

# INCIDENCE OF CATASTROPHIC DISTAL LIMB FRACTURES OF RACEHORSES IN KENYA- A RETROSPECTIVE STUDY

Varma V. S., Samiullah M. H., Nguhiu-Mwangi J. A. and Mogoia E. G. M.

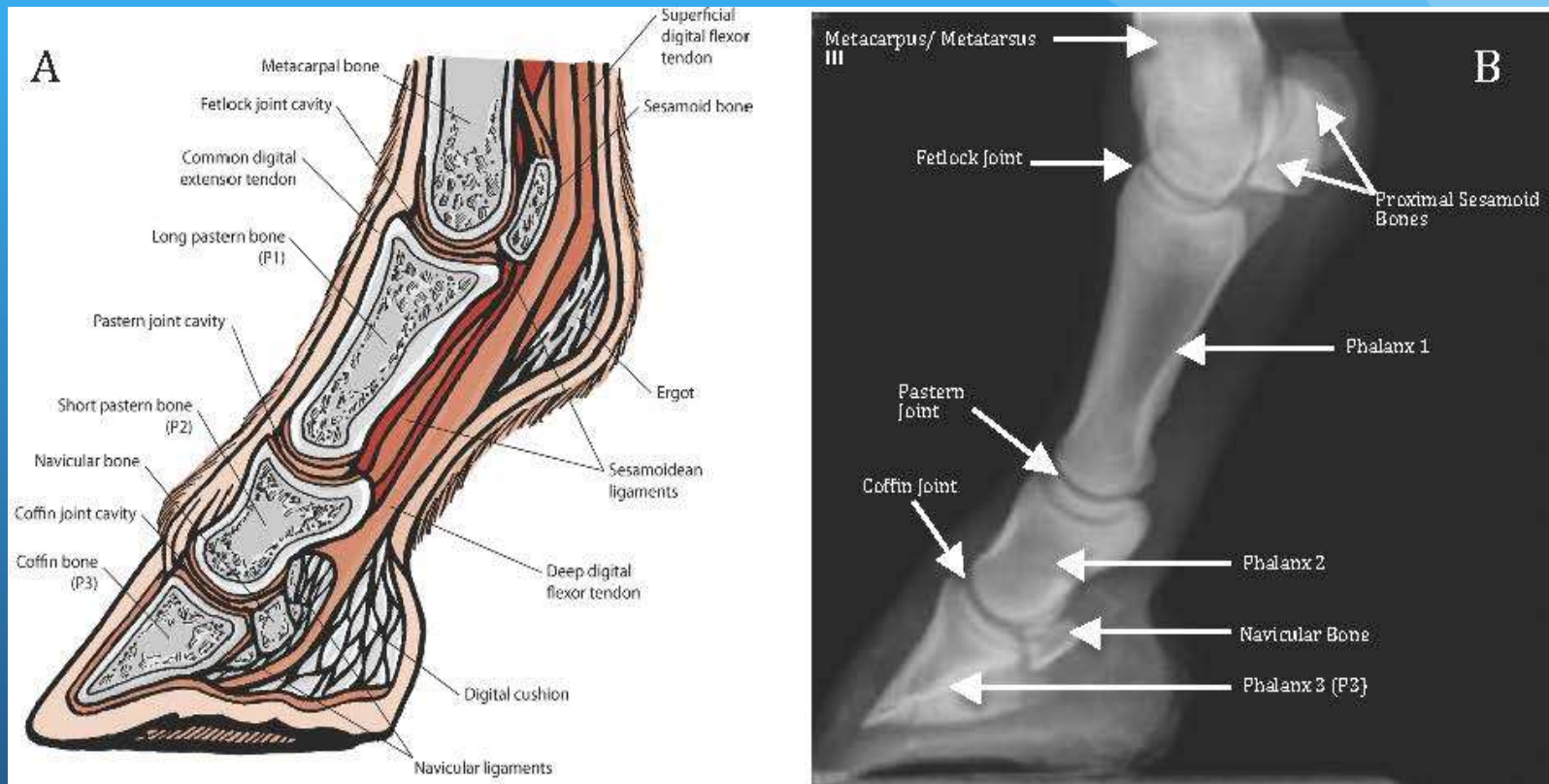
Department of Clinical Studies,  
Faculty of Veterinary Medicine,  
University of Nairobi

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# INTRODUCTION

- Catastrophic distal limb fractures often result in an immediate end of a racehorse's career (Boden *et al.*, 2006) .
- No studies reporting the occurrence of these fractures have been documented in Kenya.
- This is a retrospective study carried out over a 10 year period (2005-2014).
- Total of 543 radiographs were examined out of which 387 (71.3%) showed at least one significant bone lesion.
- Fractures accounted for 23.5% (91/387) of the cases with orthopedic involvement .

