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Surgical repair of bilateral traumatic lateral patellar luxation associated with injury of medal stifle joint capsule and fascia in a shetland pony

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An 8-day-old female Shetland pony was referred to the Jeonbuk animal medical center for evaluation of bilateral hindlimb lameness. The foal had been severely lame in the both hind leg since birth. The luxation of the patella was confirmed on physical examinations. During the operation, extensive soft tissue damage and hemorrhage were observed around the medial patellar ligament. Lateral patellar luxation was surgically repaired using lateral release of the patella and medial imbrication of the joint capsule. Follow up revealed that lameness improved during postoperative period. It was concluded that patella luxation as a traumatic cause of lameness in foals can be corrected by surgical techniques successfully.

Key words: Lateral patellar luxation, surgery, shetland pony, foal, stifle.

INTRODUCTION

The lateral patellar luxation is not a common disease in horse and miniature pony (O'meara and Lischer, 2009). Patellar luxation is largely categorized into three underlying causes: congenital, developmental, and traumatic (Busschers, 2009). Patellar luxation due to trauma is reported in foals and horses and can occur both laterally (Ogden et al., 2019) or medially (Hart et al., 2009; O'meara and Lischer, 2009). Most cases reported with congenital problems are found at an early age and trochlear hypoplasia is typical (O'meara and Lischer, 2009). Patellar luxation in adult horses is relatively rare and is often considered trauma (Leitch and Kotlikoff, 1980). Lateral patellar luxation is the most common type of patellar luxation in horses. This is because the medial patellar ligament is relatively smaller in size than the lateral patellar ligament, and that the medial trochlear ridge is more prominent (Arighi and Wilson, 1993). This case report describes combined imaging findings and successful surgical repair of a foal with traumatic lateral patellar luxation associated with

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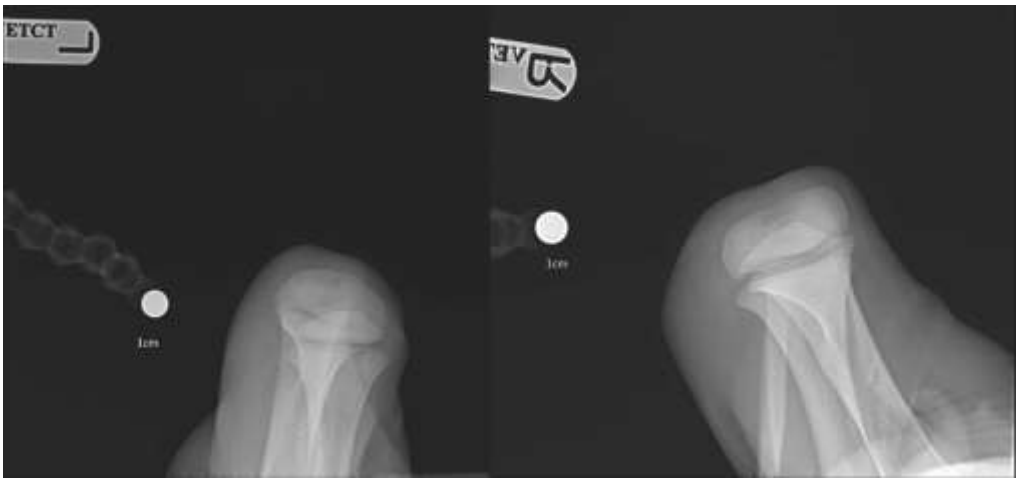

Figure 1. Skyline radiographic views of the both stifle joint. The trochlear grooves of both femurs were normal and patella bone was not observed between the grooves.

extensive soft tissue damage and hemorrhage were observed around the medial patellar ligament.

CASE HISTORY AND CLINICAL EXAMINATION

An eight-day-old Shetland pony with a history of sudden both hind lameness was referred to the Jeonbuk animal medical center. Musculoskeletal examination revealed mild soft tissue swelling of the lateral aspect of the both stifle. The patella of both legs was palpable lateral to the trochlear groove. The foal had several angular limb deformities of both forelimbs. There were no wounds or skin laceration. Hematology and the biochemical profile showed mild dehydration and no other abnormalities were observed. In the skyline radiographic view, the trochlear grooves of both femurs were normal and patella bone was not observed between the grooves. Patella's ossification was not observed because the foal was premature (Figure 1). The soft tissue shadows around the stifle joint are thicker in the lateral region than in the medial side.

