

## **RADIOGRAPHIC STUDY OF SESAMOIDITIS IN DONKEYS**

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### **ABSTRACT**

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The present study aimed to describe radiographic changes in the proximal sesamoid bones in case of sesamoiditis in donkeys. The study was carried out on 16 fetlock joints selected from 14 adult donkeys suffering from lameness and painful swelling at the palmar (plantar) aspect of the fetlock joints. Radiographic examination of the fetlock joints were performed using four views to record changes in the proximal sesamoid bones. Results of the present study indicated that, sesamoiditis was diagnosed more commonly in the fore fetlock (68.75%) than the hind fetlock (31.25%). Radiographic findings in sesamoiditis were differentiated into abaxial osteolytic lesions (50.00%), periosteal new bone proliferations (43.75%) and focal area of osteolysis (6.25%). In conclusion, radiographic examination of the fetlock joint proved to be a valuable tool in diagnosis of sesamoiditis in donkeys.

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**Key words:** *Fetlock, Sesamoiditis, Radiography, Donkeys.*

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### **INTRODUCTION**

The fetlock joint represents an important structure to the sound movement of equine limb during both support and swing phases of the stride. Any affection that causes pain or reduction in the range of motion of the joint may seriously affect the limb performance (Pool and Meagher, 1990). A descriptive study of joint disorders mainly affecting equine found that the fetlock joint was the mostly affected one (Behery *et al.*, 1999).

The proximal sesamoid bones are an integral part of the suspensory apparatus that supports the distal limbs and prevents excessive dorsiflexion of the fetlock joint (Nickel *et al.*, 1986). The proximal sesamoid bones become injured during the weight bearing phase of the limb. The weight bearing force transfers a tensile force by the suspensory ligament and distal sesamoidean ligaments or a compressive force by the third metacarpal/metatarsal bone to the proximal sesamoid bones (Thompson and Cheung, 1994).

Radiography remains the most frequently imaging tool used for diagnosis of the bony affections (Misk *et al.*, 2006; Vanderperren and Saunders, 2008; Semieka and Ali, 2012). Radiographic examination of the proximal sesamoid bone in horses is important to understand changes occur in cases of sesamoiditis and their effect on the horse performance (Spike-Pierce and Bramlage, 2003). The aim of the present study

was to describe radiographic changes in the proximal sesamoid bones in case of sesamoiditis in donkeys.

### **MATERIALS and METHODS**

The present study was carried out on 16 fetlock joints. Joints were selected from 14 adult donkeys (3-9 years old) of both sexes admitted to the Veterinary Teaching Hospital – Sohag University. These donkeys were suffering from lameness and painful swelling at the palmar (plantar) aspect of the examined fetlock joints.

Radiographic examination was performed using mobile X-ray machine (Allengers). The radiographic setting factors were 55 - 60 KV. and 10 – 12 mAs, with 90 cm focal spot film distance. Radiographic examination of the fetlock joints were performed using four views; dorsopalmar/plantar, lateromedial, dorsomedial-palmaro/plantarolateral oblique and dorsolateral- palmaro/plantaromedial oblique views. The proximal sesamoid bones were examined for the presence of changes in the bone density and contour and the interpretations were recorded.

### **RESULTS**

#### **Subject details**

A total of 16 affected fetlock joints were radiographically examined in 14 donkeys. Of these donkeys 2 had bilateral forelimb affections and the remaining 12 had only one affected joint. Joints were

11 (68.75%) fore fetlock (7 left and 4 right) and 5 (31.25%) hind fetlock (3 left and 2 right). Mean age of the donkeys was 6.7 years (range 3-9 years old). There were 8 male and 6 female donkeys.

