

RESOLUTION OF EQUINE LAMENESS: MANAGEMENT OF THE EQUINE FOOT, BASED ON ITS ANATOMY AND FUNCTION

P.D.S. RAGHUVANSHI^{1*}, DIVYA MOHAN⁴, G.K. MISHRA², A.K. SINGH⁴, A.P. SINGH⁴, S.K. MAITI³
AND NAVEEN KUMAR⁴

¹Department of Veterinary Surgery, ²Department of Veterinary Gynaecology and Obstetrics, ³Department of Veterinary Medicine, College of Veterinary Science & Animal Husbandry Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora, Durg, Chhattisgarh 491 001 India; ⁴Division of Surgery, ICAR-IVRI, Izatnagar Bareilly, Uttar Pradesh

ABSTRACT

Equine podiatry is the study and management of the equine foot based on its anatomy and function. Proper farriery promotes a healthy functional foot and biomechanical efficiency and prevents lameness. The present study was based on the 12 horses of Counter Terrorism and Jungle Welfare College, Kanker, Chhattisgarh. Most of the minor lameness of either thoracic or pelvic limb associated with the basic farriery faults or mismanagement of the hoof. This paper focuses on fundamental farriery and recognizing subtle changes in hoof conformation that can be used to preserve the integrity of the hoof capsule, along with the structures enclosed within, and thus prevent lameness in the performance horse.

Keywords: Corium, Keratoma, Laminitis, Luxation

Study and management of the equine foot, based on its anatomy and function is known as equine podiatry. Neither anatomy nor function of the heels can be divorced from anatomy and function of the remainder of the foot because of the interdependence between them. A well balanced horse has a better chance of moving efficiently, thereby experiencing less stress. Balance refers to the relationship between the forehead and hind quarters, between the limbs and the body, and between right and left side of the body, so, that mass of the horse is equally distributed (Stashak and Hill, 2002). Although some horses can tolerate these imbalances, while others cannot and may enter a cycle that results in lameness (Stashak *et al.*, 2002). Trimming and shoeing can be categorized as preventive, corrective or therapeutic trimming and shoeing is characterized by balance, support and protection and the goals are long term soundness for performance. Application of the basic and therapeutic farriery to the lame horse provides valid treatment to equine patients (Werner, 2012).

MATERIALS AND METHODS

The present study was on the horses (n=12) presented to the Teaching Veterinary Clinical Complex, College of Veterinary Science Animal Husbandry, Anjora, Durg, Chhattisgarh of either sex (male, n=7; female,

n=5) aged between 6 to 13 years. Majority (n=11) of them belonged to Counter Terrorism and Jungle Welfare College, Kanker, Chhattisgarh and one from local area. The horses were divided into two groups based on their clinical symptoms viz., Group 1 (n=4) lameness along with anorexia and pyrexia and Group 2 (n=8) only showing lameness (Table 1). Further, group 1 horses were showing lameness of different origin like laminitis, keratoma, wound in the foot, and capped hock. However, in group 2, horses were only farriery related deformities either due to delayed and/or faulty trimming and shoeing.

RESULTS AND DISCUSSION

Laminitis: There was typical stance of mare (case 1) with forefeet camped out in the front, animal moved reluctantly and vigorously and also resist, attempts to foot lifted off the ground. After clinical examination, the affected animal was housed in a stall bedded with dry sand. Symptomatically the animal was treated with anti-inflammatory drug (phenyl butazone @15 mg/kg b. wt. I/M plus Flunixin meglumine @ 1.1 mg/kg b. wt. I/V), antimicrobial (oxytetracycline @7 mg/kg b. wt. I/V) and for anti-endotoxin (Butaphosphan and cyanocobalamin @15 ml I/V). For the management of pain, hooves were trimmed by rockering the toes with down heel, to reduce weight bearing forces on the dorsal hoof wall. Thus,

*Corresponding author: dr.pdsr2207@gmail.com

reducing the continued laminar tearing could also reduce the tension on the deep digital flexor tendon (DDFT) and expose the back of the foot to weight bearing, which is generally the least painful region of the foot.

Keratoma: A six year old mare (case 2) was presented for consultation with a history of persistent left hind limb lameness. The lameness had been present for the last 3 months. Clinical examination revealed dark focal painful area in the hoof. Haemorrhage was noted only when the sole was superficially pared at painful area. Tentatively it was diagnosed as foot abscess or subsolar bruising and treated with poultice and anti-inflammatory medications but lameness persisted. The lameness was abolished by lateral posterior digital nerve block. Interestingly, lameness reduced gradually, when mare was unshod because of pregnancy. Lameness occurs when the animal was trotted on a hard surface. The conformation of the foot was changed with respect to size, shape and angle. There was focal discoloured (dark) convex section of sole medial to white line (Fig. 1). Again pain was elicited to hoof testers but the area was also sensitive to pressure. The procedure was done on standing with the mare sedated using xylazine hydrochloride (1 mg/kg, I/V). The foot was desensitized with a biaxial planter nerve block just proximal to sesamoid bones. A tourniquet was applied to the lower limb to control haemorrhages. The hoof was prepared aseptically with potassium permanganate washing and povidone iodine painting. A thin looped hoof knife was used to cut a trough around the perimeter of the lesion. The dissection was continued thorough the sole until a cavity was entered. The overlying flap of the cornfield sole was laid back removed. The cavity was curetted down to normal healthy bone and flap of epidermis was removed. Povidone iodine ointment was placed in the cavity loosely packed with gauze. An impervious bandage was placed on. The mare was shod with reverse shoe with a treatment plate (fix with cortical screw and acrylic paste). The mare was treated with oxytetracycline Hcl @ 10 mg/kg b. wt. for 7 days and Meloxicam @ 0.5 mg/kg b. wt. I/V for 7 days. The bandage was changed on 3rd day interval and wound was packed with povidone iodine ointment. During fourth bandage change cavity (up to the sole) filled with granulation tissue.

