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Camel bites: report of severe osteolysis as late bone complications

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Summary: Four cases of severe osteolysis of bones subsequent to camel bite are described. The first had osteolysis of the ribs with traumatic diaphragmatic hernia. Two cases had similar appearances of gross osteolysis of the shafts of the radius and ulna, whilst one had osteolysis of the humeral shaft. The similarities in the radiological appearances especially of the gross osteolysis at the site of trauma are noted. The complications following mammal bites are discussed.

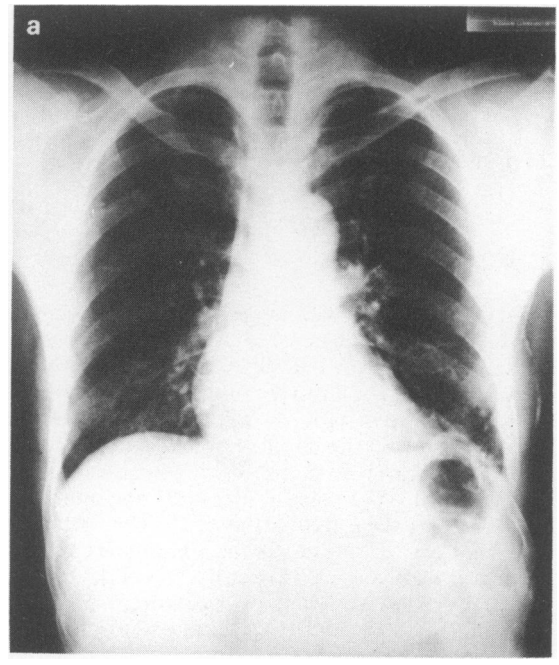
Introduction

The specific radiological effects of trauma caused by certain animals have been documented. Recently cases of acroosteolysis following snake bite and scorpion stings were reported from Saudi Arabia.[1] Camels, the beasts of burden, sometimes bite their owners or handlers. The radiological changes following such bites remain unrecorded. The present documentation is of the complication of gross osteolysis subsequent to camel bites, in 4 patients.

Case reports

Case 1

A 55 year old Saudi male was admitted with a history of pain on the left side of the chest having been bitten by a camel one year ago. He was also complaining of a dry cough for 4 months. Physical examination revealed bulging of the left lower chest wall, at the site of the bite, with a deficient area of chest wall in the posterior axillary line. There was local paradoxical breathing, and flail intercostal movement. Chest X-ray revealed destruction of the left 8th, 9th and 10th ribs, with periosteal new bone formation and some soft tissue calcifications. A small splenic flexure herniation of colon through the mid portion of the left hemidiaphragm was also noted (Figure 1 a, b). At operation the upper and lower flaps of the defects were easily mobilized and the distal parts of the 8th, 9th and 10th ribs were resected. A small diaphragmatic defect was repaired. A mould formed from a myelomesh and acrylic resin base was made to cover the chest wall defect and sutured to the chest wall. Histological examination of resected soft tissues showed fibro-fatty muscular tissue, some of them were necrotic with dystrophic calcifications, sections of ribs showed normal bone with calcified necrotic periosteum.



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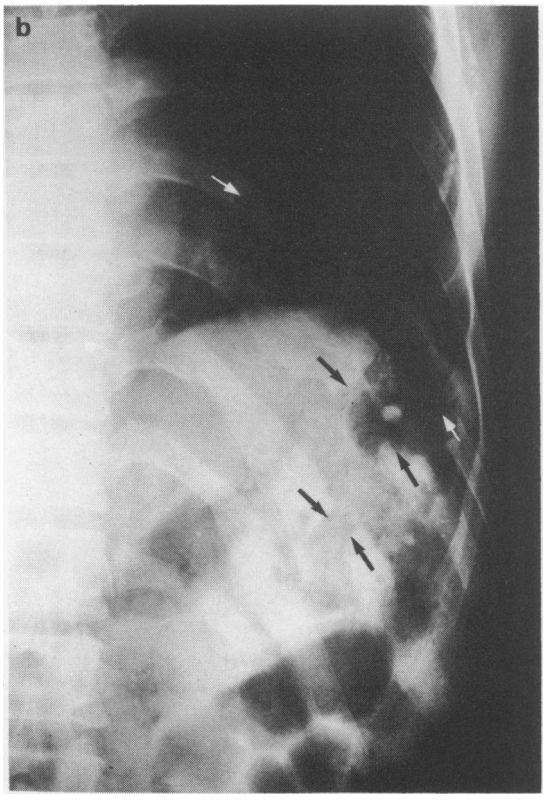

Figure 1 (a) Plain chest radiograph showing destruction of the lower left ribs with partial herniation of the splenic colon through a defect in the left hemidiaphragm. (b) Close up view of the left lower ribs showing severe destruction of the middle third of the left 8th, 9th and 10th ribs (arrows) with excessive periosteal new bone formations at the free ends of 9th and 10th ribs. Soft tissue calcification seen in the region of osteolysis. Note also the guinea-worm calcifications and the herniated colon.

Case 2

A 50 year old Saudi male presented with fever for a few days, with pain and marked skin ulceration at the radial aspect of the mid right forearm for the last 3 months. He gave a history of camel bite of the mid forearm 10 years ago. On examination, there was pseudarthrosis at the middle third of the forearm.

Right forearm X-ray showed osteolysis of the middle third of the shafts of radius and ulna and shortening of the forearm (Figure 2). The ulceration was thought to be due to the tight splint of folk medicine aggravated by a pressure effect of the tapered end of the radius and ulna. The ulceration was treated successfully by antibiotics, release of the splint and skin dressing.