# ANATOMY OF THE DISTAL LIMB



**Figure 1:** Schematic diagram and radiograph of a normal equine foot  
A- Schematic diagram of the equine foot viewed from the lateral (Sourced from Disorders of the Foot in Horses, Merck Veterinary Manual Online, 2015); B- Lateral radiograph of a normal horse foot (Sourced from archives at the Jockey club of Kenya).

# COMMON DISTAL LIMB FRACTURES

- Distal limb fractures accounted for 56.0% (51/91) of the total number of fracture cases.

<b>Bones affected</b>	<b>Proportions out of radiographs showing distal limb fractures (n=51)</b>	
	<b>%</b>	<b>Number</b>
Phalangeal fractures	47.1	24
Sesamoid fractures	27.4	14
Metacarpal fractures	19.6	10
Navicular fractures	3.9	2
Metatarsal fractures	2.0	1
Total	100	51

Table 1: Occurrence of distal limb fractures.

# PHALANGEAL FRACTURES

- Phalangeal fractures accounted for 47.1% (24/51) of the distal limb fracture cases.
- P1- 25.0% (6/24).
- P2- 20.8% (5/24).
- P3- 54.2% (13/24).

- P1 fractures can result due to compression or rotational forces such as twisting. Chip fractures occur when there is hyperextension and stress imparted on the fetlock. Avulsion fractures occur when hyperextension exerts excessive pull on the suspensory ligament (Gore *et al.*, 2008; Baxter, 2011; Ross and Dyson, 2011).
- P2 fractures occur from direct trauma or avulsion of soft tissue structures. Sudden stops, starts and short turns may cause comminuted fractures (Stashak, 2002; Baxter, 2011).
- P3 fractures occur due to repeated trauma such as knocking, racing at high speeds and treading on hard surfaces (Stashak, 2002; Gore *et al.*, 2008; Baxter, 2011; Ross and Dyson, 2011).



**Figure 2:** Radiographs of the foot in racehorses suffering from phalangeal fractures

A- An oblique single line fracture of first phalanx (Bold arrow); B- A single line fracture of distal phalanx extensor process (Dotted arrow); C- A saucer fracture of middle phalanx (P2) (Dashed arrow); D- A chip fracture of distal phalanx extensor process (Dash-dot arrow)

# SESAMOID FRACTURES

- Accounted for 27.4% (14/51) of the distal limb fracture cases.

Type of sesamoid fractures	Occurrence of different sesamoid fractures (n=14)	
	%	Number
Apical	71.4	10
Basilar	14.3	2
Mid-body	7.1	1
Full body	7.1	1
Total	100	51

Table 2: The different types of sesamoid fractures.

- Limbs undergo hyperextension during the loading phase, thus putting stress on the suspensory ligament and the distal sesamoidean ligament resulting in fractures (Schnabel *et al.*, 2006).





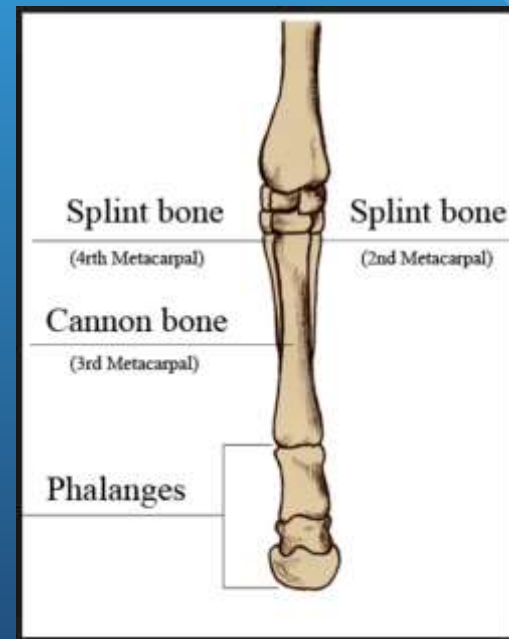
**Figure 3:** Radiographs of the fetlock in racehorses suffering from sesamoid fractures.

