Case report: Pathetic story of a camel skeleton

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Abstract

A reconstituted skeleton from cleaned bones obtained from an abandoned camel carcass, showed calluses of 18 healed (13 complete and 5 incomplete) fractures at the following sites: I) Seven complete rib-shaft fractures: above their sternal ends. II) Four complete lumbar vertebrae spine fractures. III). A complete spiral fracture separating the left wing of sacrum from its body. IV) A complete spiral fracture at the ilio-ischial junction: extending into the acetabulum. V) An incomplete 5 lumbar vertebrae spine fracture. VI) Two incomplete tips of the transverse fractures of 4 and 5 lumbar vertebrae. VII) A healed ilio-pubical junction fracture. VIII) A compression fracture of first thoracic vertebral arch. Probable causes of these many broken vertebrae and ribs of one who looked like a work animal are not easy to guess. Some of the possibilities are however, discussed. The man who drove the cart pulled by the camel was not its owner because owner of an animal can never be that ruthless. There is a dire need that activity of the existing Society for the Prevention of Cruelty to Animals (SPCA) in the country be revived, encouraged and strengthened. Society's scope should be further enhanced by including welfare of animals in its functioning.

Keywords: Skeleton, camel, fractures, ribs

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Introduction

Although it appears otherwise, bones are living organs of the body which require nutrients, undergo molding and remolding processes and show effects of age, malnutrition, as well as, trauma. The latter leads to a partial or complete dissolution of the continuity of bone called "Fracture". A broken bone is able to bridge the line of fracture with new tissue. This repair mechanism is activated immediately after an injury but complete recovery may take weeks or months. Obviously, all this depends on the extent of damage, age and health condition of the recipient, as well as, proper treatment and aftercare.

Although bones do not tell lies, deformed bones or their calluses alone are not substitutes for a complete post mortem examination. Only a specialist can understand their language or translate such sketchy and inconclusive evidence into a meaningful whole. Circumstantial evidence, therefore, will have to be taken into consideration in this case report. The aim of this study was to elucidate the type and degree of damage wreaked to a camel during cart pulling by various reasons like overloading, poor cart design and rough infrastructure etc and to recommend appropriate remedial measures.

Materials and methods

The skeleton under study was reconstituted from the bones of an abandoned camel carcass obtained from the bone collection center at Bhakkar Road. This is a large outfit with about half a dozen sub centers in a radius of about 100 Km all around Jhang. Vultures and dogs usually spread all sorts of forsaken carcasses in different stages of laceration, decomposition and disintegration there. A completely denuded skeleton of an adult camel found lying in disarray on the ground, was taken to the College of Veterinary and Animal Science (CVAS) Jhang and macerated in cold water at about 90°F for five months. Its bones were then scrubbed, cleaned and soaked in 0.5 percent commercial carbolic acid aqueous solution for four days and finally sun dried. As none of the bones was found completely broken or missing except the sternum, it was decided to construct it, .for teaching/demonstration purposes.

Illustrated Anatomy of Dromedary by Smuts and Bezuidenhout (1987) was used to identify individual bones and landmarks as it is always a great help in the study and identification of bones.

Camel carts which ply in the outskirts of Jhang are generally 30 to 35 meter long, up to 1.8 meter wide and around 1.0 meter high wooden platforms, fitted with four pneumatic tyre wheels. Unlike the fixed bamboo shafts of two-wheel carts drawn by the equines, the movable wooden or iron shafts of the camel carts are suspended in front from the wooden frames of the main harness by an iron hook (Fig. 1). Their other end is attached behind to an improvised mechanism which when pushed sideways turns the fore wheels and the cart to the right or left. As there is no provision of mechanical brakes, the stoppage, as well as, turns is maneuvered mainly by the camel, who negotiates it via the shaft and the turning mechanism. The onus of these skillful maneuvers, if not properly guided by the cart-driver, lies mainly on the

