



ISSN: 2456-2912

VET 2024; 9(6): 584-586

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www.veterinarypaper.com

Received: 15-10-2024

Accepted: 24-11-2024

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Medial imbrication technique for congenital bilateral patellar luxation in a calf

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Abstract

A two month old jersey cross bred female calf was presented to the madras veterinary college teaching hospital with anamnesis of crouched hindlimbs with difficulty in walking since birth. Physical parameters were within the normal range. Clinical examination revealed laterally displaced patella in both the stifle joints. Radiography confirmed lateral luxation of patella with normal trochlear ridges. Laterally displaced patella was fixed on medial side by imbrication technique under Xylazine sedation and spinal anaesthesia. Post-surgery the calf received antibiotic and anti-inflammatory medications with Robert Jones bandage reinforced with splint. The calf recovered successfully and regained normal gait.

Keywords: Congenital patellar luxation, bilateral patellar luxation, medial imbrication technique

Introduction

In calves lateral luxation of patella is rare condition in which unilateral and bilateral luxation of patella may occur (Strous *et al.*, 2019) ^[1]. Etiology for lateral luxation is either congenital or acquired. Congenital abnormalities occur due to malformation of Patellar ligament, trochlear ridges hypoplasia and medial rotation of tibia (Piermattei *et al.*, 2006) ^[2]. The presence of shallow trochlear groove and ridges may predispose the patella to luxation (Shettko and Trostle, 2000) ^[3]. Lateral patellar luxation may also occur with hypoplastic vastus medialis muscle which displace the patella from groove due to inability of muscle to bear the weight bearing force (Kim *et al.*, 2005) ^[4]. Pedigree analysis and breeding trails revealed that these anomalies are autosomal recessive gene. When the calf affected with bilateral patellar luxation tend to stand on crouched posture. This is due to change in the contracture force of group of quadriceps muscle. The function of quadriceps muscle is to extend the stifle joint but rather laterally luxated patella force quadriceps muscle to flex the stifle joint (Meagher, 1974) ^[5]. Therefore the calf not able to stand on upright position. Various surgical correction of patella have been reported which involve lateral or medial desmotomy, medial or lateral imbrication, tibial tuberosity transposition, osteotomies and trochleoplasty (Kalayci *et al.*, 2017) ^[6]. This study describes the clinical and radiographic findings and the surgical treatment of congenital bilateral patella luxation in a cross bred jersey calf.

Materials and Methods

A two month old female cross bred jersey calf was presented to Madras veterinary teaching hospital with reluctant to stand on its hindlimbs since birth and showed difficulty in nursing and feeding. General clinical examination revealed no abnormalities on physical parameters except mild swelling in the stifle joint, irregular posture and gait (Fig. 1.). Palpation of right and left stifle joints revealed laterally luxated patella and were reducible into normal anatomical position. The radiographic examination revealed trochlear ridges were normal and patella were laterally luxated on both the hind limbs (Fig. 2). The case was diagnosed as grade 3 patellar luxation. Since trochlear ridges were normal imbrication technique was preferred over other techniques. Animal was fasted for 6 hours before surgery. Surgical site was shaved and aseptically prepared by scrubbing 5% Povidone iodine and 4% chlorhexidine. Animal was sedated with xylazine 0.1 mg/kg and spinal anaesthesia using 2% Lignocaine 1 mg/kg at