**Radiographic findings**

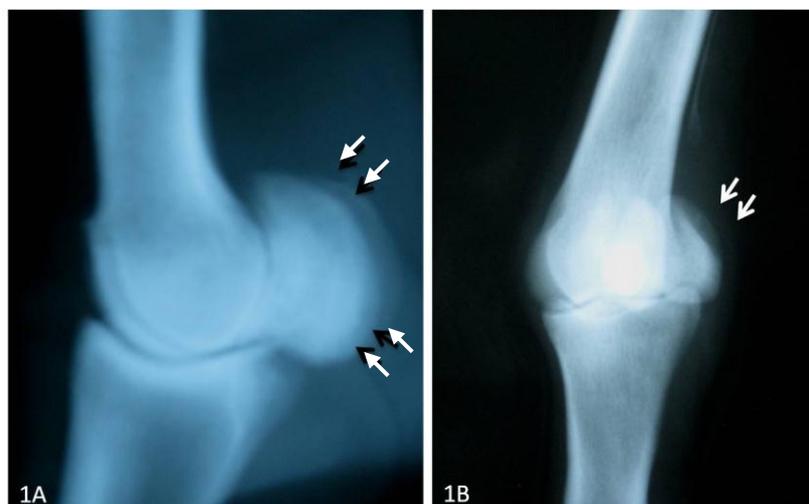
Radiographic changes in cases of sesamoiditis were differentiated in the non articular surface of the bone. Dorsopalmar/plantar view enabled visualization of the proximal sesamoid bones superimposed on the

third metacarpal/metatarsal bone and differentiation of the axial and abaxial borders of the bone. Lateromedial view enabled visualization of the abaxial border of the two proximal sesamoid bones, while the oblique views enabled visualization of the abaxial border of each one individually. Radiographic changes recorded in the proximal sesamoid bones in cases of sesamoiditis, appropriate radiographic views for diagnosis and frequency of occurrence were illustrated in table (1).

**Table 1:** Illustrate radiographic changes in the proximal sesamoid bone, appropriate radiographic views and frequency of occurrence.

Radiographic changes	Appropriate views	Frequency
Abaxial osteolytic lesions	Lateromedial Dorsomedial-palmaro/plantarolateral oblique Dorsolateral-palmaro/plantaromedial oblique	8(50.00%)
Periosteal new bone proliferation	Lateromedial Dorsomedial-palmaro/plantarolateral oblique Dorsolateral-palmaro/plantaromedial oblique Dorsopalmar/plantar (extensive case only)	7(43.75%)
Focal area of osteolysis	Dorsopalmar/plantar	1(6.25%)
Total		16(100%)

*Abaxial osteolytic lesions* were diagnosed in 8 (5 fore fetlock and 3 hind fetlock) joints. Lesions were identified as a number of radiolucent areas along the abaxial border of the proximal sesamoid bones variable in the width and depth (figure 1A&B).



**Fig. 1:** (A) Lateromedial view of the fore fetlock showing abaxial osteolytic lesions in the proximal sesamoid bones (black arrows). (B) dorsolateral-palmaromedial oblique view of the fore fetlock showing abaxial osteolytic lesions in the lateral proximal sesamoid bone (white arrows).

*Periosteal new bone proliferations* were diagnosed in 7 (5 fore fetlock and 2 hind fetlock) joints. The new bone proliferations were identified as radiodense growths vary in shape and size along the abaxial border of the proximal sesamoid bones (figure 2A). In 3 cases (2 fore fetlock and 1 hind fetlock) new bone proliferations were extensive and extend to the apical and basilar portions of the bone (figure 2B&C). Two fore fetlock sesamoiditis were accompanied by calcification of the lateral branch of the suspensory ligament (figure 3).



**Fig. 2A:** Dorsomedial-plantarolateral oblique view of the hind fetlock showing new bone proliferations on the axial border of the medial proximal sesamoid bone (white arrow).



**Fig. 2B-C:** Lateromedial view (B) and dorsopalmar view (C) of the fore fetlock showing new bone proliferations along the axial border of the proximal sesamoid bone and extend to the apical and basilar portions of the bone (White arrow).