Surgical treatment

After preoxygenation for 5 min, anesthesia was induced with propofol (6 mg/kg, intravenous administration; Myungmoon, Korea). After tracheal intubation, anesthesia was maintained by sevoflurane (3-4% concentration) with oxygen. The foal was placed in dorsal recumbency with the both hind limbs suspended in extension. The right stifle was clipped and aseptically prepared for surgical repair. A 10 cm curvilinear skin incision was made from the proximo-medial aspect of the patella to the proximo-medial aspect of the tibia. Extensive soft tissue damage and hemorrhage were observed around the medial patellar ligament (Figure 2). The subcutaneous tissue was dissected using sharp and blunt dissection to expose the fascia and the medial patellar ligament. The medial patellar ligament and overlying tensor fascia and joint capsule were already torn and damaged (Figure 3). After visualization of cartilage, the joint was distended with sterile isotonic fluid. The patella was viewed lying outside the trochlear groove, lateral to the lateral trochlear ridge. The patella was replaced into the femoral trochlear groove with gentle traction. After removal of the soft tissue with edema, medial joint capsule was imbricated with 6 interrupted vertical mattress sutures using monofilament absorbable suture material (2-0 polydioxanone) including the fascia of the quadriceps muscle (Figure 4). The left stifle joint was in the same condition as the right, and the operation was performed in the same way. The foal recovered well from surgery and showed no hindlimb lameness after 5 days of operation (Figure 5).

DISCUSSION

Several literatures have reported different types of patellar luxation in equine species, although it is a rare condition in general population of horses (Kobluk, 1993; La Faunce et al., 1971; O'meara and Lischer, 2009; Talbot and Singer, 2009). Patella luxation in the horse can be congenital, developmental or traumatic in origin and can occur in one or both stifles (Sullins, 2002).

Lateral patella luxation in foals is usually congenital and is thought to be inherited (Willauer and Vasseur, 1987). This patient was an eight-day-old Shetland pony that suffered from traumatic bilateral patella luxation and disruption of the soft tissue and joint structures.

Surgical correction of lateral patella luxation in horses has resulted in poor results and numerous postoperative

Figure 2. After skin incision, extensive soft tissue damage and hemorrhage was observed around the medial patellar ligament. This hemorrhage did not occur during tissue separation and both sides were found to have the same pattern.

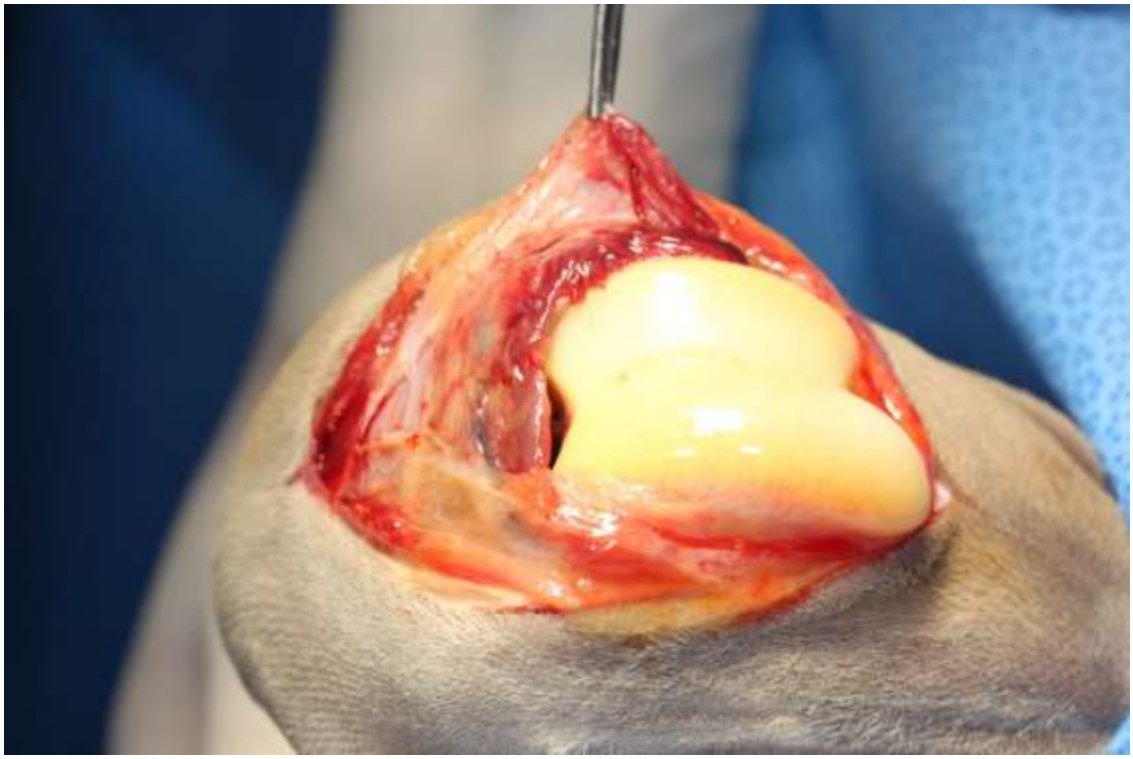

Figure 3. The surrounding tissue of the patella ligament and the capsular capsule were already torn before the incision, and ischemia was observed in the tissue.

