Arthrodesis of a Distal Interphalangeal Joint in a wild African Buffalo (*Syncerus caffer*)

Anthony Scott Shakespeare*

Department of Production Animal Studies, Faculty of Veterinary Sciences, University of Pretoria, Private bag X04, Onderstepoort, 0110 South Africa

Abstract: Intensification of wild ruminants has resulted in more lameness cases that are presented for medical and surgical intervention. Claw problems in these wild and often dangerous animals, although similar to those seen in domestic bovines often require quick decisions and speedy adaptations of generally accepted treatment and procedure protocols. The arthrodesis of the pedal joint in a buffalo cow is one such example.

Keywords: Wild, ruminant, claw, fusion, stability.

INTRODUCTION

As the numbers of many wildlife species plummet, this scarcity factor is making wildlife farming a viable if not highly profitable business. However, this often involves some degree of intensification which often results in problems that are rarely seen in the wild. As the value of farmed wildlife increases so does the demand for better medical and surgical interventions of the individual animals and treatments and procedures used in commercial stock often have to be adapted and modified in these animals. The following is an illustrated guide demonstrating an arthrodesis of the distant interphalangeal joint (D.I.P.) in an African buffalo cow (*Syncerus caffer*).

CASE HISTORY

An African buffalo cow of +/- 800 kilograms body weight had developed a non-weight bearing lameness of her left front leg. She was the dominant cow in a herd of +/-150 buffalo that freely ranged a large game farm specializing in breeding disease free animals in the north east of South Africa. She had borne 7 or 8 very saleable calves and was worth around $100,000 to the owner.

The lameness had been noticed a few weeks prior and had progressed steadily with the buffalo initially lagging behind the herd and subsequently becoming isolated by which time she lay down a lot and grazed within a very restricted area.

On viewing the buffalo cow in a boma, a grade 5 lameness was evident and even whilst standing still she rarely placed much weight on the affected leg (Figure **1**). She would continually lift this foot whenever the claws touched the ground.

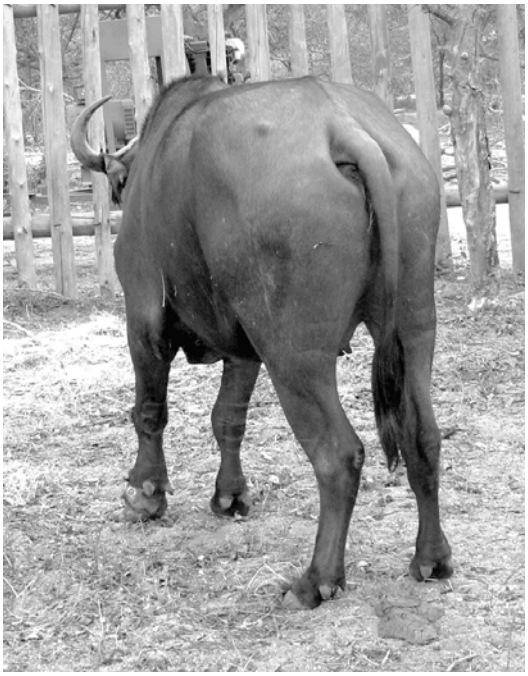

Figure 1: The lame buffalo cow as presented in a boma.

A week prior the attending wildlife veterinarian had flushed the wound and had administered systemic antibiotics and pain medication.

The pastern area was visibly swollen and an open lesion could be seen in the abaxial, mid pastern area of the fore, lateral claw. From a distance the problem looked like an interdigital phlegmon from a penetrating wound.

ANAESTHESIA

The patient was darted down with 4 milligrams of thiofentanil and 20 milligrams of azaperone tartrate and

*Address correspondence to this author at the Department of Production Animal Studies, Faculty of Veterinary Sciences, University of Pretoria, Private bag X04, Onderstepoort, 0110 South Africa; Tel: +270125298287;
Fax: +270125298411; E-mail: tony.shakespeare@up.ac.za

ISSN: 1927-5196 / E-ISSN: 1927-520X/15

once blind folded and restrained she has given 100 milligrams ketamine hydrochloride intra-venously into an ear vein. The cow was placed in sternal recumbency with the affected front digit pulled forward. Throughout the +/-1½ hour procedure the buffalo was continuously monitored and she was topped up twice with an additional 50 milligrams of ketamine hydrochloride on each occasion.

CLINICAL SIGNS

On closer inspection of the lower left, front, lateral digital extremity there was an open, penetrating skin lesion of +/- 1 centimetre diameter in the mid, abaxial pastern area approximately 2 centimetres above the coronary band (Figure **2**). A yellow, pasty exudate could be discharged from the open lesion by applying pressure to the surrounding skin. The whole lateral claw was severely swollen from the coronary band up to the fetlock.

Figure 2: The external penetrating skin lesion on the left, front, lateral digit.

The affected leg was X-rayed using a portable digital X-ray unit and within seconds it was determined that there was a septic arthritis of the D.I.P. joint (Figures **3** & **4**).

The diagnosis and the various treatment options along with their advantages and disadvantages were, due to severe time constraints, quickly discussed with the owner who then opted for an arthrodesis of the affected joint.

Figure 3: X-raying the affected digit using a portable, digital X-ray unit.

Figure 4: The X-ray image clearly shows an infected pedal joint.

SURGICAL PROCEDURE

A tourniquet was applied to the metacarpal area and a regional anaesthetic block was done using 20 millilitres of a 2% lignocaine hydrochloide given intravenously into the distended common dorsal digital vein (Figure **5**). An additional 20 millilitres of the 2% lignocaine hydrochloide was given deep subcutaneously through the posterior skin fold of the lateral claw midway between the heel bulb and the fetlock (Figure **6**). From experience the above gives almost complete pain relief from the intended surgical intervention.