camel, who has to bear all the brunt. In the neighboring Faisalabad, the camel-carts are similar yet 1.5 to 1.8 meter longer, sturdier and fitted with heavier iron pipe shafts. Their camels are also larger and stronger. Therefore, they carry much heavier loads on the smooth city roads. However, the harnesses used at both places are identical. Apart from performing different odd jobs in the field; camel carts can haul 3000 to 5000 kg of sugar-cane on metaled roads to the nearby Shakar Ganj Sugar Mills, Jhang. A camel cart of Tando Allahyar Khan district in Sindh has reportedly carried 17,000 kg of sugar-cane to Mehran Sugar Mills covering a distance of about 7 kms (Khan, 2009). The main harness consists of two 35 cm wide and 40 cm high wooden frames, which are joined above at an angle of about 80°. These frames are fitted in front of the hump on either side of the thickly padded withers (Fig. 1). The padded collar does not allow the frames to slip back, while what looked like the breast band and the crupper do not let it move forward. The free front-end of each shaft is hung by an iron hook with the wooden frame. Parts of the harness which come in contact with the body are usually padded with whatever is available. The overall condition of the harness is obviously far from satisfactory.

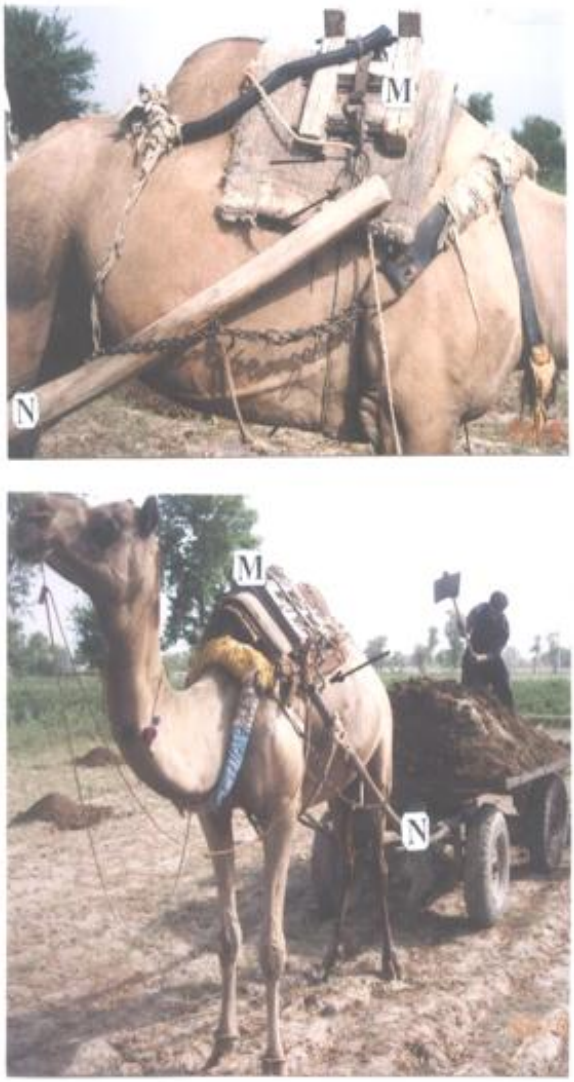

Figure 1. The Cart and the Harness
M= Wooden Frame; N = Shaft
Top: A close look; lateral view
Bottom: The whole outfit in a field; front view
1. The shaft is suspended to the wooden frame by an iron hook, and 2. An iron chain accompanies and supports the shaft.

Results and Discussion

All the 18 fractures observed on the camel skeleton under study were listed in Table 1 and illustrated in Figs. 2 to 5. None of the bones of skull or limbs was found broken.

The seven rib-shaft fractures were all of complete type because each involved the entire cross-section of the affected bone. Their calluses were, therefore, as wide as the affected rib-shaft. However, the heights of these calluses ranged from 6 to 8 cm: except rib VI-R, which was 11cm and rib VII-R, which was only 4 cm high. Rib VI-R showed the largest and the thickest callus. Location-wise, these calluses were 2 to 15 cm above the sternum (Fig. 2).

