PREFABRICATED POLYVINYLCHLORIDE EXTERNAL COAPTATION FOR THE MANAGEMENT OF METACARPAL FRACTURE IN A BREEDING MURRAH BUFFALO – A CASE REPORT

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ABSTRACT

Adult 6 years old breeding Murrah buffalo bull weighing approximately 500 kg reported with the complaint of lameness in the left hind limb was diagnosed with complete metacarpal fracture based on the history and clinical examination. The fracture limb was stabilized by using a prefabricated polyvinylchloride (PVC) external coaptation. Anti-inflammatory and antibiotics injections along with serratopeptidase boluses were provided for a period of 7 days with restricted movement of the animal. Partial weight bearing of the affected limb was noticed after few weeks of immobilization and after 50 days the weight bearing was almost normal. Following the removal of the external splint, the animal could bear normal weight and no complication was reported thereafter.

Keywords: *Bubalus bubalis*, buffaloes, metatacarpal fracture, Murrah buffalo, prefabricated PVC

INTRODUCTION

Several types of long bone fractures have been discussed in various literatures ranging from simple to compound and communited fractures both in large and small animal practices. Fracture in farm animals are reported to be uncommon which might have occurred following trauma during handling or dystocia (Anderson and Jean, 2008), jumping or accident fall (Velavan *et al*., 2014), or slipping on smooth floor or during transport. Management of fractures in small animals are comparatively easier with good prognosis as compared to buffaloes because of their heavy body weight (Turner, 1984; Ayaz, 2000). The prognosis is therefore guarded and limited in adult animals because of the weight of the animal and degree of the contamination of the wound (Mulon, 2011). Conservative and surgical treatment options can be made available depending upon the bone involved, structures and extent of damage of the bone and surrounding tissues. In this paper, a field based modified method of utilizing a prefabricated polyvinylchloride external coaptation for the successful management of a complete metacarpal bone fracture in a buffalo bull is discussed.

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CASE HISTORY AND OBSERVATION

An adult 6 year old breeding murrah buffalo bull weighing approximately 500 kg, belonging to a Research Complex, ICAR Tripura, was reported with the history of lameness and in the left forelimb since 15 days. Anamnesis revealed that the bull have been in used for natural service prior to development of the existing problem. Prior to presentation, the animal was previously treated with some non-steroidal anti-inflammatory drugs, antibiotics and nervine injections along with bandaging on the affected limb with slight to no improvement evident by inability to bearing weight on the affected limb (Figure 1a and b). Physically, the bull was in good health with normal food and water intake and all the clinical parameters were within the normal physiological limits. On palpation, an intense pain was felt on the left metacarpal region along with signs of crepitation suggestive of complete metacarpal fracture. Radiography could not be undertaken due to non-availability of infrastructure and topography of the site. Based on the history and clinical examination, the case was diagnosed as a closed metacarpal fracture and therefore a suitable method of external coaptation was decided.

RESULTS AND DISCUSSIONS

Preparation of the PVC splint

Prior to the day of surgery, a PVC splint (4" diameter, 10 mm thickness) was prepared after measuring the required length and diameter of the contralateral limb. The PVC pipe was first divided into two halves and the splint was contoured by applying adequate heat and fabricated according to the shape of the fore limb from elbow to hoof. A thick padding of non-absorbable cotton wool was applied on all sides of the splints to prevent from causing any injury to the skin of the animal.

Application of PVC splint

Following 24 h fasting, the animal was sedated with xylazine (0.01 mg/kg, IM) and restrained in right lateral recumbency with the affected limb facing upwards after proper casting with rope and physical methods (Figure 2a). Reduction of the fracture bone was achieved by means of extension and counter-extension of the fractured limb and thick cotton padding was provided from elbow to hoof after applying boric acid powder. The prepared PVC splints were then applied carefully over the cotton padded limb covering all sides from medio-lateral to latero-medial angles. After accurate fixation of the PVC splint, the splints were tightened in place with adhesive tape throughout the length and circumference of the fabricated PVC splint and covered with polythene to protect from water contact (Figure 2b). Following complete immobilization, a course of anti-inflammatory (Inj. Flunixin meglumine 2.2 mg/kg, IM) and antibiotics (Inj. Enrofloxacin 5 mg/kg, IM) injections along with serratopeptidase boluses were provided for a period of 7 days with restricted movement of the animal. Partial weight bearing of the affected limb was noticed after few weeks of immobilization and after 50 days the weight bearing was almost normal (Figure 3a and 3b). Following complete removal of the external splint, the animal could bear normal weight and no complication was reported thereafter (Figure 4a and 4b).