Figure 5: Performing the local regional anaesthetic block.

Figure 6: Injecting local anaesthetic under the skin fold of the posterior pastern.

Whist the local anaesthetic was taking effect a cursory routine claw trim of the affected leg was done and the sole of the lateral claw was lowered as much as possible using an angle grinder with a course sand-paper disc.

The lower, left, front foot from the fetlock distally was scrubbed and sterilized.

Good drainage of the affected joint is required which requires two or more drainage and flushing portals so when possible the utilization of the existing penetrating wound as one of these portals helps limit excessive damage in the coronary band area. In this case the lesion was in the mid, abaxial pastern region and nearly 2 centimetres above the pedal joint which was not suitable for adequate drainage. A dorsal portal site was palpated just above the coronary band of the dorsal claw wall and a commercial, electrical drill with a 6 mm bit was used to drill into the dorsal D.I.P. joint and extended along the joint surface to exit out of the heel bulb (Figure **7**). This was repeated a number of times in the same direction as before but moving 3 to 4 mms both axially and abaxially so that horizontal portals were obtained both anteriorly and posteriorly to the lateral claw. This procedure is to remove all of the affected joint cartilage and adjoining bone of both the distal phalanx 2 and the proximal phalanx 3. A curette was introduced to scrape out affected and loose material and to loosen any affected material to either side of the drilled pathways (Figure **8**). The obliterated joint area was flushed out with 3 litres of sterile water

Figure 7: Drilling out the pedal joint cartilage and surrounding bone.

under pressure which also communicated with the original penetrating wound entrance (Figure **9**).

Figure 8: Curetting out all the debris within the pedal joint.

Figure 9: Flushing out the pedal joint with sterile water.

At this stage of the procedure in bovines a fenestrated tube is passed through and sutured into the joint space and fixed *via* a bandage to the metacarpus so that the joint can be flushed daily without prodding or disturbing the wound. If necessary a block is placed on the medial claw to prevent weight bearing of the affected lateral claw and this claw may be wired to the opposite wooden block to try and limit movement of the affected joint. This joint then usually arthrodeses with fusion of P2 and P3. The wound is flushed daily using the tubing described above until the fluid end exudate is deemed clean enough to remove the drains.

In this buffalo, the lateral claw could not be lowered enough to prevent weight bearing so a wooden block was placed on the sound medial claw (Figure **10**). A very light dressing was applied to the affected area including the claw to just below the fetlock to help prevent external contamination of the wounds since the holding bomas were dirty and dusty. The dressing would also help stabilize the recovering joint. Heavier dressings may more readily disentangle due to the irritation factor and could easily cause collateral and additional damage which cannot be attended to quickly as veterinary assistance is usually hours away.

Figure 10: Applying a wooden block to the sound claw.

Whilst the above was done, 1,2 grams of a combination amoxyicillin sodium and potassium clavulanate dissolved in 10 millilitres of sterile water were injected into the same vein used for the regional anaesthetic and the tourniquet was only removed just prior to reversing the anaesthesia. Systemically the buffalo was injected with florfenicol intramuscularly and meloxicam subcutaneously in the rump region.

60 milligrams of naltrexone hydrochloride was administered intra-venously into an ear vein as an antidote to reverse the anaesthesia.

The buffalo cow was retained in a boma and was fed ad lib alfalfa along with 5 grams of phenylbutazone powder sprinkled over a handful of commercial cattle cubes daily for 10 days.

In wild and especially dangerous animals daily immobilization is not practical and wound assessment and management is all but impossible. However, the local wildlife veterinarian returned on day 3, 5 and 10 post-surgery to knock the animal down and flush the wounds. Although some necrotic debris was evident on the last day of flushing the cow was returned to the herd and 2 months later it was reported that the buffalo cow showed no adverse effects nor signs of lameness. From personal communications with a claw expert in the U.S.A. *(S.R. van Amstel, University of Tennessee, pers.comm. 2013)* [1] bovines with similar procedures are often only flushed 3 or 4 times post-surgery and despite necrotic exudate still exuding from the portals most animals recover uneventfully.

CONCLUSION

Although the treatment of wildlife problems is similar to that in domestic species differences do occur that require adaptation and modification. In wildlife time is a crucial factor as these animals need to be found, anaesthetized, examined, diagnosed, decisions made and then treated usually on the first contact session and within a very short time span. The above case from the time of darting to diagnosing, treating and then to standing recovery was a little over 1½ hours. Previous experience indicates that this time period is close to the upper limit that a wild animal in similar conditions can be safely anaesthetized. Sterile theatres and all their theatrics are usually a daydream and follow up treatment nearly but impossible for all the obvious reasons.

The decision to arthrodese the affected joint and not to immediately amputate the lower digit was due to a number of factors. Firstly, if arthrodesis is successful the animal will have better stability and support of the affected limb especially in rough and rocky terrain. Secondly, the aesthetic value is important especially for potential marketing and sales. Thirdly, this procedure requires less post-operative care and management and lastly, if the joint does not fuse adequately then amputation can be done.

The above is a typical wildlife case that illustrates that, although not ideal, certain treatments and procedures can be done outside the hospital environment and can be successful and make farming wildlife more profitable that hopefully will slow the decline of some of our wildlife populations.

REFERENCES

[1] S.R. van Amstel, Department of Large Animal Clinical Studies, College of Veterinary Medicine, Pers. Comm. The University of Tennessee, Knoxville, TN 37996, USA 2013.

Received on 10-06-2014 Accepted on 16-07-2014 Published on 03-04-2015

DOI: http://dx.doi.org/10.6000/1927-520X.2015.04.01.5