

Camel Bites – A Unique Experience

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Abstract

Introduction: Camel bites injuries are occupational and seasonal hazards which can cause serious limb, neck and chest injuries, potentially threatening the vascularity of the limbs with skin and soft tissue injuries. Proper health education of the people involved in handling camels and precautions and protective mask to camel's mouth during late winter and early summer can avoid these injuries. Proper referral, urgent revascularization can restore the vascularity of limb and prevent limb loss.

Material and methods: We from the Department of CTVS, Sawai Mansingh Medical College and Hospitals, Jaipur, Rajasthan, India carried out a study of all the camel bite cases those presented to us or were referred to us for vascular and thoracic injuries, the factors that were responsible for the bite, its treatment and consequences were fully analyzed and studied.

Observations: Between August 2008 to December 2013, 31 cases of Camel bite were encountered, out of which 23 cases were arterial injuries and 6 were thoracic wall bites and 2 were neck injuries. All were caused by domesticated camels, involved dominant side upper limbs/neck in 17 out of 23 arterial injury cases, dominant side of chest wall in 4 out of 6 thoracic wall bites, all bites were unprovoked, occurred during work or feeding, seasonally most occurred between december to march (during late winter and early summer) which can be co-related to mating season of camels.

Results: 100% limb salvage was achieved with end to end repair in 13 cases and reverse saphenous vein interposition graft in 10 cases, with trunk flap in 2 and latissimus dorsi flap in 1 to give soft tissue cover. One case of Right axillary artery injury was encountered which was treated with subclavian to brachial bypass. 4 thoracic wall bites had hemothorax which were treated with intercostal tube drainage.

Keywords: Camel bite; Vascular injury; Hemothorax; Occupational hazard

Introduction

Animal bites are common in tropical and sub-tropical countries which are predominantly agrarian in nature due to domestication of various animals. Camel bite injuries have been described in the literature, but there are only a few. There are no scientific papers dedicated to vascular injuries caused by camel bite, except a few case series/reports [1-3] and vascular injuries or neurovascular injuries being referred to in a few scientific papers describing camel bite [1-3] without any vascular surgical intervention. Camels are found and used domestically in arid climatic conditions, predominantly in North western India. In the state of Rajasthan which shares Thar desert with neighboring Pakistan, camel is used not just as a mode of transport but also for agrarian use, milk and meat.

Materials and Methods

31 camel bite cases were encountered, 23 cases of arterial injuries and 6 cases of thoracic wall bites and 2 with neck injuries were referred and/or admitted in our department. We studied the profile of these patients, the circumstances of bite, associated injuries, provoking factors, type of repair and functional outcome and outcome of the

surgery, vascular and thoracic. It is difficult to ascertain exact incidence of camel bites since many non-greivous ones are treated at periphery by Family physicians or General surgeons and probably some of the asymptomatic brachial artery injuries can go unnoticed.

Results

Incidence

17 out of 31 cases were encountered between January and March. 4 cases were scattered in May, June and July and 2 in August. 23 were vascular injuries and 6 (4 in January and 2 in August) were thoracic wall bites and 2 were neck injuries (both in January).

Age and Sex

All 31 were males (100%), 3 (9.68%) patients were in the age group of 11 to 20 years, 6 (19.35%) patients were in the age group of 21 to 30 years, 10 (32.32%) were between 31 to 40 years and 9 (29.03%) patients were aged between 41 to 50 years, 3 (9.68%) patient was between 51 to 60 years, lowest age observed was 12 years and highest age was 52 years (Table 1).

Side of injury

19 out of 23 were on Right Side, all were right dominant and 4 were left sided who were right dominant, but working with left upper limb at the time of bite and hence the injury was on the non-dominant side.

S no.	Age group	No. of cases
1	1st decade	0
2	2nd decade	3
3	3rd decade	6
4	4th decade	10 (6 thoracic wall injuries)
5	5th decade	9
6	6th decade	3
	Total	31

Table 1: Persons injured by camel bites

Arteries involved:

- Brachial artery: 17
- Brachial, Radial and Ulnar arteries: 4
- Internal Carotid artery: 1
- Axillary artery: 1

Thoracic wall bites: 6 (4 right and 2 left)

In 17 out of 23 (73.91%) arterial injury cases Brachial artery was involved, among which one also involved Radial and Ulnar arteries and 3 other involved radial and ulnar artery individually. 1 each case of Axillary artery injury and I.C.A. injury were encountered.

