

# A SURVEY OF THE INCIDENCE AND PATHOLOGY OF FOREIGN BODIES IN THE STOMACH OF CAMELS (*Camelus dromedarius*) IN IRAN

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## ABSTRACT

The incidence and associated pathology of foreign bodies in the stomach of 200 camels from Khorein slaughter house was studied in Iran. Of the 200 camels, 100 had foreign bodies in their stomach that 83 were male and 17 were female. The type and location of foreign bodies were examined in all of the 100 camels. Totally 220 foreign bodies (112 metallic and 108 non-metallic) were found. The reticulum with 132 cases had the most numbers compared to other compartments. Gravel and stones (34%), and pins and nails (27%) were the most common types of foreign bodies in the stomach of the camels. The most common foreign bodies found in the 3<sup>rd</sup> compartment were gravel and mud. All metallic foreign bodies were found in the reticulum (82%) and rumen (18%). Gross examination of the stomach revealed areas of erythema in the rumen (n=2) and reticulum (n=1). No case of traumatic reticuloperitonitis was observed. Histopathological examinations revealed oedema, hyperaemia and focal haemorrhages. The results suggest that the foreign bodies in the stomach of camels may not play an important role in the pathogenesis of reticuloperitonitis.

**Key words:** Camel, foreign bodies, incidence, pathology, stomach

Ingestion of foreign bodies could be associated with some complications in ruminants. Most important of these complications included oesophageal obstruction (Radostits *et al*, 2007), traumatic reticulitis (Cramers *et al*, 2005) and rumen impaction (Igbokwe *et al*, 2003). Lack of discrimination by cattle leads to the ingestion of foreign bodies that would be rejected by other species (Radostits *et al*, 2007). It is generally conceded that sheep and goats, because they are delicate and selective feeders, are substantially less notorious than cattle for ingesting foreign bodies (Hailat *et al*, 1998). Camels are browsing herbivores and this makes them less prone to ingestion of foreign bodies as compared to other ruminants (Gameel *et al*, 2000). In an abattoir survey of the gastrointestinal tract of 1491 slaughter cows in Denmark, foreign bodies were found in 16% of the cows and foreign body lesions were present in 10% of the cows (Cramers *et al*, 2005).

There are few reports concerning the frequency and types of foreign bodies in the stomach of camels. The incidence of foreign bodies in the stomach of 337 camels was surveyed by Gameel *et al* (2000). They found that 40% of the camels had foreign bodies in the rumen and reticulum, and most of these foreign

bodies were non-metallic objects. An abattoir survey on the incidence of foreign bodies in camels in Iran indicated that 26% of the 1000 camels had metallic foreign bodies in their stomach (Hekmati *et al*, 1978). Fahmy *et al* (1995) investigated 703 camels at Cairo abattoir and found that 31% of the camels had foreign bodies in their stomach. The stomachs of 150 camels slaughtered at the Giza abattoir were examined and metallic objects were encountered in the reticulum of 9 (6%) camels (Said, 1963). Accidental ingestion of a knife (Purohit *et al*, 1982) and a cast iron harrow (Gahlot *et al*, 2006) in camel have been reported.

The aim of this study was to investigate the frequency, types, locations and pathology of foreign bodies in the stomach (3 compartments) of camels at Khorein abattoir in suburbs of Tehran, Iran.

## Materials and Methods

The study was carried out on 200 camels of both sexes and various ages at Khorein slaughter house in suburbs of Tehran. Stomachs of these 200 camels were examined immediately after evisceration. All stomach compartments were opened and investigated thoroughly for presence of foreign bodies. The type and location of foreign bodies were examined and

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gross lesions were characterised macroscopically. Tissue specimen from the stomach walls were fixed in neutral buffered 10% formalin, processed, and sectioned. Tissue sections were stained with haematoxylin-eosin, and prepared for histological examination.

## Results

Stomach compartments of 200 camels (155 male and 45 female) were examined for presence of foreign bodies. Of the 200 camels, 100 (50%) had foreign bodies in their stomach that 83 were male and 17 were female (Table 1). A total of 220 foreign bodies (112 metallic and 108 non-metallic) were found. The reticulum with 132 cases had the most numbers compared to other compartments. The most metallic foreign bodies obtained from the reticulum and the most non-metallic foreign bodies recovered from the rumen (Table 2). The most common foreign bodies found in the abomasum were gravel and mud. Camels above 7 years old had the most frequency of foreign bodies (63%) in their stomach.

The types of the foreign bodies obtained includes gravel and stones (n=74, 34%), pins and nails (n=60, 27%), wires (n=12, 5%), metallic stoppers (n=11, 5%), undeterminable sharp metallic objects (n=10, 5%), glass (n=8, 4%), undeterminable blunt metallic objects (n=7, 3%), ropes (n=6, 3%), cloths

(n=4, 2%), plastics (n=4, 2%), pieces of bone (n=4, 2%), mud (n=4, 2%), needles (n=3, 1%), coins (n=3, 1%), metallic plugs (n=3, 1%), plastic strings (n=2, 1%), screw (n=1, 0.4%), metallic plate (n=1, 0.4%), metallic washer (n=1, 0.4%), bezoar (n=1, 0.4%) and belt (n=1, 0.4%).