Table 1. List of fractures/calluses

No.	Site	Callus Description
		Rib-shaft Fractures (Fig.2)
1	Rib VI-L	A bilateral, medially more distinct, 8cm long callus;
		about 8cm above its sternal end.
2	Rib III-R	A bilateral, medially more conspicuous, 7cm long callus;
		only 2cm above the sternal end.
3	Rib IV-R	A 6cm long bilaterally inconspicuous callus;
		about 7cm above its sternal end.
4	Rib V-R	A 7cm long bilaterally thickened callus;
		15cm above the sternal end.
5	Rib VI-R	A 11cm long large, thick, bilateral callus;
		6cm above its sternal end.
6	Rib VII-R	A medially, more prominent, 4cm long callus;
		about 10cm above the sternal end.
7	Rib VIII-R	A bilaterally least conspicuous, 8cm long callus;
		about 4cm above the sternal end.
		Lumbar Vertebrae Fractures (Fig. 3)
		(a) Fractures of Spinous Processes
8	Vert. L	The first four lumbar vertebrae showed:
9	Vert. L	complete fractures around the middle of their spines: which
10	Vert. L	enlarge gradually from the 1 to the 5 Vert. and so do the
11	Vert. L	fractures.
12	Vert. L	Callus was visible only on the right side of the spine.
		(b) Transverse fractures of left Transverse Processes
13	Vert. L	Slight ventral roughness, 14cm away from the vertebral body.
14	Vert. L	A 2x2cm ventral callus; 12cm away from the vertebral body.
		Pelvic Fractures
15	Left sacral	A wavy gap is visible all around the complete spiral fracture
	wing	which separated the left wing from the rest of the sacrum (Fig.4)
16	Os Coxae l	One complete spiral fracture around the ilio-ischial junction,
		which extended into the acetabulum (Fig.5 Bottom)
17	Os Coxae II	Ilio-pubical junction was also broken but healing was so
		perfect that no gap existed between the broken ends.
		A Compression Fracture (Fig.5 Top)
18	Vert. T	What looked like a barely visible compression fracture was
		noticeable on either side of its spinal base

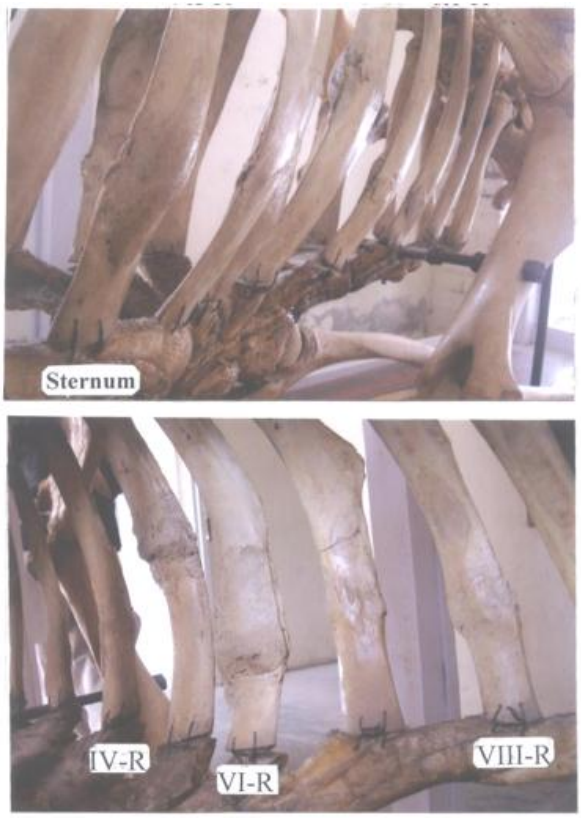

Figure 2. Right Thoracic Wall
Top: Lateral View: Shows bilateral calluses of variable dimensions in ribs III-R to VIII-R
Bottom: Medical View of the same: showing calluses in ribs III-R to VIII-R

Figure 3. Lumbar Vertebrae Fractures
Top: Right Lateral View; Shows complete spiral fractures of Vert. L1 to L5 spines.
Middle: A closer view of the same; Showing Vert. L1 to L3
Bottom: Ventral view of their Left Transverse processes; Vert. L4 and L5 tips show incomplete transverse fractures.

