Natural metacarpus Fracture Remodeling in a Bottle-reared Mountain Bongo Antelope Calf (Tragelaphus eurycerus isaaci) with Presumed Failure of Passive Transfer

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ABSTRACT

A captive, orphaned mountain bongo antelope calf (Tragelaphus eurycerus isaaci) with a distal metacarpal fracture, and which was presumed to have failure of passive transfer, was successfully hand-reared with only supportive care, using a commercially available colostrum supplement, milk replacer, ceftiofur, an absorbent paste, whole milk, and lactase. Orthopedic treatment was comprised of only modest confinement and cold-laser therapy during the first month of life. Periodic digital radiographs through 6 months of age revealed successful, natural mending of the leg fracture without intervention. This study presents a practical guide for hand-feeding orphaned bongo calves in a field setting, and offers management considerations for neonatal leg fractures that would otherwise warrant euthanasia. The mountain bongo's high conservation value justifies employing novel, non-invasive techniques to save orphaned juveniles that are unlikely to be applied to common taxa under similar conditions.

CASE

On 29 November 2013, an orphaned day-old, 14 kg female bongo calf (Tragelaphus eurycerus isaaci) was found alone > 250 m from its captive, natal group comprising 22 animals. The mother apparently died giving birth. The calf's left front fetlock was noticeably swollen and the calf exhibited a pronounced limp, with the affected hoof rotated ~ 15 degrees inward. The calf was able to place the hoof correctly, but with noticeable discomfort. The calf was immediately confined to a 15 m x 15 m walled pen with cover, water and orchard-grass bedding. A 250-watt infrared heat lamp was positioned 2 m above the bedding for warmth.

Bottle Feeding

With no indication that the calf had nursed from its mother, failure of passive transfer was presumed.[3] Keeper staff immediately delivered 473 ml Mannipro multi-species colostrum supplement (Manna Pro, 707 Spirit 40 Park Dr., Suite 150, St. Louis, MO

Figure 1. *Positioning 8-day-old bongo calf for digital radiograph*.

63005, USA; http://www.mannapro.com/) mixed according to label directions, and fed at 40 C with a standard 1.89 L heifer nursing bottle. Supplement volume was based upon 14 kg body weight. The calf exhibited a good sucking response, and expelled a mucous stool after mild anal stimulation with warm water.

Initially the calf was bottle-fed the Manna-Pro colostrum supplement/formula mix every 4 hours from 0600 - 2200 hr for the first 36 hours only, supplemented by 20 ml of Equine Biosponge paste (Platinum Performance, Inc., Buellton, CA 93427; http://www.platinumperformance.com/) immediately following every other feeding, for a total of not more than 80 ml of paste per day. Urination and defecation were stimulated immediately before and after, and midway between, feedings. The calf consumed 237 - 473 ml of formula per bout while leaning on the keeper for stability. To control scours, which started on the second day, the colostrum-supplement formula was replaced with Land-o-Lakes Pro-nurse Multi-species milk replacer (hereafter LLPN; Land O' Lakes Animal Milk Products, 1080 County Road F West, Shoreview, MN 55126, USA; http:// www.lolmilkreplacer.com/). Replacer was prepared by mixing 237 ml powder with 591 ml water and blending this formula 2:1 by volume with Mannipro Bounce Back electrolyte supplement mixed according to label directions (Manna Pro, 707 Spirit 40 Park Dr., Suite 150, St. Louis, MO 63005, USA; http://www.mannapro.com/) . The calf's hydration remained excellent and body temperatures were normal (37.8-38.8 C).

By the end of the first week (calf weight = 15.5 kg), feedings were reduced to t i d. (0600, 1300, 2100 hr), milk replacer volume was increased to 710 - 946 ml per bout, and LLPN concentration was adjusted to 355 ml replacer powder per 887 ml water. The calf stood steadily during feedings without bracing.