A- Lateral view showing a basilar sesamoid fracture (Bold arrow); B- Lateral view showing a mid-body sesamoid fracture (Dotted arrow); C- Lateral view showing a comminuted sesamoid fractures (Dash-dot arrow); D- Lateral view showing an apical sesamoid fracture (Dashed arrow)

# METACARPAL/ METATARSAL FRACTURES

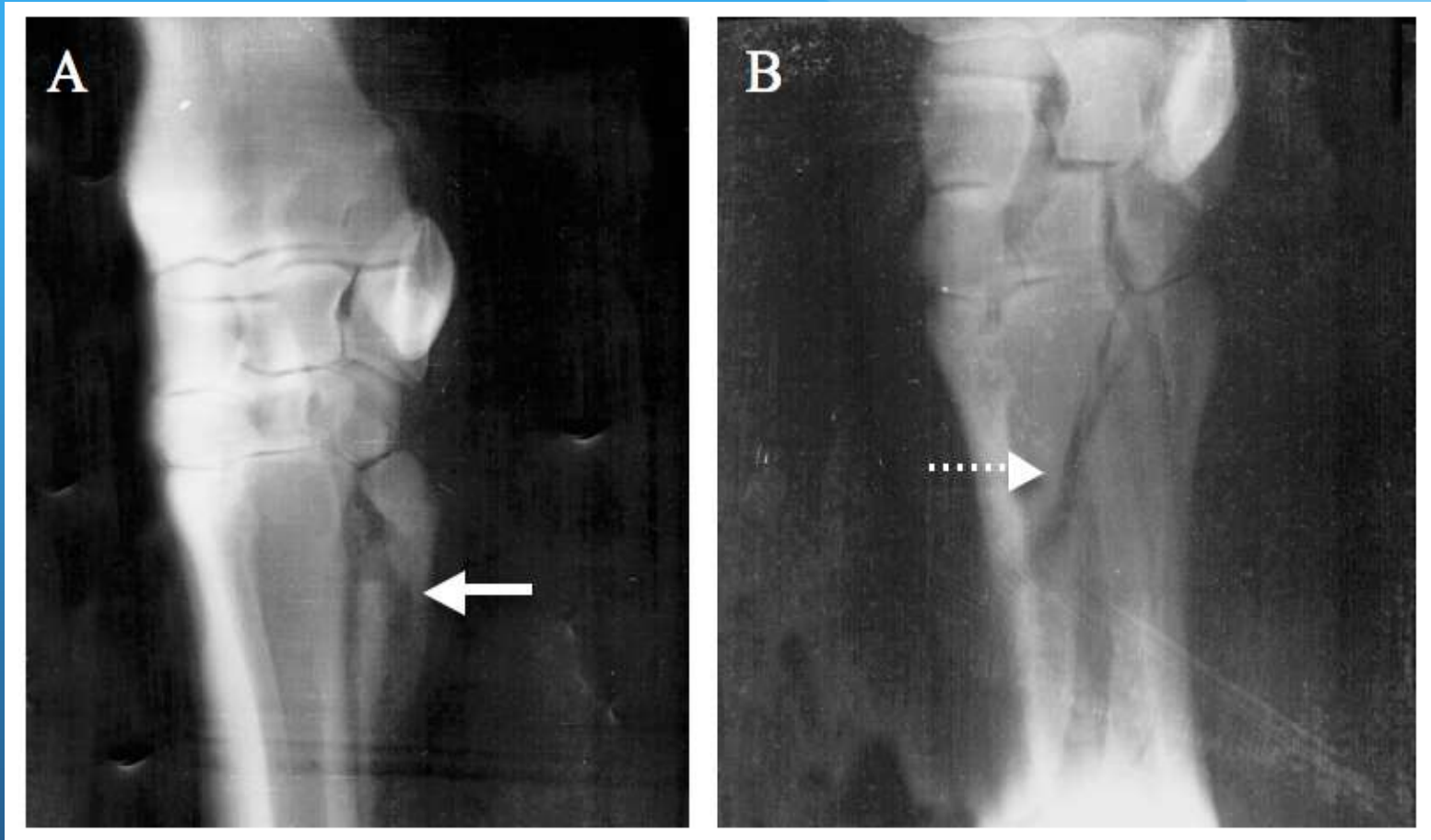
- Metacarpal fractures accounted for 19.6% (10/51) while, metatarsal fractures accounted for only 2.0% (1/51) of the distal limb fracture cases.