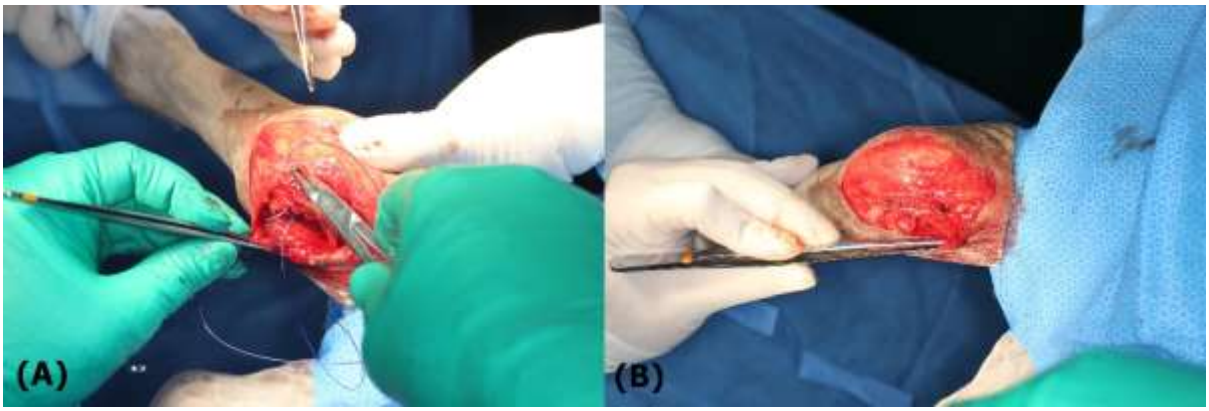

Figure 4. The soft tissue with edema and ischemia was partially removed and the medial joint capsule was imbricated with interrupted vertical mattress sutures.

Figure 5. 5 days after the surgery, the foal recovered well without hindlimb lameness and is standing upright.

complications including degenerative joint disease, septic arthritis, wound dehiscence and re-luxation have been identified (Kobluk, 1993; Leitch and Kotlikoff, 1980).

Two main surgical techniques have been described for correction of patella luxation. These include fascial release with imbrication technique and reconstructive technique (Hart et al., 2009). In the case of traumatic patellar luxation without congenital trochlear dysplasia, trochleoplasty is unnecessary and increases the risk of postoperative complications (Kobluk, 1993). Therefore, in patients with these cases, the correction of patella luxation consists of muscle release and imbrication.

Surgical repair of lateral patella luxation with lateral release technique and medial imbrication of the joint capsules have been described previously (Leitch and Kotlikoff, 1980). In this case, the medial aspect of the

joint capsule was estimated to have been torn by trauma. Therefore, medial imbrication was achieved by placing an interrupted vertical mattress suture and lateral release of the patella was done to reduce the tension and allow the patella to return to the trochlear groove.

It is difficult to predict future horses' ability to exercise after surgical repair of patella luxation. Furthermore, it is difficult to evaluate this specific prognosis because most patients develop patella luxation when they are a foal (Arighi and Wilson, 1993; O'meara and Lischer, 2009). In this patient, normal walking was possible from 3 days after surgery and gradually started to run from 5 days after surgery. It is necessary to evaluate the prognosis through continuous postoperative observation and management.

In addition, this patient was born by preterm birth and ossification of patella was not observed on radiological examination. Therefore, not only the soft tissues around the patella but also the growth of the bones and muscles were presumed not to be properly formed. Although damage to the soft tissues around patella due to trauma is presumed to be the major cause of lateral luxation, it is presumed that it is an additional cause of not supporting extensor apparatus properly because growth is not done properly.

CONCLUSION

This report describes diagnosis and successful surgical correction of traumatic lateral patellar luxation which associated with injury of medial stifle joint capsule and fascia in a foal. With the described surgical method, the patella of the foal was returned to its normal anatomical structure and gait was also improved. Long-term follow up will be required to evaluate the success of the surgical correction in the longer term and the motional usefulness of the foal as an adult.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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