

Case Report

Limb salvage and reconstruction following a zebra attack☆

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ARTICLE INFO

Article history:

Received 19 August 2016

Accepted 2 January 2017

Available online 14 March 2017

Keywords:

Zebra

Bite

Rhodococcus

Salvage

Reconstruction

ABSTRACT

Animal bites are fairly rare events but can cause devastating traumatic injuries to the victim. In addition to the soft tissue, vascular, and orthopedic trauma inflicted by these occurrences, bite injuries also have the potential to introduce an inoculum of microbes, which may progress to an infection if not treated properly and expeditiously.

We present the case of a healthy male who sustained multiple bite wounds from a domestic zebra to his left upper extremity. This attack caused severe damage, including devascularization of the arm at the brachial artery, disruption of the distal biceps and brachialis, stripping of the forearm nerves, and shearing of the overlying soft tissue. The patient was taken emergently to the operating room for revascularization of the extremity utilizing a vein bypass graft. The soft tissue injuries were addressed with numerous irrigation and debridement procedures, during which coverage of the vein bypass graft was obtained using a variety of techniques, including skin flaps, musculocutaneous advancements, and the application of an acellular dermal matrix (AlloDerm) and a collagen-glycosaminoglycan matrix (Integra).

Wound cultures obtained intra-operatively during the irrigation and debridement procedures were notable for the growth of multiple microbes, including *Rhodococcus* spp., which have been documented to cause infection in immunocompromised patients. The patient in this case was treated with a prolonged course of antibiotics, and wound cultures negative for microbial growth were eventually obtained prior to final closure of his wound. The patient then underwent successful biceps reconstruction with a pedicled latissimus dorsi muscle transfer. This case documents the extraordinary multidisciplinary approach provided in the salvage, management, and eventual reconstruction of a mangled left upper extremity that had sustained devastating traumatic injuries resulting from a rather unusual source.

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Introduction

Traumatic injuries caused by equine attacks are rare events with only 3–4.5% of such injuries resulting from bites [1]. In addition to the injuries that may result from these occurrences, bite wounds also carry the risk of transmitting infection. Pathogens reported to have been acquired via equine bites include *Actinobacillus* spp., *Pasteurella* spp., *Staphylococcus* spp., *Streptococcus* spp. including Group B *Strep*, *Bacteroides fragilis*, *Campylobacter ureolyticus*, *Escherichia coli*, *Neisseria* spp., *Prevotella melaninogenica*, *Pseudomonas aeruginosa*, and *Yersinia* spp. [1–3]. Infection with *Rhodococcus* after a bite injury has been described, although it

☆ The following case report has not been presented at any meetings or submitted to any other publishing body for consideration of publication.

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most commonly occurs in immunocompromised patients [1,4–6]. Just over 100 cases of *Rhodococcus equi* infection in humans have been documented in the literature [7]. We present the case of an otherwise healthy male who was attacked by a domestic zebra leading to injuries that necessitated limb salvage surgery as well as treatment of multiple infectious pathogens.

Case report

A 58-year-old right-handed male with no significant co-morbidities was working at a ranch when a domestic zebra bit his left upper extremity multiple times. Upon arrival to the hospital, he was hemodynamically stable and found to have a grossly contaminated 8×15 cm wound extending from the level of the mid-humerus through the antecubital fossa with muscle and tendon exposed (Fig. 1A). He demonstrated decreased active flexion of the elbow, thumb, and index finger and had no sensation in the median nerve distribution. No radial, ulnar, or palmar arch Doppler signals were detected. Computed tomography angiography (CTA) demonstrated an occlusion of the distal left brachial artery (Fig. 2).

He was taken emergently to the operating room for an attempt at limb salvage. After proximal and distal control were obtained, thrombus was removed from the proximal brachial artery as well as from the radial and ulnar arteries. The ipsilateral greater saphenous vein was harvested and placed in non-reversed fashion with end-to-end anastomoses proximally and distally (Fig. 1B). Revascularization of the extremity was achieved approximately 8 h after the initial injury. The distal biceps and brachialis were avascular and thus debrided. The median, radial, and ulnar nerves had been stripped, and the distal brachial artery and proximal ulnar and radial arteries had been degloved across the elbow. Skin flaps were advanced medially from the radial aspect of the forearm to cover the vein graft. Flexor compartment fasciotomy of the distal extremity was performed. A plaster cast was applied to maintain the elbow at 30 degrees of the flexion with the wrist extended slightly. At the end of the procedure, the patient had a palpable left radial pulse.

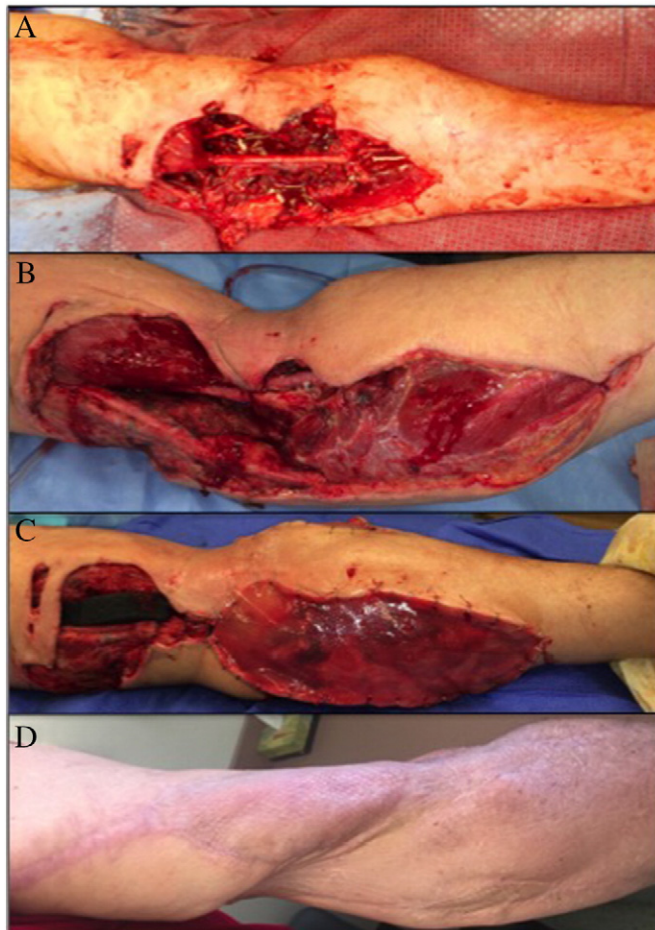


Fig. 1. A - Intra-operative photo of the patient's left upper extremity depicts revascularization of the distal extremity (right) using an ipsilateral greater saphenous vein interposition graft. B - Pre-operative photo taken nine days after the zebra attack demonstrates that the interposition bypass graft (upper central portion of wound) remained exposed due to profound swelling of the extremity. C - Integra was utilized to provide coverage of the distal interposition bypass graft (center of photo) and remaining distal soft tissue defect (right) of the left upper extremity wound nine days after injury. D - Transfer of a pedicled left latissimus dorsi muscle was utilized to reconstruct the patient's distal biceps, which restored 5/5 flexion strength at the left elbow.

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