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Pit Bull attack causing limb threatening vascular trauma —A case series

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ABSTRACT

INTRODUCTION: Non-fatal human dog bites are commonplace amongst animal attacks on human beings and these present with mainly skin and soft tissue injuries. However, they can also present with life threatening head and neck injuries, massive soft tissue trauma, as well as combined orthopedic and vascular extremity injuries where a high possibility of limb loss exists.

PRESENTATION OF CASES: We present two adult dog bite victims with multiple bites inflicted by large canines identified as Pit-Bull Terriers. They were presented with deep lacerations to the axillary area resulting in limb ischemia and loss of upper limb pulses. The right axillary artery was crushed in both patients whilst the axillary vein was lacerated in one. The vessels were repaired; the wounds debrided and both limbs were salvaged.

DISCUSSION: Canine attacks by Pit Bull Terriers and Rottweiler's can occur at any age and in any anatomical area of the body particularly the limbs. Injuries involving the extremities presenting with no pulses or pulsatile bleeding demand an urgent exploration as any undue delay is intolerable especially if there are bony injuries like fractures or fracture/dislocation. All patients with complex neurovascular injuries should be managed by a multidisciplinary team for an optimal outcome.

CONCLUSION: Attacks by Pit Bull Terriers are more likely to cause severe morbidity than other breeds of dogs. Immediate surgical exploration is required to prevent catastrophic outcomes, especially limb loss. Stronger animal control laws, public education and responsible dog ownership may reduce deaths from these canines.

1. Introduction

This paper documents 2 case reports on limb threatening vascular trauma following pit bull attack and its results. It is compliant with the process criteria [1]. In the United States, approximately 324 000 people have non-fatal dog bites each year [2]. Animal-patient injuries present as a spectrum of injuries from superficial skin and soft-tissue injury to severe mauling with the most common "biting animals" being the domesticated dog and house cat (78%) [3] and, as expected, the larger the breed the more severe the injury. Children aged 12 years and under were seven times more likely to have a hospital admission3 following an attack and males accounted for a higher rate of bites than females (52.9%) [2,4]. Injury rates usually tended to decrease with increasing age [2].

Approximately 2% of these injuries go on to require hospitalization for severe soft tissue trauma, neurological, bony and vascular injuries. In the case of limb trauma, the upper limb is more commonly injured than the lower limb but only a small portion of these injuries end up with limb threatening injuries requiring surgical intervention [5].

There are no known published local data available with which to compare, but the critical injuries are mainly seen in urban areas and most of these injuries are referred to an institution which oversees general surgical as well as orthopaedic, paediatric and vascular trauma. All adult injuries have a joint team approach with a surgeon with general and vascular experience and an orthopaedic surgeon involved in consultation and decision making.

2. Case 1

A 34- year old pregnant mother of two was attacked on a public roadway after dropping her children off to school. She was attacked by two (2) large canines identified as two Pit Bull Terriers. And she sustained severe bites to left arm (minimal) and severe bites to her right axilla and upper arm (Fig. 1). She was rescued by passers-by and taken by ambulance to her local hospital which recognized

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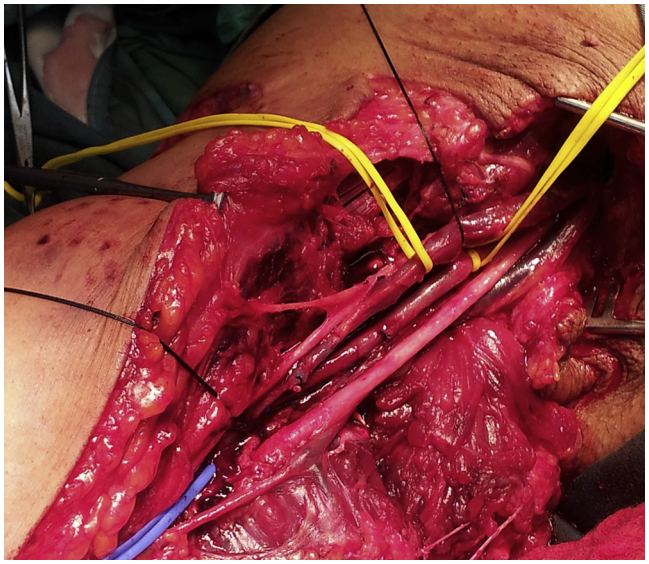

Fig. 1. Showing multiple bite marks with associated crush injury to the arm.

that the bites were severe enough to warrant transfer to a hospital equipped with handling this level of trauma.

She had severe blood loss and was recorded to be in shock initially treated by applying a compressive dressing to tamponade the active bleed which appeared to be venous in origin. The patent was resuscitated and treated for hypovolemic shock and transferred to our facility.

She was stabilized in the A&E department, and an assessment was made to determine the extent of trauma due to the bite injury and to determine the source of her blood loss. Her right hand remained minimally perfused with poor capillary filling, no palpable pulse at the radial, ulna and brachial arteries and it was cooler than the left upper limb. Hand –held Doppler investigation yielded no Doppler signals at the wrist vessels or the brachial artery.

