



## The Salter-Harris Type I Femur Fractur Depending on Dystocia in A Newborn Lamb

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### Case Report

#### History

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### ABSTRACT

In this case report, it is aimed to inform about the results of operative treatment of Salter-Harris Type I fracture in the left femur condylar, due to dystocia in a lamb, using intramedullary pin.

In the clinical examination of a 2 days old Akkaraman breed male lamb, which was brought with a complaint of lameness, was found unable to use left leg, only able to walk on 3 legs. When the palpation performed, a closed fracture was discovered in the left femur. Radiologic examination revealed a Salter-Harris Type I fracture in the left femur condyle.

Under general anesthesia, Osteosynthesis was performed with intramedullary Steinmann pin to provide reduction of the fracture. On the postoperative PVC splint guided bandage was applied to the extremity. At postoperative 15 day intervals, clinical and radiological examinations were performed. On the 45th day of the controls, it was observed that the lamb was comfortably use the extremity and there was no problem in its walk.

**Keywords:** Lamb, Salter-Harris Type I, femur fracture

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## Indroduction

Long extremity fractures such as metacarpus, metatarsus, femur, tibia, humerus, radius and ulna frequently occur in pets (Gangl M et al., 2006, Anderson and St-Jean 2008, Arıcan et al., 2014). Causes of fractures; can be considered malpractice interventions and excessive use of force for aid birth on the pelvic canal, constriction of the pelvic canal, postpartum trauma (St-Jean and DeBowes, 1992, Anderson and St-Jean 2008, Nuss et al., 2011, El-Shafaey et al., 2014, Belge et al., 2016).

The treatment of fracture cases depends on the genetic and economic value of the animals, the weight of the animal, the type of the fracture, the place where the fracture is localized and the experience of the veterinarian (Durmuş et al., 2009). Bandage applications constitute a treatment option in newly dislocated fracture cases that fracture fragments have not dislocated. Operative internal fixation methods (intramedullar pin, cerclage, screw, plate,

interlocking pin, etc.) are used in fragmented and complicated fractures where fracture fragments are dislocated (Tulleners, 1986, Ferguson et al., 1990, Kırşan et al., 1999, Arıcan et al., 2014).

In this case report, it was aimed to informing about report the clinical, postoperative radiological findings, and the operative treatment of a 2 days old Akkaraman breed male lamb which has a rare Salter-Harris Type I fracture of the femur condylar, using intramedullary pin.

## Case History

An Akkaraman breed male lamb (Protocol no=253) with a complaint of lameness was brought to Cumhuriyet University Veterinary Faculty Animal Hospital.

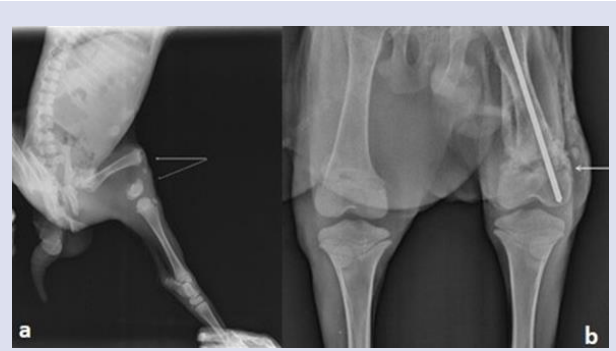
In the anamnesis the owner said that two days ago shepherds helped to a difficult birth of the heifer. Clinical examinations revealed that the animal was unable to use the left leg, only able to

walk on 3 legs and when left femur palpated, it had a closed fracture at its distal. For definite diagnosis, radiography showed a Salter-Harris Type I fracture in the left femur condyle (Figure 1a).