Twenty ml of Biosponge paste was given after feedings as necessary to help firm loose stools. A prophylactic course of antibiotics was initiated (Excede, 200mg/ml ceftiofur; Pharmacia and Upjohn Company, Division of Pfizer, Inc., New York, NY 10017, USA; http:// www.excede.com/), dosed at 6.6 mg/kg body weight, given s c, given once every 3 days for 2 weeks, totaling four injections.

During the second and third weeks (calf weight = 20, 22 kg, respectively), milk replacer was adjusted to produce firm stool consistency, with best results achieved by combining 591 ml whole cow's milk with 591 ml LLPN mixed at 177 ml replacer powder per 591 ml water, with the formula fed at 39.4 C. Two crushed generic lactase caplets (9,000 FCC lactase enzyme units) were dissolved into the milk replacer mixture before each feeding. The calf readily consumed 1.18 L of replacer per feeding, and was stimulated to urinate and defecate immediately before and after feeding bouts

and at 0930 hr and 1700 hr. During exercise periods the calf galloped but favored the injured leg.

By day 44, the calf was eating pasture grass, drinking water from a bucket, nibbling a few herbivore pellets offered ad libitum (Antelope 17 diet, Walpole Feed, P.O. Box 1723, Okeechobee, FL 34973), and sprinting across its expanded 75 m x 12 m paddock with no detectable deficit. Gradual weaning was initiated on day 94 with feedings reduced to b I d (0600, 1900 hr) and volume reduced to 946 ml formula (1:1 whole milk:LLPN) per feeding. The calf was fed 828 ml of formula once per day at 0600 hr from days 106-113 and 473 ml of formula at 0600 hr from days 114-120. Weaning was achieved by day 121, by which time calf was consuming 0.5 kg herbivore pellets per day, grazing pasture grass and native vegetation for several hours per day, and accepting Zupreem Primate Dry biscuits (Premium International Products, Inc., P.O. Box 2094, Mission, KS 66201, USA; http://zupreem.com/) as treats.

Figure 2. *Dorso-palmar views of left metacarpus at: (a) 8 days of age; (b) 42 days, with normal right leg for comparison; and (c) 173 days.*

Orthopedics

Digital radiographs were taken on day 8 using a Sound Eklin Tour 1190 processor mated to a MinXray HF 80 emitter head, with the calf positioned voluntarily (Fig. 1). Distal metacarpal fracture was clearly seen in dorsal-palmar view of left metacarpus (Fig. 2). Because of the fracture's orientation and calf's age and disposition, the health care team opted to allow natural healing without intervention. The calf was allowed to self-limit mobility throughout the healing process, without analgesic treatment.

Upon the advice of equine practitioners, a holistic, 3-week course of cold-laser therapy was initiated after the first week of life. Both heads of a Erchonia PL 5000 laser (635 nm) were focused for six continuous minutes s i d (at 0600 hr) on the circumference of the fracture, <0.03 m from the skin. Laser settings were as follows:

- Preset head, Basic Neurological (Hz): 4, 9, 33, 60
- Programmable head, Bone (Hz): 45, 20.5, 454, 9

Radiographs were repeated on days 42 (calf weight ~32 kg) and 173 (weight = 71 kg), revealing remarkable, natural remodeling and lengthening of the metacarpus (Fig. 2). No orthopedic issues were encountered during the calf's development, with growth comparable to same-aged, parent-reared calves from its natal herd. Normal ambulation was achieved by day 65. By 400 days of age, no health issues had developed.

CONCLUSIONS

This case helps guide hand-rearing procedures for mountain bongo antelope calves and illuminates the enormous capacity for natural leg-fracture mending in rapidly growing ungulate neonates. As the mountain bongo is an antelope of high conservation value,[1,2] the practical approach presented here benefits both herd management and population recovery by exploring non-invasive techniques for successfully rearing calves that otherwise likely would be euthanized.

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