lumbosacral space. A 7.5 cm parapatellar curvilinear skin incision was made on the skin, subcutaneous tissue from proximal to the tibial crest. The biceps femoris muscles identified and incised at their insertion adjacent to the lateral, for complete releasing of patella, the lateral patellar and femoropatellar ligaments were transected without invading to joint. Then the patella was easily repositioned over the trochlea groove. In order to stabilize the patella into trochlear groove suturing of parapatellar fascia and sartorius muscle tendon to the medial joint capsule and to the medial patellar ligament using a non absorbable suture nylon no.2 in an interrupted figure of eight pattern (Fig. 3). The limb flexed and extended through a complete range of motion multiple times to confirm the absence of luxation. The subcutaneous layer was approximated using an absorbable suture with a running subcuticular pattern, then skin was closed in an simple interrupted pattern using non absorbable suture silk no.1. The same procedure was followed on the other limb on the same day, a sterile and well padded bandage was applied for supporting the limbs. Postoperative radiograph confirmed the proper resting of patella in the trochlear groove. Antibiotic Ceftriaxone 20 mg/kg b.wt and Gentamicin 4 mg/kg b.wt and anti inflammatory Meloxicam 0.5 mg/kg b.wt followed post operatively.

Results and Discussion

Animal started bear weight on affected limbs with support of PVC splint from next postoperative day and began to walk normally from day 21 (Fig.5). Radiographic examination after 2 week of surgery revealed patella positioned in trochlear ridges (Fig. 4) and soft tissue inflammation was reduced. The calf regained its normal function of the limbs and no complications observed in any of the limbs. The calf was fully recovered after 6 weeks of surgery. Correction of patella involves the stabilization of patella into the trochlear ridge to increase the flexion and extension of the limbs (Vasseur, 2003) [7]. Bilateral patella luxation is often classified as congenital and causative factor for patella luxation remain conjectural (O'meara & Lischer, 2009) [8]. Congenital patellar luxation often associated with hypoplasia of femoral trochlea or intertrochlear groove (Dyson, 1998) [9]. This was contradictory to our study where the patella was luxated laterally and femoral trochlear ridges were normal. This was confirmed in radiograph and classified as grade III patellar luxation. Patella luxation causes contraction of quadriceps muscle and ligament on luxated side and produced tension on opposite side of luxation. Kalayci *et al.*, (2017) [10] reported that lateral release incision over the retinaculum release the tension on patella exerted by the contracted thickened retinaculum, muscles and joint capsule, Thereby allowing the patella to freely glide over the trochlear ridges. In this case, parapatellar release incision with imbrications of medial joint capsule was performed to provide a stable fixation of the patella. This combination of these technique successfully applied on goat and calf. The most common complication of patella luxation are wound dehiscence and relaxation of patella (Okur *et al.*, 2021) [11] Which were not observed in the present case. In conclusion the aim of the study is to state that congenital lateral patella luxation can be successfully treated with imbrication technique by suturing parapatellar fascia and sartorius muscle tendon to the medial patellar ligament. The prognosis is good when corrective surgery is made early in the course of disease, and animal may regain the normal function of the limb.



Fig 1: Bilateral patella luxation with crouched posture



Fig 2: Sky line radiograph showed Normal trochlear ridges with laterally luxated patella(Arrow head)



Fig 3: Intraoperative view of lateral release of patella and imbrications sutures on medial retinaculum

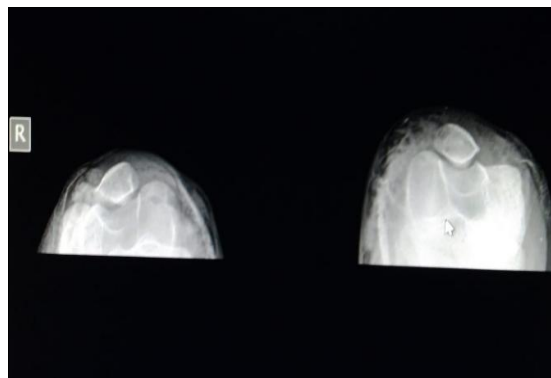


Fig 4: Postoperative radiograph showed patella positioned in trochlear ridges



Fig 5: The calf after 2 months Post operative

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Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article

Mahan PT, Kumar MP, Bharathidasan M, Simon S, Prasad AA. Medial imbrication technique for Congenital Bilateral Patellar Luxation in a calf. *International Journal of Veterinary Sciences and Animal Husbandry.* 2024;9(6):584-586.