

INCIDENCE OF METACARPAL AND METATARSAL FRACTURES IN GOATS (2020-2023)

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ABSTRACT

Fracture comprises one of the major surgical cases having serious impinge on small ruminants causing lameness. A retrospective study was undertaken on incidence of long bone fractures in reference to metacarpal and metatarsal in goats. Among 893 cases, 344 (38.5%) cases had fracture. Incidence according to the bone involved; metacarpal (28.4%), metatarsal (22.9%), tibia (15.9%), femur (14.2%), radius and ulna (11%) and humerus (8.13%). Fractures with special reference to the age, sex, nature, type, location in metacarpal and metatarsal were taken for the study. The age of animals with metacarpal fracture ranged from twenty days to 3 years and had a mean age of 9 months whereas metatarsal fracture ranged from one month to 2.5 years and had a mean age of 1.2 years. Out of 176 goats with metacarpal (98) and metatarsal (76) fractures, male goats (65.3%) and (68.4%) were mostly affected than female. Open fractures were 33% whereas closed fractures were of 67%. Fracture due to automobile accident in metacarpal (45.9%) and metatarsal (31.5%) was found to be the most common cause of fracture in goats.

Key words: Goat, Metacarpal, Metatarsal, Fracture, Incidence

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INTRODUCTION

Goats are agile creatures, if frightened, they may attempt to jump that

might result in fractures or other injuries. Free ranging goats are mostly attacked by dogs resulting in multiple traumatic injuries including fractures. Capturing the frightened or weary goat by the limb leads to serious fractures or dislocations (Smith and Sherman, 2009). The curiosity and climbing instincts of goats to access feed sources also leads to fracture secondary to struggling. Metacarpal and metatarsal fractures in small ruminants most frequently occurs by severe traction

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during birth, accidents, unintentional falling or jumping, and abuse or beating (Ali, 2013).

MATERIALS AND METHODS

The incidence of metacarpal and metatarsal fractures was studied at Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal, Tamil Nadu from April 2020 - March 2023. The cause of fracture, age, sex, and breed were collected by history. Nature and location of fracture were studied by palpation of fracture site.

RESULTS AND DISCUSSION

A total of 3783 surgical cases of goats were reported from April 2020 to March 2023. Out of 893 cases of orthopaedic involvement, 344 (38.5%) were fracture of different long bones (Table 1). Among the different long bone fractures, special emphasis was given to metacarpal and metatarsal fractures. The etiology, age, sex, breed, nature and location of metacarpal and metatarsal fractures were tabulated (Table 2).

According to the study results, among the fractures of different bones in goats, metacarpal showed highest incidence (28.48%) followed by metatarsal (22 %) and tibia (15.98 %). This may be due to less muscle coverage in metacarpal and metatarsal or due to pulling the animals by limbs while holding them. Mohiuddin *et al.* (2018) in his study observed metacarpal (40%), metatarsal (20%), radial (20%), humeral (10%) and femoral (10%) fractures in goats. Arican *et al.* (2014) also found that fractures mostly occurred on the metacarpal (60.6%) followed by femur (14.9%), metatarsal (7.1%), tibia

(8.8%), radius and ulna (6%) and humerus (3.2%) in his study.

The etiology of fracture due to automobile accident was 45.9% in metacarpal and 31.5% in metatarsal followed by dog chasing was 29.5% in metacarpal and 43.4% in metatarsal, beating 14.2% in metacarpal and 11.8% in metatarsal, fall from height 10.2% in metacarpal and 13.1% in metatarsal. This may be due to free range goat rearing due to lack of space availability where the animals are let free to graze along the roads. The goats first reaction on seeing a dog would probably be fear as it is a prey followed by chasing and biting. This results in traumatic injury as well as fracture.

Young kids aged between 0-6 months reported highest incidence of 64.2% in metacarpal and 47.3% in metatarsal fractures followed by 6-12 months 20.4% and 27.6% respectively. The reports of Mohiuddin *et al.* (2018) also showed a higher frequency of fractures in young ruminants. This may be due energetic and playful nature of young animals, low bone density and immature skeletons (Islam *et al.*, 2020).

The current study revealed a higher incidence of metacarpal (65.3%) and metatarsal fractures (68.4%) in male goats than female (34.6%) and (31.5%). This may be due to their lively natural wandering and masculine behaviour of the male goats. In a retrospective study Randhir *et al.* (2018) also reported higher incidence of fractures (53.34%) in male goats

The incidence study on breed specification of metacarpus and metatarsus

Table 1. Incidence of fracture in different bones between April 2020 - March 2023

Bone	Number	Percentage
Humerus	28	8.13
Radius –ulna	38	11.04
Metacarpus	98	28.48
Femur	49	14.24
Tibia	55	15.98
Metatarsus	76	22.09

Table 2. Age, sex, breed and location wise incidence of fracture

S.No	Parameter	Metacarpal		Metatarsal	
		Number	Percentage	Number	Percentage
1.	Etiology				
	Automobile accident	45	45.9%	24	31.5%
	Dog chasing/bite	29	29.5%	33	43.4%
	Beaten	14	14.2%	9	11.8%
	Fall from height	10	10.2%	10	13.1%
2.	Age wise				
	0-6 months	63	64.2%	36	47.3%
	6-12 months	20	20.4%	21	27.6%
	1-2 years	9	9.1%	12	15.7%
	2-3 years	6	6.1%	7	9.2%
3.	Sex wise				
	Male	64	65.3%	52	68.42%
	Female	34	34.6%	24	31.5%
4.	Breed wise				
	Non descript	52	53.0 %	35	46.0.%
	Kanni	16	16.3%	12	15.7%
	Kodi	5	5.%	3	3.9%
	Salem black	7	7.14%	7	9.2%
	Tellichery cross	18	18.3%	19	25.2%
5.	Nature				
	Closed	72	73.4%	53	69.7%
	Open	26	26.5%	23	30.2%
6.	Location				
	Proximal third	23	23.4%	26	34.2%
	Diaphysis	48	48.9%	40	52.6%
	Distal third	27	27.5%	10	13.1%

fractures revealed non-descript breeds had the highest frequency of metacarpal (53%) and metatarsal (46.0%) fracture followed by Tellichery cross breed 18.3% (metacarpal) and 25.2% (metatarsal). This may be due to increased population of nondescript breeds in Namakkal district. Mohiuddin *et al.* (2018) also revealed a higher frequency of fractures in local breeds as a result of their excessive jumping and playing nature.

Regarding location of fracture, diaphyseal fractures recorded highest incidence in metacarpus (48.9%) and metatarsus (52.6%). Similar results were observed by Kumar (2017) and Singh *et al.* (2017) in their study. This may be due to less musculature over the bone.

CONCLUSION

Analysis of the data in this retrospective study showed that young (<6 months), non-descript, male goats are prone to closed, diaphyseal metacarpal and metatarsal fractures.

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