), Tibial tuberosity transposition, patellectomy and femoral osteotomy (Harasen G 2006) [5]. Post operative care includes soft padded bandage for 10-14 days, pain medications and physiotherapy. Prognosis is favorable. Recurrence may occur but always of a lesser grade than preoperative grade. The most common complication includes patellar relaxation, loose or broken implants or fracture of proximal tibia (Anna E Dunlap, 2016) [1].



**Fig 1:** Skyline view of both the stifle with laterally luxated patella



**Fig 2:** A wedge shaped bone was cut Patella in right hind limb and replaced in an inverted manner.



**Fig 3:** Patella was replaced into its normal anatomical position.

## Conclusion

The case of congenital bilateral lateral luxation of patella was successfully corrected through trochlear wedge resection sulcoplasty with tibial tuberosity reposition. The animal made uneventful recovery with normal gait.

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## Conflict of Interest

Not available

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