The bleeding from the axilla was greatly reduced by the dressing and a decision was taken to explore it on the presumption that there was vascular injury to the upper brachial or axillary artery (and vein) without the prior need for imaging. If required, an on-table angiogram would be performed during surgery.

At surgery, the axilla was explored and the axillary vein was found to be completely severed (the source of the hemorrhage) and there was a 5 cm length of contused axillary artery which was crushed and thrombosed (Fig. 1). Repair took the form of resection of this section of axillary artery and use of greater saphenous vein from the left thigh and repair of the right axillary artery and vein using this venous conduit (Figs. Fig. 2a,b, , Fig. 3, Fig. 4). The limb warmed up and there was a good radial pulse post repair with confirmatory good Doppler signals.

3. Case 2

A 53-year-old male was attacked by a large canine on the roadway as he was entering his front gate and was found at home by his relatives with multiple lacerations and abrasions to right and left upper limbs. At the District Hospital, the superficial sub centimeter puncture wounds were cleaned and primarily repaired, he was initially noted to have bled significantly prior to admission but was not actively bleeding whilst be attended to at the District Hospital. The patient was noted to have a particularly deep laceration over right axilla and was documented to have some loss of sensation over dorsum of hand and a wrist drop but no documentation of pulses was made. He was referred to the area Trauma Centre for further care where he was found to have loss of sensation and

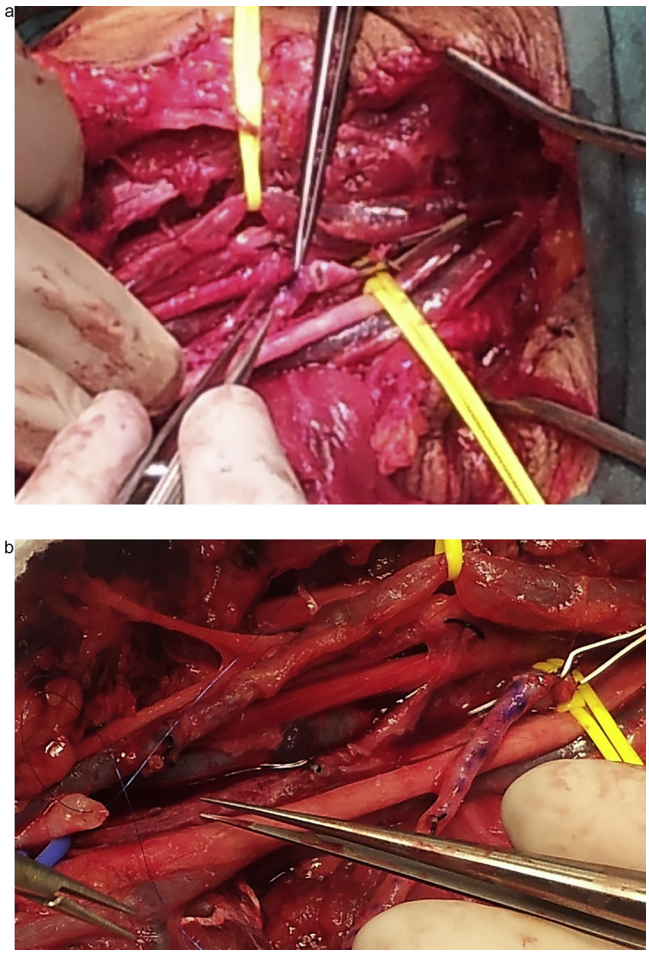

Fig. 2. a) Starting of proximal arterio venous anastomosis using autogenous reverse vein graft. b) Completed proximal arterio venous anastomosis using autogenous reverse vein graft.

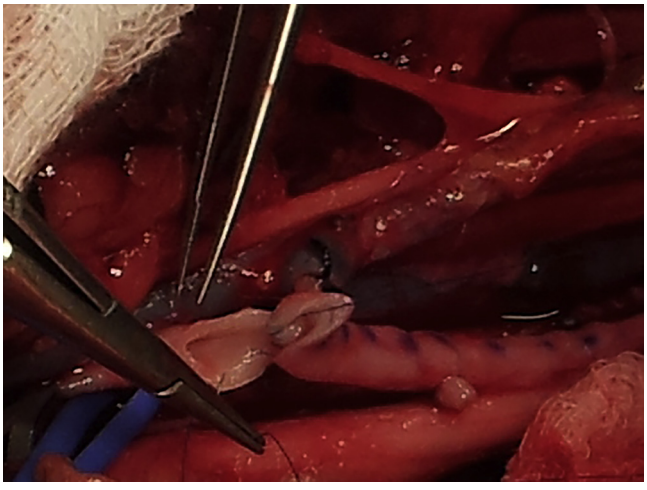

Fig. 3. Distal arterio venous anastomosis using autogenous reverse vein.

wrist drop of right hand and no right radial pulse, coolness to limb, and pallor of the palmer surface of the right hand, on arrival at the Accident and Emergency. Hand-Held Doppler examination noted no recordable signals at the right radial, ulnar and brachial arteries.

The right axilla was explored, via an incision along the deltopectoral groove and onto the chest wall to isolate the axillary artery. The axillary and brachial arteries were isolated and the axillary