

Management of a severely lacerated interphalangeal joint in an elephant calf using a custom-fabricated splint

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The present paper describes the management of a severely lacerated interphalangeal joint in an elephant calf using a custom-fabricated splint. A free-ranging elephant calf, approximately six months old and weighing 250 kg, was located in the Keonjhar Division of Odisha, exhibiting non-weight-bearing lameness of the right forelimb with marked flexion at the interphalangeal joint. Preliminary assessment using drone surveillance suggested a severe distal limb injury. For rescue operations, the calf was separated from the herd using auditory deterrents, including firecrackers and hooters. Chemical restraint of the mother was subsequently carried out to facilitate the safe capture and translocation of the calf to Nandankanan Zoological Park. Immobilization was achieved using a remotely delivered collared dart containing xylazine (Xylazin 10% Injection, Dutch Farm International, Netherlands) at a dose of 0.14 mg/kg body weight and ketamine (Ketamin 10% Injection, Dutch Farm International, Netherlands) at a dose of 0.1 mg/kg body weight, administered intramuscularly.

On presentation, clinical examination revealed a severe near full-thickness laceration involving the

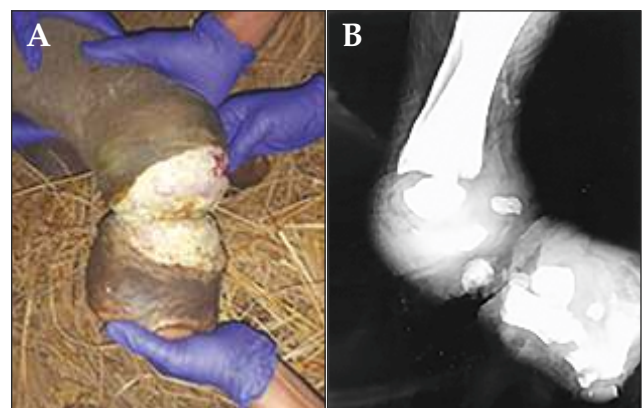


Fig. 1: (A) Severe near full-thickness laceration involving the right interphalangeal joint, with minimal caudal soft tissue continuity preserved; (B) lateral radiographic view of right forelimb revealed a severe near full-thickness laceration involving the right interphalangeal joint.

right interphalangeal joint, with only a small caudal soft-tissue attachment maintaining continuity of the distal limb segment (Fig. 1A). Radiographic evaluation (lateral view) confirmed marked soft-tissue disruption



Fig. 2: (A) a customized "prototype" splint was made up of iron and aluminium padded with cotton and bandage; (B) the final, refined splint was customized using aluminium and padded with protective rubber padding; (C) weight bearing on affected limb; (D) complete healing and weight bearing after 3 months.

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with suspected involvement of the joint capsule (Fig. 1B). The injury resulted in functional instability of the joint and posed a significant risk of chronic lameness or failure of healing in the absence of appropriate intervention.

A customized prototype splint was initially fabricated using iron and aluminium strips with cotton and bandage padding during the first two weeks (Fig. 2A). It was subsequently refined by replacing iron with aluminium to improve stability while reducing weight. The inner surface was lined with rubber to minimize pressure points and prevent the development of pressure sores (Fig. 2B). The splint was designed to maintain the interphalangeal joint in an extended position, providing effective mechanical immobilization while still allowing access for dressing changes (Fig. 2C). Stay sutures using polyamide (No.1 Trulon, Healthium) were placed to approximate wound margins and support tissue regeneration.

Wound care consisted of daily antiseptic dressings using povidone iodine powder, supplemented with topical application of nano-crystalline silver gel (Nanomac, Macleods). Systemic antimicrobial therapy was administered using ceftriaxone–tazobactam (10 mg/kg body weight, i.m.). The splint was maintained for a total duration of three months, with periodic adjustments made according to the progression of wound healing.

The elephant calf showed gradual clinical improvement, with progressive weight-bearing observed within six weeks. By the end of the third month, the wound had healed completely, with full functional

recovery of the limb (Fig. 2d). Overall, the conservative management approach proved effective in facilitating wound healing while avoiding surgical complications.

This case highlights the effectiveness of an indigenous splinting approach in the conservative management of complex distal limb injuries in wild elephants. Timely decision-making, innovative field-adapted orthotic design, and consistent wound care were key factors in the successful rehabilitation of the elephant calf, providing a useful model for future wildlife orthopaedic interventions. The favourable outcome in the present case may be attributed to early immobilization, effective wound management, and sustained external support of the affected joint.

Distal limb injuries in elephants are challenging due to their large body weight and the difficulty in achieving effective immobilization. Conservative management using external support devices has previously been reported to be effective in young Asian elephant calves with limb deformities and other orthopaedic conditions (Boro *et al.*, 2021). In the present case, the custom-fabricated splint provided adequate joint stabilization while allowing regular wound care, ultimately resulting in complete functional recovery without the need for surgical intervention.

Reference

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