Wounds of the Foot: The case 3 was affected with solar wound type I, penetrating deep to the solar corium

up to germinal epithelium (Fig. 2). During examination, assessment of pain was done and wound was curetted with hoof knives (Fig. 3) under palmar digital nerve block with 2 ml of 2% lignocaine hydrochloride and all debris were removed. Foot bandaging was done to cover the foot up to coronary band which provide protection and cushion by treatment plate covering the sole. Post operatively horse received flunixin meglumine @ 1.1 mg/kg b. wt. I/V and oxytetracycline @ 7 mg/kg b. wt. I/V for 7 days.

Capped Hock: An eight years old gelding (case 4) was presented with the history of swelling on right hock with lameness since last five days. The animal was treated by the local veterinarian by anti inflammatory and antibiotics. Physical examination revealed fluctuating swelling with pain sensation and on fine needle aspiration little clear fluid was obtained. The case was diagnosed as capped hock and aseptic aspiration followed by intra-articular corticosteroid injection following application of cold water for few days but it did not yield a considerable response. Thereafter, horse was treated with injection Phenyl butazone @ 15 mg/kg b. wt. I/M and for the prevention of secondary infection antibiotic Oxytetracycline @ 7 mg/kg b. wt. I/V was given for 5 days and advised for complete rest for 30 days. Vigorous daily massage of the area with the palm of the hand after iodex application and '8' figure bandaging applied for pressure. The lameness gradually disappeared initially there was jerky movement which subsidized later on.

Eight horses of 5-12 years of age in group 2 only showed lameness without any other clinical symptoms. Six of them were not showing lameness after removal of shoe, so after the rest of 10 days and proper trimming they resumed on work. Two of them (case No. 11 and 12), showed the softened solar surface and more pain on examination. Both of the horses received application of 1% formalin topically, after removal of shoe, 15 days rest and then they were also returned on work.

Out of 12 horses, 11 recovered uneventfully; only one mare (case No. 1) affected with the laminitis recovered only from clinical symptoms and solar deformities. Further, training and rehabilitation efforts were advised to achieve full performance. A horse without gait abnormalities should move in a balanced manner with all limbs in equilibrium. If lameness is present, it is an examiners task to identify the gait

abnormality, its location and likely causes and recommended appropriate treatment (Kaneps, 2004). These responsibilities are done by either a farrier or an unskilled person. So, veterinarians have to give more emphasis to this proud professional performance.

The numerous causes of laminitis have been defined but leading cause remains gastrointestinal disturbances. Although this condition primarily affects the foot, the disease is actually a systemic disease, which causes disturbances in most of the body systems (Kaneps and Turner, 2004). In the present study, mare suffering from laminitis was treated for gastrointestinal disorder and the root cause was found to be ad lib ration and irregular exercise. Keratoma (case no. 2) has been associated with chronic irritation or trauma to hoof. Keratomas are a rare cause of lameness in horses; however, they are perfect indications for surgery of the equine foot and also come under the consistent historical findings Getman *et al.* (2011). The initial presentation, foot related lameness, associated with focal area of lameness abolished by anaesthesia of palmar digital nerves, is a common equine practice. Usual differential diagnosis for this presentation should include abscess or bruising, punctured wound and focal osteomyelitis. However, in this case neither there was tract or punctured wound in the sole nor was their discolouration on the outer surface. The complete surgical removal of keratoma may be difficult but usually results in resolution of

lameness without regrowth of the mass (Hickman, 1964; Smith *et al.*, 2006). In conclusion, unresolved lameness with pain localized to the focal area or the foot is a diagnostic challenge, with persistent lameness localise to a small section of keratoma with in the dermis of the sole gives favourable results after surgical treatment in comparison to other hoof diseases. In young animals capped hock has been treated successfully and tendon function has returned to normal (Johnson and Lowe, 1974). The degree of luxation and intended use of the animal decides the line of treatment. When the tendon is only mildly subluxated, stall rest for 3 to 6 months often helps the horse to return to work (Bertone, 1998). During treatment of case initially affected horse appear quite lame shortly following injury but with period of time the pain diminished and control of limb restored. The management of full-thickness quarter cracks and toe cracks involves the identification and correction/management of balance issues and coronet displacement issues, unloading the injured region, stabilization of the hoof wall, and committed follow-up (Pleasant, *et al.*, 2012).

Present study emphasized on the timely recognize the problem and application of diagnostic including advance techniques of hoof imaging in the field of equine farriery and proper treatment of related ailments. Further, this exercise is very beneficial for return of performance in equines as well as it prevent recurrence.

Table 1
Animals showing different disease conditions

Groups	Animal No.	Age (years)	Sex	Breed	Diagnosis
Group 1	1	04	Female	Marwari	Laminitis
	2	06	Female	Marwari	Keratoma
	3	12	Male	TBI	Wound of the foot
	4	08	Male	TBI	Capped hock
Group 2	5	11	Male	TBI	Lameness
	6	12	Male	TBI	Lameness
	7	05	Male	Marwari	Lameness
	8	07	Female	TBI	Lameness
	9	11	Female	TBI	Lameness
	10	12	Male	TBI	Lameness
	11	10	Female	TBI	Lameness
	12	12	Male	TBI	Lameness

TBI-Thoroughbred Indian



Fig. 1: Black area at whiteline showing keratoma



Fig. 2: Puncture of hoof



Fig. 3: Curretting of hoof

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