Associated bone/Neural injury

No case of fracture was encountered with Camel bites causing vascular injury.

The Extra Cranial I.C.A. injury was associated with dense hemispherical infarct.

The Axillary artery injury was associated with Ulnar Nerve injury (Table 2).

Artery involved	Site of injury/bite	No. of cases
Brachial artery	Arm	17 (4 left ND, 13 Right D*)
Axillary artery	Shoulder and axilla	1 right D*
Internal carotid artery	Neck	1 right D*
Radial and ulnar arteries	Lower arm and proximal forearm	4 right D*
	Total	23

*ND=non dominant, D=dominant.

Table 2: Sites of bites which caused arterial injury.

Management

22 out of 23 arterial injury cases underwent surgical treatment. 1 case of right sided neck bite who presented with complete occlusion of right I.C.A. with hemispherical infarct was not operated, since he presented after 3 days other neck bite injury did not involved any great vessel.

Out of 22 who underwent surgery, 8 were operated less than 6 hours after injury and the rest 14 were operated between 6 to 24 hrs since most of them were referred from remote areas.

Thorough wound debridement and antiseptic washes were given at the time of surgery. A 3rd generation cephalosporin and aminoglycoside were administered pre and post-operatively. Anti-rabies vaccine was administered post operatively as per standard recommendations. 13 injuries required end to end anastomoses of brachial artery after mobilization, 9 needed RSVG as inter position conduit and 1 axillary artery injury was by passed from sub-clavian artery to brachial artery using RSVG as conduit. All wounds were closed, one required L.D. flap and 2 others required trunk flap and the rest were covered with local mobilization and/or SSG. Axillary artery injury was associated with Ulnar Nerve injury and it was repaired primarily. 22 out of 23 limbs were salvaged with full functions and movements, the ulnar nerve injury which was associated with Axillary artery injury was also salvaged with 80% regaining of neural function at the end of 1 year. 100% limb salvage was achieved. The I.C.A. injury was not revascularised, after multimodality assessment since patient came very late with hemispherical infarct. Thoracic injuries: 6 cases of thoracic wall bite injuries were encountered all were males in 4th decade, 4 were on the right side and two were on the left side, all of them were right dominant individuals, were unprovoked bites, which occurred while feeding the fodder and presented with multiple rib fractures and hemo-thorax, all were treated with intercostal tube drainage. All recovered well but with residual thoracic wall deformity. Figures 1 and 2 for camel injuries.



Figure 1: Camel bite.



Figure 2: Camel bite.

Discussion

The single humped camel (*Camelus dromedarius*) is commonly found in desert regions of north west India, northern part of Africa and middle east Asia. It thrives well in arid zones since it can withstand draught and can live many days even without water.

Male Camel is usually described as docile, passive and indifferent temperamentally but gets aggressive when aroused or when in rut (must, rampant) [4,5] and becomes dangerously aggressive and bites the animal/man even their owner inflicting severe injuries [4]. This aggressive behavior has been correlated with high testosterone levels in the he camel's blood [4]. Studies have shown that even the she camel during estrous (Dec-Mar) are capricious and restless [6]. Both he and she camels have tendency to bite each other during the courtship in rut [4]. The breeding season of Indian camels is between November to March [6].

The strong large and long mandible with incisors and canines at the fore front and the opposite inclination of teeth together make it a deadly weapon with shake less grip. It is not surprising therefore that the resultant trauma was recorded almost exclusively in males, males being the usual handlers. One comprehensive report of camel bite injuries has been recorded [1]. The camel unlike other horned animals or elephant does not have horns/tusks and trunks for defense and offence; neither do they kick the aggressors. The organ or mode of defense is its strong jaw with pointed and hooked canine teeth which inflicts terrible injuries [7]. The upper canines or tushes are the largest and when fully grown are inclined backwards giving them a wicked look. Correspondingly the lower canines are inclined forwards.