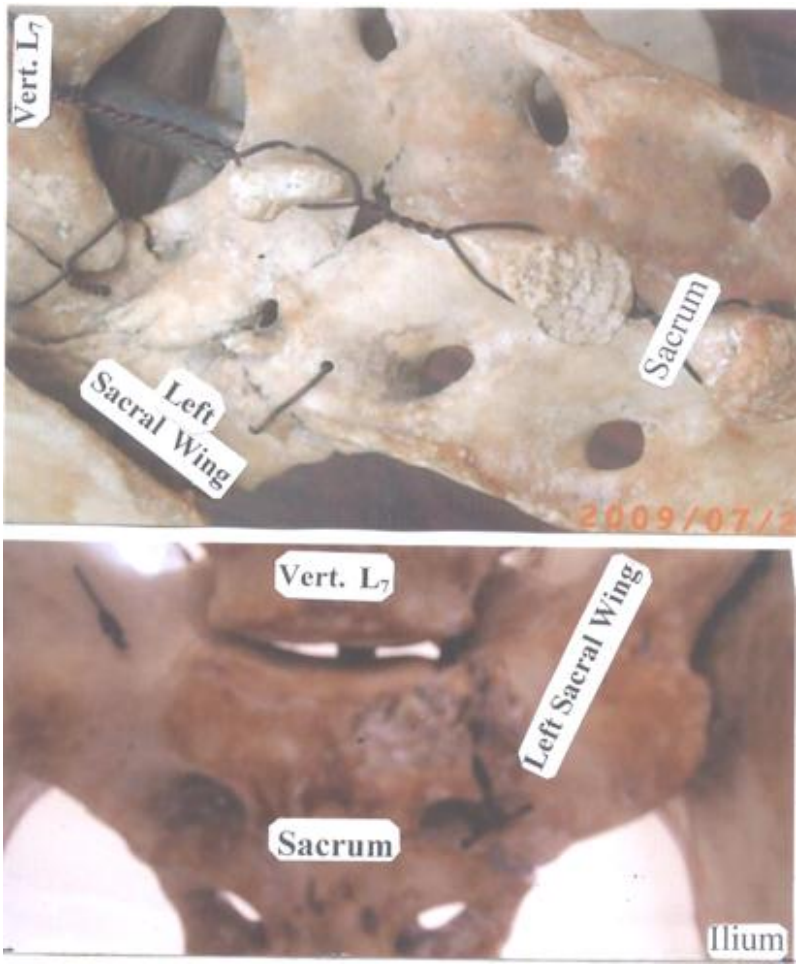

Figure 4. Broken Left Sacral Wing; Showing separated left wing of the sacrum; a complete spiral fracture
Top: Pelvic roof; Dorsal View
Bottom: Ventral View of the same

Figure 5.
Top: Left lateral view of Cervico-thoracic Junction; on either side of Vert. T_1 spine, the arch shows a wavy scar
Bottom: Dorsal view of Left Hip Joint; shows a complete spiral facture, which extends into the acetabulum

Complete fractures of the first four lumbar (L) vertebral spines appeared in a straight line, increasing in size gradually from the first to the fourth. However, fracture of L5 spine was inconspicuous on the left side. Broken tips of the left transverse processes of the lumber vertebra (L4 and L5), showed only a slight ventral roughness (Fig.3, bottom). Hence these were adjudged as incomplete transverse fractures.

Two of the three pelvic fractures were most conspicuous: showing a gap between the fractured ends. Left wing of the sacrum was completely separated from its body. The ilio-ischial junction fracture was likewise apart extending into the acetabulum (Fig. 4 & 5). Yet the ilio-pubic fracture had perhaps healed so well that no scar left at the site. Thoracic vertebral (Vert. T) arch showed a barely visible compression fracture.

