Tibiofibular Fracture and Its Management in an Asian Elephant Calf

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Introduction

Trauma is a potential cause of morbidity and mortality in young elephants. Causes of trauma to elephant calves may include aggression by other elephants and accidents. Limb fractures are unusual in elephants due to the very thick layer of muscles and tissue around bones. The limb joints are in straight lines and the legs work as columns bearing weight when standing. Long bones of elephants are without a marrow cavity and are filled with cancellous bone or 'red marrow' (Chungath 2002).

Generally fractures are immobilized by external or internal fixation. Among external applications, Plaster of Paris (POP) is commonly employed for fractures below knee and hock (O'Connor 2005; Fubini & Ducharme 2004) and it is the most suitable in case of large animals. Here we report a tibiofibular fracture in an elephant calf and its immobilization with a POP cast.

Case history

A wild Asian elephant (*Elephas maximus*) calf was found fallen into a mud pit in an open field in the Khallikote forest range around 90 km away from Bhubaneswar, Odisha. The calf belonged to a crop raiding elephant herd and had fallen into the pit at night. Being unable to rescue the calf, the herd had moved away with the onset of dawn.

Next morning, the calf was seen in the mud pit and rescued by villagers. They washed and cleaned the calf. Then they found that it was unable to stand still and there was lameness in the left hind leg (Fig. 1). The villagers prepared an indigenous medicinal paste and applied it to the affected site with a 'bamboo net' (bamboo strips tied together with rope) covering and handed over the calf to Forest Department personnel. They kept it in the open field under a tent and made him stand with a supporting bamboo pole (Fig. 2).

Diagnosis and treatment

The calf was a male about 2 months of age and weighed about 180 kg. As no field radiograph facility was available, a diagnosis of fracture was made on the following findings. The calf could only stand with support of the left hind limb (Fig. 2) and was unable to move freely and bear weight on the affected limb. There was

Figure 1. Calf showing lameness in left hind limb.

Figure 2. Elephant calf takes support on a bamboo pole.

Figure 3. Removal of faultily applied splint.

Figure 4. Showing the site of the tibiofibular fracture.

Figure 5. Recording the body temperature.

Figure 6. Measuring the heart rate.

swelling of the affected area, excessive mobility at the suspected fracture site with crepitus when the broken ends rubbed against one another and visible shortening of the affected limb. On palpation of the site, a simple complete fracture below the stifle joint (rear knee) at the proximal one third of the tibia-fibula was revealed. It was found that the bamboo net was applied below the fracture site, not providing immobilization of the fracture. So it was decided to remove it (Figs. 3 & 4) and apply external immobilization by POP cast instead.

The body temperature (Fig. 5), heart rate (Fig. 6) and respiration were recorded and appeared normal. The bamboo net along with the indigenous medicine was removed and the site cleaned, gentle hot fomentation was applied (Fig. 7) to reduce inflammation (Oo 2012).

After measuring the fracture site, bandages were prepared by impregnating twelve 6" wide pieces of gauze with 2 kg of POP powder. Topical antibiotic powder (Neosporin) was applied around the affected limb, followed by wrapping of cotton wool in a uniform manner (Fig. 8). Then the prepared POP bandages were soaked in water and applied one by one with uniform and moderate pressure to create a rigid cast covering the site. To make it stronger, the POP cast was reinforced with a bamboo splint (Fig. 9). Both the stifle and hock joints, along with the toes were covered with the POP cast.

The calf was able to bear weight on the fractured limb 30 minutes after application of the POP cast (Fig. 10). Normal saline solution, Ceftriaxone sodium and Meloxicam were given IV and calcium supplement given orally. The forest personnel were advised regarding proper care and management and maintaining a proper nutritional schedule. The calf was kept inside a restricted enclosure to minimise mobility during the healing period. The local veterinary doctor and staff were entrusted with regular check up and medication.

Figure 7. Application of hot fomentation.

Figure 8. Application of topical antibiotic powder.

Figure 9. Application of POP cast reinforced with bamboo splint.

Figure 10. Elephant calf bearing weight on fractured limb after application POP cast.

After application of the POP cast the calf was able to walk. Up to the 9th day post-treatment it was in good condition. On the 10th day the calf became ill, stopped taking food, had coughing and respiratory distress, and became recumbent. Several attempts were taken to revive the calf, but it died. Post-mortem findings revealed that the death was due to pneumonia.

Discussion

In the present case the elephant calf had fallen into a mud pit and the trauma resulted in a long bone fracture. Because of the body size and weight, immobilization of fractures and dislocations is difficult in elephants (Nayar *et al*. 2002). In the present instance as the calf was only about 180 kg body weight a POP cast with a bamboo splint was successfully used for stabilization and immobilization. Sanyathitiseree *et al*. (2001) used a fibreglass cast for the repair of a distal tibiofibular fracture of the right hind leg in an adult female Asian elephant hit by a car. Fibreglass is better than POP due to its lower weight and higher water tolerance capacity, but is not freely available in rural areas.

The final outcome of the treatment using the POP cast could not be assessed due to the premature death of the calf. However, fractures can recover with long periods of nursing and treatment. Nutritious food supplement in injured elephants is very important for their recovery. In the present case the calf was given a liquid diet by feeding bottle. Forceful feeding by untrained personnel and aspiration of fluids may have caused the pneumonia. Slow feeding with intermissions and allowing movement of the tongue by the calf during feeding may help prevent aspiration pneumonia. Feeding of newborn elephant calves should only be done by trained and experienced persons.

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