**Fig. 3:** Dorsopalmar view of the fore fetlock showing calcification of the lateral branch of the suspensory ligament (black arrows).



**Fig. 4:** Dorsopalmar view of the fore fetlock showing focal osteolysis in the distal half of the lateral sesamoid bone (white arrow).

*Focal area of osteolysis* was diagnosed in one fore fetlock. The lesion was identified as a rounded radiolucent area in the distal half of the lateral sesamoid bone (Figure 4).

## DISCUSSION

The fetlock region in equine is a common site for multiple injuries and lameness. Sesamoiditis was recorded as one of the more frequent disorders in the fetlock joint in donkeys (Mostafa and Abd-Glil, 2008). In the present study definitive diagnosis of sesamoiditis in donkeys was performed by radiographic examination of the fetlock joint using four views. Radiography enabled good visualization of the proximal sesamoid bones margins and assessment of the bone opacity (Vanderperren and Saunders, 2008).

Sesamoiditis was recorded in the present study more commonly in the fore fetlock (68.75%) than hind fetlock (31.25%) (Kane *et al.*, 2003). This attributed to that the distal portion of the equine forelimb is subjected to more kinematic stress than the distal portion of the hindlimb (Back *et al.*, 1995).

Radiographic findings in sesamoiditis were differentiated into abaxial osteolytic lesions, periosteal new bone proliferations and focal area of osteolysis. Studies on the pathogenesis of equine sesamoiditis clarified that the osteolytic lesions

developed along the abaxial border of the proximal sesamoid bones are due to circulatory disturbance (Trumble *et al.*, 1995 and Cornelissen *et al.*, 2002). The new bone proliferations on the abaxial border of the bone and on the apical and basilar portions of the bone developed due to periostitis as a result of strain of the suspensory and distal sesamoidean ligaments (Semieka and Ali, 2012). Two cases were accompanied by calcification of the lateral branch of the suspensory ligament. This suggested the chronicity of the suspensory ligament desmitis. One case was recorded as a rounded focal area of osteolysis in the distal half of the lateral sesamoid bone. This lesion could be a result of osteomyelitis in the bone (Chan and Munroe, 1997).

In conclusion, radiographic examination of the fetlock joint proved to be a valuable tool in diagnosis of sesamoiditis in donkeys. Abaxial osteolysis, periosteal new bone proliferations and focal osteolysis were the radiographic changes recorded in the cases of sesamoiditis in donkeys.

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## دراسة إشعاعية للإلتهاب العظام السمسمانية العليا في الحمير

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هذه الدراسة تهدف لوصف التغيرات الإشعاعية في العظام السمسمانية العليا في حالة التهاب العظام السمسمانية في الحمير. وقد أجريت الدراسة على عدد ١٦ من مفصل الرمانة مختارة من عدد ١٤ حمار بالغ يعانون من العرج وتورم مؤلم في الجانب الخلفي لمفصل الرمانة. تم إجراء الفحص الإشعاعي للمفصل الرمانة باستخدام أربع إتجاهات إشعاعية لتسجيل التغيرات في العظام السمسمانية العليا. وأشارت نتائج الدراسة إلى أن التهاب العظام السمسمانية كان أكثر شيوعاً في المفاصل الأمامية (٦٨.٧٥٪) عن المفاصل الخلفية (٣١.٢٥٪). كانت نتائج التصوير الشعاعي في التهاب العظام السمسمانية العليا إلى ملاحظة التغيرات الأتية: تحلل عظمي خارجي (٥٠.٠٠٪)، نتوءات عظمية خارجية (٤٣.٧٥٪)، ومنطقة تحلل عظمي محورية (٦.٢٥٪). في الختام ثبت أن الفحص الإشعاعي لمفصل الرمانة أداة قيمة في تشخيص التهاب العظام السمسمانية العليا في الحمير.