### Treatment

In the general examination, with the results of normal physiological parameters, it was decided to perform an operation on the lamb. Preliminary preparations were completed and placing the broken leg so that it is on top, the lamb was placed on the operation table. Sedation and general anesthesia were performed using Xylazine HCl (0.1 mg/kg, im.) and Ketamine HCl (4 mg/kg, im.) respectively. After disinfection and antisepsis of the fractured area, it was restricted with sterile covers. A skin incision was made from the middle diaphysis of the femur to the proximal of the tibia. After dissection of subcutaneous tissue and muscles, fracture line was reached. Craniolateral surgical approach to fractured site showed caudal displacement of distal fractured end and a large hematoma. The fracture was reduced by levering using an osteotome and fragments were aligned by direct force application using bone-holding forceps. The dislocated fragments were placed in the normal position, Retrograde introduction of the steinman pin was done in between the trochlear ridge with the help of manual bone driller. the reduction was achieved and 4 mm Steinmann pin, which is appropriate to the diameter of the medullary canal, was applied by intramedullary fixation. The pin was completely inserted into the distal fractured (Figure 1b). The joint capsule, fascia lata and subcutaneous tissue were sutured using simple continuous 2-0 chromic catgut and the skin was closed using a 1-0 black braided simple separate suture pattern.

After the operation the operated leg was covered with PVC supported atelier bandage. On postoperative time 1.5 ml/kg im Vetimicin (penicilline G potassium 400000 IU, procaine penicilline G 1200000 IU, 2.684g Streptomycin sulphate, Vetaş, Turkey) and 1,1 mg/kg iv flumeglin (flunixin meglumin, Teknovet, Turkey) was applied for 7 days. On the postoperative 15th day, skin sutures were taken and after that radiological controls repeated at 15 day intervals. (Fig. 1b) During the controls; it was seen that the walking of the patient was better than the previous controls (Fig. 2). On the 45th day of the controls, the Steinmann pin was removed complying with the procedure by general anesthesia. In the 3th month after the operation, it was learned from the patient's owner that it was comfortably use the extremity and there was no problem with its walking.



*Figure 1. Radiographical view of the condylar Salter-Harris Type I fracture (a, arrows) in the left femur and healing at the fracture line (b, arrow) on postoperative 30th day*



*Figure 2. Postoperative 45th day clinical appearance of the case*

### Discussion

Long extremity fractures are frequently encountered in newborn livestock due to dystocia or various traumatic causes (St-Jean and DeBowes, 1992, Görgül et al., 2004, Arıcan et al., 2014, El-Shafaey et al., 2014). The neonatal stage is a critical stage for lambs because of the high morbidity and mortality during this stage (Takcı et al., 2023). Fractures that are formed in the proximal or distal epiphyseal region of long extremity bones are called fizeal fractures or Salter-Harris fractures. In Salter-Harris Type I fractures, the fracture line is located along the growth plate and the epiphysis and metaphyse are separated from each other (Aslanbey, 2002). It is stated that fractures that occur on the long extremity are mostly formed in the diaphyseal region (Fubini and Ducharme, 2004). Ferguson et al. (1990) reported that femur fractures due to dystocia in the calves are formed more in the proximal femur

epiphysis and in the femur diaphysis. Durmuş et al. (9) reported a supracondylar fracture of the right femur formed due to dystocia in a calve, they stated that its was a rare phenomenon. In this presented case, the fracture was identified as Salter Harris Type I in the condyle of the femur and Seeing the Salter-Harris Type I fracture on this lamb is considered to be an uncommon condition.

Treatment of fractures is done in two forms, conservative and operative (Belge et al., 2016). The most commonly used method of conservative treatment is bandage application (Martens et al., 1998, Görgül et al., 2004, Arıcan et al., 2014). In conservative treatment It has been reported that functional recovery is achieved by conservative treatment but various complications develop such as mainly malunion (Görgül et al., 2004). Internal (intramedullary pin, cerclage, screw, plate, interlocking pin) and external fixation methods are used for operative treatment of the fractures (St-Jean and Debowes, 1991, Durmuş et al., 2009, Arıcan et al., 2014, Belge et al, 2016, Salcı et al., 2016). It has been reported that pin applications provide faster and better results in operative treatment than plate and external fixator applications (Torgetto et al., 1994, Durmuş et al., 2009). In this presented case, intramedullary pin application on treatment of Salter-Harris Type I fracture of femur condyle was not give clinically and radiologically complications such as osteomyelitis and pin migrations; on the contrary, with intramedullary pin application was be full recovered. This supports the views of previous researchers (Torgetto et al., 1994, Durmuş et al., 2009). In this presented case; it has been concluded that osteosynthesis performed with intramedullary pin application of Salter-Harris Type I fracture of the femur condylar, which formed during dystocia, is a successful treatment method.

### Conflict of Interest

The authors have no financial or non-financial interests to disclose.

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