- MC II- 10% (1/10).
- MC III- 40% (4/10).
- MC IV- 50% (5/10).



- There was only one metatarsal fracture which involved MT IV.

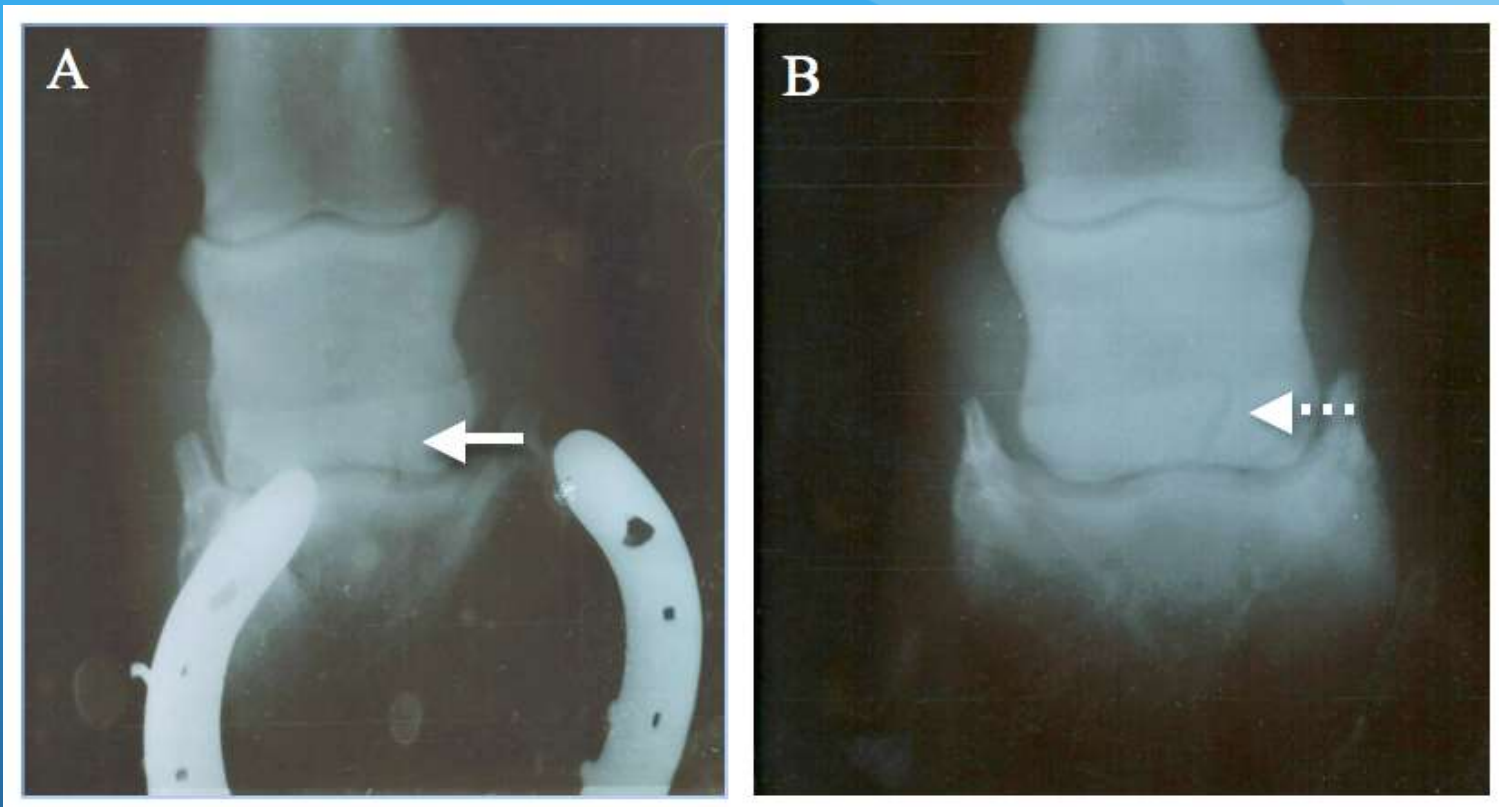
- MC III and MT III fractures most commonly occur due to trauma or high-speed exercise which induces micro-damage within the bones (Riggs, 1999; Zekas *et al.*, 1999a; Stepnik *et al.*, 2004; Morgan *et al.*, 2006; Parkin *et al.*, 2006).
- The remaining MC and MT bone fractures also result due to direct trauma (Stashak, 2002; Gore *et al.*, 2008; Baxter, 2011; Ross and Dyson, 2011).