Generally speaking, fracture is a partial or complete breaking of a bone or a cartilage, which is mainly caused by accidents due to trauma. The trauma and the accompanying inflammation with all its manifestations make it obvious either by:

i. Deformity, e.g., displacement of fragments,
ii. Malfunction, like inability to bear weight, or
iii. Abnormal motility, e.g. crepitation etc.

In other words, dissolution in the continuity of bone, with or without the displacement of fragments, is a complete fracture (Kumar, 1999).

In normal healthy animals, immediate clotting of blood, preventing further bleeding, marks the beginning of fracture healing. Within days embryonic tissues, e.g., fibroblasts, osteoblasts, etc., appear on the scene, which try to abridge the gap with the bone callus. After about two weeks spongy bone is also deposited on the callus which will not only fills the gap but also stabilizes the broken ends. Finally, when the callus becomes hard it retracts.

O'Connor (2005) observed: The greater the amount of separation between the fragments the larger is the callus.

When the separation is slight the callus becomes imperceptible after several months.

Heavy, often repeated, pressures applied to the skeleton may produce lesions known as stress or fatigue fractures. The bone in question becomes painful and tender yet the fracture is nearly always incomplete. This is why it remains invisible to the radiograph until a radio-dense callus is formed (Baily et al., 1984).

In spite of all-round mechanization, camel cart has so far not become totally fade. Short distance transportation of heavy yarn beams, machinery etc. from one city to the other is still carried by four wheel brakeless camel carts. The biggest hazard is their quick maneuvering on the busy city roads. A sudden stoppage hells heavily on the camel, which has also to halt an overloaded cart behind him in momentum. The resultant pressure on breast band, crupper and the loose shaft can all hurt the nearby muscles and bones specially those of the chest wall with

which the suspended shaft is hooked. If such a strain and stress are repeated at every corner, the damage may add up to enormous proportions.

As indicated earlier the origin, life style and death of the camel under consideration, are all not known. It is, though, assumed that it lived as a work animal, pulling a cart of the type in vogue in the vicinity, then this may somewhat explain why all the fractures on the skeleton under study were confined, either to

i. Around the main harness, i.e., the back, or
ii. Along the loose end of the shaft i.e., the side of the chest, and
iii. On the bony pelvis, which along with the hind limb takes all the brunt of frequent stopping and turning. Yet the precise circumstances and plausible causes, which resulted in various types of so many fractures, are not easy to guess.

Conclusion and recommendations

It is conceivable from such a clear-cut case of cruelty to the animal that these cases be brought to the notice of SPCA staff and the field veterinarians at large. Although a lone case of unknown antecedents yet this number of broken bones in one abandoned camel carcass is so alarming that one feels like reminding himself and animal owners at large of their ignored responsibilities towards their ever ready and undemanding help mates. The authors recommend following actions for improvement in existing situation.

1. Pakistan Prevention of Cruelty to Animals Act 1890 (As modified up to the 15th December, 1937), therefore, be given special publicity. **Scope of Society for the Prevention of Cruelty to Animals (SPCA) should be further enhanced by including welfare of animals in its functioning.**

2. This act be made an integral part of a course "Veterinary Jurisprudence and Forensic Medicine" in DVM curriculum.

3. In the light of the findings of the present study, the veterinarians and the SPCA staff in their routine checkup may also look for:

a) Any abscess, weeping wound, broken rib or callus formation on either side of the camel's chest.
b) A repaired or welded shaft or mended harness if left with such an impediment will hurt the animal. and
c) If harness components or padding materials used were creating problems.

4. In order to avoid unnecessary roadblocks and traffic hazards:

a) The weight and more important breadth of a cart-load must not only be commensurate with the stipulation of cart, camel and harness but also match the width, type and condition of the road.
b) Special rules e.g., time restrictions for rush hours and crushing season may have to be framed for this slow moving road monster.

5. There is a dire need to make an in-depth study of in vogue camel carts, their harnesses and the materials of which they

are made by a competent team of specialists who may suggest:

a. Some useful and cheap modifications in their designs, and
b. Thrash the possibility of providing an emergency brake to this brakeless four-wheel camel cart.

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