Gross examination of the stomachs revealed areas of erythema in the rumen (n=2) and reticulum (n=1). None of the sharp or pointed foreign bodies were penetrating the wall of the reticulum and or the rumen and no case of traumatic reticuloperitonitis was observed. Histopathological examinations revealed oedema, hyperaemia and focal haemorrhages.

## Discussion

The incidence of foreign bodies in camels in Iran is substantially higher compared to figures published in other countries (Fahmy *et al*, 1995, Gameel *et al*, 2000). This is most likely due to the increasing pollution of grazing lands by pins, wires, glass, ropes, cloth and plastics. In arid countries such as Iran, a shortage of forages during the long dry season, also increased the likelihood of ingestion of foreign bodies (Hailat *et al*, 1997). Sand is consumed when it becomes mixed with hay fed on the ground, camels graze grass covered by silt after flooding, they graze the roots and attached soil of plants uprooted in short or overly grazed pastures and when they drink from shallow muddy pools at the time of fresh water unavailability (Raoofti *et al*, 1996). It is also possible that some camels ingest the foreign bodies through pica. Pica is associated in most cases with dietary deficiency, either of bulk or, in some cases, more specifically fiber, or of individual nutrients, particularly salt, cobalt or phosphorus (Radostits *et al*, 2007). It is considered as normal behaviour in rabbits and foals, where it is thought to be a method of dietary supplementation or refection of the intestinal bacterial flora (Radostits *et al*, 2007). Occasionally, unattended or starved camels may ingest indigestible objects especially, where they gain access to garbage or dumping places (Gameel *et al*, 2000). Foreign bodies can also be consumed with food such as strings, ropes and plastics used for binding hay, covering, wrapping or holding various feed materials (Gameel *et al*, 2000).

This study indicated an increased frequency of foreign bodies with increasing age of camels. The older the camels, the greater is the exposure to foreign bodies and presumably, the greater potential for ingestion of foreign bodies. Gameel *et al* (2000) reported that young camels frequently ingest foreign

**Table 1.** Frequency of foreign bodies in the stomach of camels, according to age and sex of camels.

Age (year)	Sex				Total	
	Male		Female			
	No	+ve (%)	No	+ve (%)	No	+ve (%)
<4	6	1(17%)	6	1(17%)	12	2(17%)
4-5	30	15(50%)	24	8(33%)	54	23(43%)
6-7	68	34(50%)	14	8(57%)	82	42(51%)
>7	51	33(65%)	1	0(0%)	52	33(63%)
Total	155	83(55%)	45	17(38%)	200	100(50%)

**Table 2.** Frequency of foreign bodies in the stomach of camels according to location and type of foreign bodies.

Location	Type		Total (%)
	Metallic (%)	Non-metallic (%)	
Rumen (Compartment 1)	20 (18%)	58 (54%)	78 (35%)
Reticulum (Compartment 2)	92(82%)	40(37%)	132(60%)
Abomasum (Compartment 3)	0(0%)	10(9%)	10(5%)
Total	112(100%)	108(100%)	220(100%)

bodies. They found that 44% of the camels less than 2 years old and 47% of the camels between 2-5 years old had foreign bodies in their stomachs.

In the present study, most of the foreign bodies recovered were metallic ones and obtained from the reticulum. This is consistent with previously reported results by Hekmati *et al* (1978). They investigated 1000 camels and found 1330 metallic foreign bodies that most of them (67%) were in the reticulum. Gameel *et al* (2000) detected 0.7% of the foreign bodies in camel stomach metallic objects. Fahmy *et al* (1995) also obtained metallic objects in the stomach of 4% camels they examined. This indicates that the pollution of grazing lands by metallic objects in Iran is higher compared to other countries.

In present study, most of the metallic foreign bodies were found in the reticulum, but none of them penetrated to the reticular wall. This is in agreement with that reported by Hekmati *et al* (1978). In this respect, one case (0.3%) of traumatic reticulitis caused by a penetrating wire was reported by Gameel *et al* (2000). Fahmy *et al* (1995) examined 703 camels at Cairo abattoir and only in one case, traumatic pericarditis was detected. The incidence of traumatic reticuloperitonitis is common in cattle and is low in sheep and goats (Radostits *et al*, 2007). In the Danish abattoir survey of cows, foreign body lesions were present in 10% of the cows (Cramers *et al*, 2005). The low incidence of traumatic reticuloperitonitis in camel might be explained by the fact, that the wall of the reticulum is thicker than that of other ruminants, thus penetration of sharp objects may be prevented by this anatomical barrier, as well as by the conformation of the reticular mucosa (Hekmati *et al*, 1978). However, contractions of the reticulum in camel may be insufficient to push a sharp-pointed object through the wall. It is assumed that the camel's peculiar way of lying down and standing could play a role in decreasing the incidence of traumatic reticuloperitonitis (Hekmati *et al*, 1978).

The position of the impacted material in the rumen is more important than the size and weight of the indigestible foreign bodies in the causation of clinical impaction (Igbokwe *et al*, 2003). Many large and heavy impacted materials in the rumen did not cause clinical impaction except, where the rumino-reticular orifices were partially or completely blocked by the presence of the materials or pressure (Igbokwe *et al*, 2003). The main pathological lesions encountered

in sheep with plastics in their rumens are rumenitis, erosion and focal epithelial hyperplasia (Hailat *et al*, 1997).

The results suggest that the foreign bodies in the stomach of camels may not play an important role in the pathogenesis of reticuloperitonitis.

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