**Figure 4:** Radiographs of metacarpal fractures in racehorses  
A- Dorsopalmer-Lateromedial view showing a single line fracture of metacarpal IV (Bold arrow); B- Dorsopalmer-Lateromedial view showing a comminuted fracture of metacarpal III (Dotted arrow)

# NAVICULAR BONE FRACTURES

- Navicular bone fractures accounted for only 3.9% (2/51) of the cases with distal limb fractures.
- Concussions to the foot result in simple and comminuted fractures while (Stashak, 2002; Gore *et al.*, 2008).
- Avulsion fractures are associated with navicular disease or trauma (Baxter, 2011; Ross and Dyson, 2011)



Radiographs of the foot in racehorses suffering from navicular bone fractures

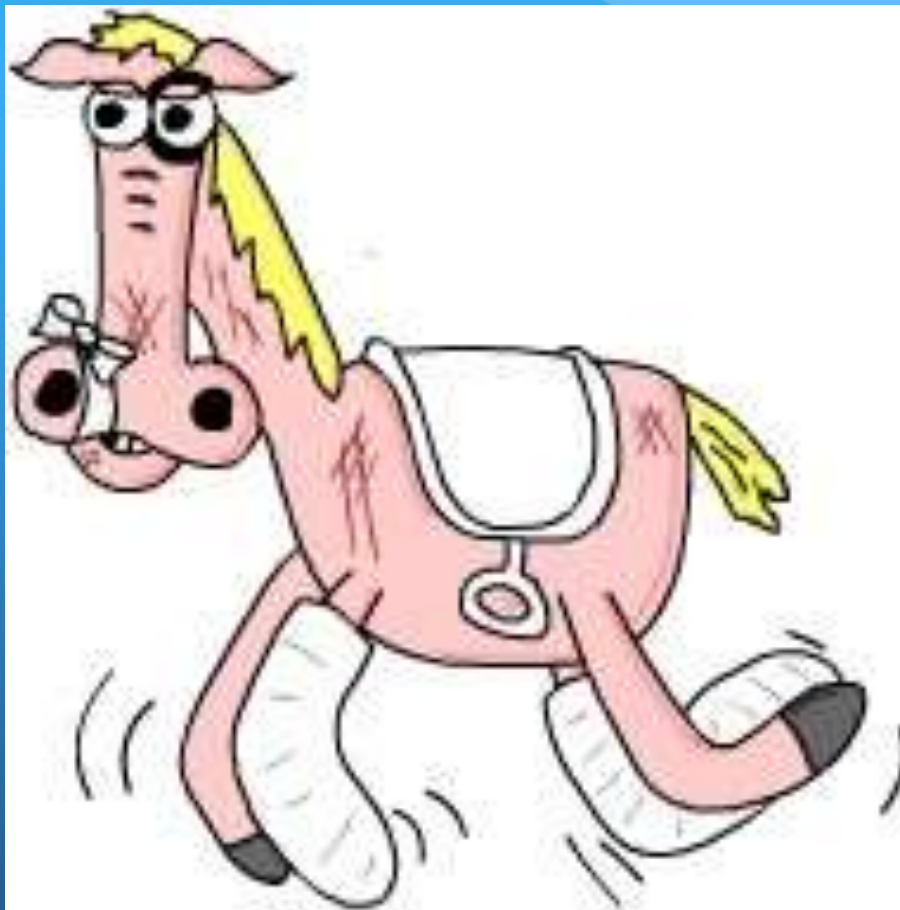
A- Dorsopalmer Proximal-distal oblique view showing a single line fracture of the navicular bone (Bold arrow). A horseshoe is visible as the radiodense arc; B- Dorsopalmer Proximal-distal view showing a single line fracture of the navicular bone (Dotted arrow).

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THANK YOU

