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Cairo University
Faculty of Veterinary Medicine



**Biometric And Radiographic Evaluation Of Long Toe Underrun
Heels In Donkey Hooves**

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(BVSc, Cairo University, 2016)
For the Degree of the Master
(Surgery, Anesthesiology and Radiology)

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Abstract

This study was aimed to determine the correlation coefficients between morphometric and radiometric parameters of the donkey's foot and the presence of lesions in long toe underrun heel. This study was carried on 80 front cadavers hooves of donkey divided into 12 healthy hooves and 68 hooves showed long toe under-run heel conformation. These hooves were collected from veterinary hospital, Faculty of Veterinary Medicine, Cairo University. Front hooves were examined clinically and then digital photography and radiographically were taken. The relationship between the shape of the hoof capsule and the orientation of the distal phalanx in long toe underrun heels in donkeys and the relationship between radiographic measurements of the foot and the presence of radiographic lesions in long toe under-run heel in donkeys were determined. The radiographic lesions associated with long toe under-run heel were pedal osteitis complex (86.6%), navicular bone reaction (26.7%), osteophyte reaction at first phalanx (26.7%) and second phalanx (33.3%), pastern osteoarthritis (13.3%), coffin osteoarthritis (30%), palmar soft tissue calcification (16.6%), and fracture of second phalanx (3.3%). There was a relationship between the shape of the hoof capsule and the orientation of the distal phalanx in long toe underrun heels in donkeys. In conclusion, the present study provides a database for farriers and veterinarians for correct trimming long toe underrun heels in donkeys based on the obtained results

Keywords: long toe, under-run heel, radiology, hoof, parameters.

Dedication

*With honor, I dictate this thesis
to my beloved family: my father,
my mother, my brothers, and my
sister.*

*This thesis is specially dictated
to the soul of my father.*

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In the name of Allah, the most Beneficent, the most Merciful. All the praises and thanks be to Allah, the Lord of the 'Alamin (mankind, jinns and all that exists)

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List of Abbreviations:

3D: 3 dimensions	LWL: Lateral wall length
AA: Apex angle	mAs: milliamperere per second
CA: Coronary angle	Max: Maximum
CBA: Coronary band angle	MCBD: Medial coronet to bottom distance
COP: Center of pressure	MCIII: Third metacarpal bone
COR: Center of rotation	MCP: Metacarpophalangeal
CSLs: Collateral suspensory ligaments	Min: Minimum
DCBH: Dorsal coronary band height	ML: Mediolateral
DDFT: Deep digital flexor tendon	MRI: Magnetic resonance images
DHWA: Dorsal hoof wall angle	MWA: Medial wall angle
DHWL: Dorsal hoof wall length	MWL: Medial wall length
DHWT: Dorsal hoof wall thickness	NPAS: Negative palmar angle syndrome
DIP: Distal interphalangeal	OA: Osteoarthritis
DIPJ: Distal interphalangeal joint	P1: First phalanx
DJD: Degenerative joint disease	P2: Second phalanx
DP: Dorso-palmar	P3: Third phalanx
DSIL: Distal sesamoidean impar ligament	P3A: 3 rd phalanx angle
DWL: Dorsal wall length	P3B: Distal phalanx to bottom distance
FD: Founder distance	P3BA: 3 rd phalanx solar border angle
FFD: Focal spot film distance	P3BL: Lateral distal phalanx to bottom distance
FL: Foot length	P3BM: Medial distal phalanx to bottom distance
GRF: Ground reaction force	P3F: Distal phalanx to frog distance

HA: Heel angle	P3G: Distal phalanx to ground distance
HB%: Hoof balance %	P3HL: Distal phalanx to lateral hoof wall distance
HBS: Hoof base of support	P3HM: Distal phalanx to medial hoof wall distance
HI: Heel height index	P3T: Distal phalanx to toe distance
HL: Heel length	PCBH: Palmar coronary band height
HPA: Hoof pastern axis	PCL: Palmar cortex length
HWA: Hoof wall angle	PIP: Proximal interphalangeal
HWL: Hoof wall length	PIPJ: Proximal interphalangeal joint
KV: Kilovolt	PO: Pedal osteitis
LCBD: Lateral coronet to bottom distance	PPCA: Proximal palmar cortex angle
LM: Lateromedial	PPCL: Proximal palmar cortex length
LP3A: Axis of distal phalanx angle	RA: Reflex angle
LT/LH: Long toe/low heel	SA: Solar angle
LWA: Lateral wall angle	SD: standard deviation
SDFT: Superficial digital flexor tendon	(T: F) ratio: (Toe: foot) ratio
SE: Standard error	TA: Toe angle
ST: Solar thickness	WLD: White line disease
TL: Toe length	HCI: Heel collapse index
K-S: Kolmogorov-Smirnov	

Chapter (1)

Introduction