Majority of arterial injuries 17 out of 23 (73.91%) were observed during 1st 3 months of the year (Jan-Mar) the other 4 were scattered in May, June, July and 2 in August. The seasonal variation is very well known locally and corresponds to the mating season that is in winter. In general the sober male camel [6] becomes irritable, aggressive and aroused during December to March and inflicts severe injuries by its bite. The threshold for its aggressiveness and bite is decreased as such in breeding season and prolonged dehydration or hunger or minimal aggressive behavior by the master or the handler and unfamiliar person can further decrease the threshold and lead to its bite [1]. Most bites are single bite unlike canine bites which are multiple. Wound

externally has 2 appearances 1. Only puncture marks 2. Extensive skin and soft tissue injury. Although the 1st variety looks simple because of characteristics of its jaw, the soft tissues are crushed and damaged tremendously devitalizing them. 2nd variety is due to its grip and side to side movement of its jaws and jerky movements of the neck which avulses the soft tissue and skin from its attachments. This is more severe and almost all the soft tissue and skin and other structures that get struck between the jaws not only gets avulsed but also crushed badly and devitalized, leaving a large skin and soft tissue defect over neurovascular structures and/or leading to traumatic amputations [1,2].

After debridement and vascular surgery these require vascularised flap covers to prevent them from getting infected and avoid blowouts and limb loss. Although neural injuries and compound fractures are documented in literature albeit a few [1], in our series no fractures were encountered.

In our study 25 out of 31 bites were on the dominant side, associated with handling and controlling, while thoracic bites occurred during feeding the fodder, the commonest age group observed were in their 4th and 5th decade which is the productive male adult group involved in the profession exclusively. When compared to series of Saxena et al. [1], brachial artery injury was the commonest one injured in 88% of arterial injuries, but no cases of traumatic amputation or bony injuries were not encountered (or probably treated at primary level) or VIC or gangrenous limb/finger or limb loss were not observed due to revascularisations.

Summary

Camel bites are common in arid and desert regions where they are reared for agriculture, domestic, transport, dairy and defense purposes but are less documented in literature. Arterial injuries caused by camel bites are just mentioned in very few case reports and in animal bite case series/reports. All arterial injuries are severe due to its sharp canines or due to avulsion caused by side to side movements of jaw and complementary jerky neck movements. They require aggressive early surgical treatment in the form of antiseptic lavage, debridement, mobilization and excision of contused artery and end to end anastomoses or RSVG interposition graft and restoration of vascularity with skin and soft tissue cover/flaps in severe cases. Most bites occurred when trying to control the camel with dominant upper limb pulling the nose rope.

It can also be concluded that even after 6 hrs and up to probably 24 hrs, the upper limb arterial injuries can be repaired since most were infra profunda brachii (which will partially perfuse the limb through anastomoses around the elbow) and limb salvaged with good functional outcome.

Also important would be designing any protective gears over dominant upper limb and neck to prevent bites to be worn by the handlers and the probable use of rigid masks or some kind of gears that can prevent camel from opening its jaw without hampering its respiration. It is of immense importance to give occupational training to the camel owners and handlers to handle with compassion, avoid torture, prolonged dehydration and starvation during winter and early summer months i.e. during breeding season so as to decrease the incidence of camel bite in general and arterial injuries in particular.

In the coming years of awareness regarding health insurance it will certainly justify to be an occupational hazard/injury with its

consequences of claims and compensation and also subscription of insurance policy.

References

1. Saxena PS, Sharma SM, Singh M, Saxena M (1982) Camel bite injuries. *J Indian Med Assoc* 79: 65-68.
2. Janjua KJ (1993) Camel bite injury: an unusual report of left shoulder mutilation with major vascular and bony injuries. *Injury* 24: 686-688.
3. Al-Boukai AA, Hawass NE, Patel PJ, Kolawole TM (1989) Camel bites: report of severe osteolysis as late bone complications. *Postgrad Med J* 65: 900-904.
4. Yagil R (2006) Reproductive processes in Camels. *Israel J. of Veterinary Med* 2: 2.
5. Yagil R, Etzion Z (1980) Hormonal and behavioural patterns in the male camel (*Camelus dromedarius*). *J Reprod Fertil* 58: 61-65.
6. Mukasa mugerwa E. The Camel (*Camelus dromedaries*): A bibliographical review. *ICLA Monograph* pp: 17-20.
7. Lensch J The two humped camel (*Camelus bactrianus*): *FAO Corporate document repository* pp:5.