Figure 2 Osteolysis of the middle third of the shafts of the radius and ulna with conical tapered ends of the fragments. Marked shortening of the forearm and generalized osteoporosis of the bones are seen. Note the skin ulceration at the dorsal radial aspect of forearm.

Case 3

A 68 year old Saudi male presented with pain in the right shoulder for more than 3 years, which had increased gradually with some limitation of the movements of the upper limb. The patient had been bitten by a camel 22 years ago on the right forearm which was followed by swelling, redness and oedema; the infection subsided in 2 months with folk medicine. Extrusion of a sequestrum was denied. Physical examination revealed marked shortening and deformity of the forearm. There was also wasting of the soft tissue and muscles of the forearm. Impairment of pronation and supination movements and limitation of the wrist movements were noted. X-ray of the shoulder showed marked osteoarthritic changes. X-ray of the right forearm revealed shortening due to pseudo-arthrosis of radius and ulna (Figure 3).

Case 4

A 54 year old Saudi male with a known history of a camel bite 30 years previously at the mid right upper arm presented his problem when he came to the

Figure 3 Marked shortening and deformity of the forearm due to absence of the middle three-fifths of the shafts of the radius and ulna. The fragments of the radius and ulna have tapered ends opposing each other with marked circumferential thinning of the distal ulnar fragments. A triangular loose segmental fracture of ulna was noted.

Figure 4 Gross absence of almost the entire shaft of the humerus from the supracondylar to the deltoid ridge regions. Note the tapered pointed ends of the humeral fragments as well as hypoplastic humeral head.

hospital for an unrelated respiratory infection hoping for new medical developments in the management of his disabling sequelae. X-ray of the humerus showed an almost complete absence of the humeral shaft with tapering ends of the defective bone. The humeral head was severely dysplastic and flattened (Figure 4).

Paradoxically, the patient showed unexpected strength and mobility in the upper arm. An interesting finding was that the patient was able to gradually shorten his arm to a significant and unexpected degree upon voluntary and gradual contraction of the muscles of his right upper arm.

Discussion

Injury from animal bites is a common phenomenon.[2,3] The animals are either domesticated or non-domesticated such as dogs, cats, bats, bob-cats, foxes, rodents and of course humans.[2,4–6] Various diseases or complications are common sequelae of these bites. Most are of infections from contaminated wounds resulting in gas-gangrene,[2] meningoencephalitis[7] and fevers such

as tularemia and cat scratch disease.[2] Some are due to transmitted infections from the assaulting animal such as rabies from dogs, syphilis from human bites,[2] whilst some may be due to anaphylaxis.[6]

The bones involved in animal bites in descending order of frequency are usually the hands, fingers, arms and legs, and the trunk and face to a lesser extent.[3] Osteomyelitis and septic arthritis as a direct consequence of some of these animal bites are common.[5,8] These infective changes in the bones and joints can be manifested as periostitis, bone erosions, joint swellings and joint space narrowings as seen in changes following human bites.[5]

Bites by camels of human handlers are well-known. Such bites usually occur as the handler raises his arm to pull on the reins of the camels' heads in attempts to make them kneel for mounting. The bites are usually a sudden vengeance for offences committed previously and which might have been forgotten by the handlers, usually in the winter months when the camel becomes wild during the breeding season when in 'wet' or when provoked. 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.[8] In this review of 153 cases of camel bite, 84% were males, and 68% of them occurred during the winter months. The upper limbs were involved in 94% of cases. The injuries sustained varied from deep wounds such as avulsion of scalp, traumatic tracheostomy, gas gangrene to fractures (usually comminuted, with or without neurovascular involvement) and/or amputations. Fractures occurred in 48 cases (31%) while traumatic amputation was seen in only 5 cases (3.3%). Fracture-dislocation of the temporomandibular joint was recorded in another case out of the series. Quoted late complications of these fractures were of delayed union or non-union.

It is not surprising therefore that the injuries involved the upper limbs in 3 of our cases; and these were all severe, but without neurovascular involvement. The complete absence of a major length of the long bones of the limbs could have been due to extrusion of a long piece of sequestrum subsequent to chronic osteomyelitis or post-traumatic osteolysis. The absence of a history of chronic purulent discharge from the site of lesions or of extrusion of bone itself makes the aetiology of these lesions almost certainly due to post-traumatic osteolysis.

Massive osteolysis was first reported in 1838 as spontaneous dissolution of bone, and later in association with angiomatosis, hence the eponym, Gorham's disease.[9] However, massive bone osteolysis has been found in many other disease entities which include infectious diseases such as osteomyelitis, neuropathy,[10] lymphangiectasia,[11,12] neurofibromatosis, metabolic diseases such as hyperparathyroidism; and collagen diseases such as rheumatoid and scleroderma.[13,14] Hereditary osteolysis of an autosomal dominant type, associated with arthropathy has been reported.[15] Some idiopathic ones associated with generalized osteoporosis and skull deformities have been reported in Hadju-Cheney syndrome.[16] Acute inflammatory atrophy associated with trauma still remains one of the causes.[15,17,18] Osteolysis has also been reported as a late complication of snake-bites.[1]

The radiological appearance of concentric shrinkage of the diaphyses with tapering ends is the so-called 'sucked candy' appearance.[15] Progressive osteolysis of the bone fragments as well as of contiguous bones and soft tissue may supervene. These are the features in cases 2, 3 and 4. The similarities in the appearances of the cases are quite striking most possibly because the osteolysis found has a common aetiological basis. Post-traumatic osteolysis, infection and traumatic vascular ischaemia are most probably the main factors responsible for the osteolysis in our cases.

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