Fracture of metacarpal and metatarsal bones are not uncommon in large animals and other draught purpose animals because of their anatomical and less amount of soft tissue

Figure 1. Showing inability to normal weight bearing on the affected left forelimb, (a and b).

Figure 2. (a): Application of PVC splint in lateral recumbency after sedation and restraint.
(b): Buffalo bull in standing after application of PVC splint and complete recovery.

Figure 3. (a): Removal of PVC splint on 50 days. Almost to normal weight bearing observed on the left forelimb.
(b): Application of hydrotherapy after removal on PVC splint on 50 days.

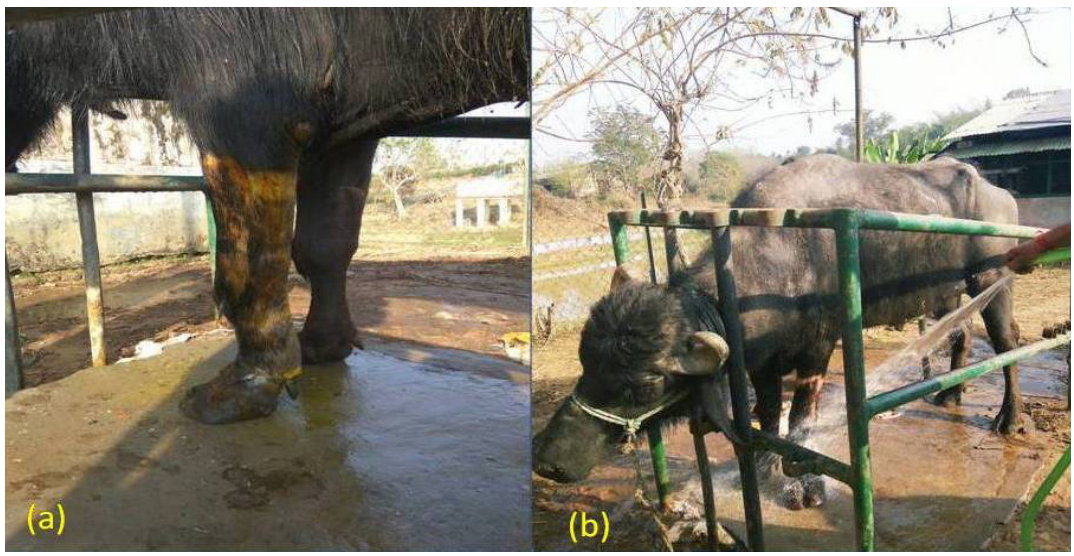

Figure 4. Normal weight bearing of the affected limb after 50 days of removal of PVC external coatation.

covering over these bones. Exciting factors such as trauma, slippery floors, jumping, fighting, kicks, automobile accidents and agricultural tools may contribute to the development of fracture of these bones which can be spiral, oblique, transverse, or comminuted. Early recognition of the extent of associated soft-tissue injury is fundamental to metacarpal fracture management which may otherwise convert into an open or compound fracture resulting from the penetration of the bone within (Ayaz, 2000). Depending upon the type and extent of damage of tissues, either conservative or various surgical methods can be adopted as per the suitability, availability and skill of the surgeon. However, treatment and management of compound fractures will always remain a challenge to all the clinicians (Mulon, 2011). In our present study, closed reduction and immobilization of the fractured limb with prefabricated PVC external coaptation yields satisfactory result while maintaining the fracture bone in proper alignment. The major advantages observed in the present case are low cost, readily available PVC material, ease of application of the PVC material, less anaesthetic stress and immediate weight bearing by the animal. Therefore this treatment protocol can effectively be practiced in large scale for the management of metacarpal fractures in large animals where advanced diagnostic modalities and treatment options are limited.

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