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Short Paper

Idiopathic lingual fossa ulcer in cattle in Iran

Taghipour Bazargani, T.[1]; Movassaghi, A. R.[2*] and Bakhtiari, J.[1]

[1]Department of Clinical Sciences, School of Veterinary Medicine, University of Tehran, Tehran, Iran; [2]Department of Pathobiology, School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran

[*]**Correspondence:** A. R. Movassaghi, Department of Pathobiology, School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran. E-mail: armov@um.ac.ir

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Summary

Disease agents that principally target the tongue are relatively rare. It seems that type of food and roughage play an important role to predispose the animals to lingual ulcers. During a period of four years different aspects of cattle lingual fossa ulcer were studied in a semi-industrial dairy farm in Tehran. The affected animals showed various stages of ulcer formation in their lingual fossa. Histopathological examination revealed parakeratotic hyperkeratosis, spongiosis and hydropic degeneration of the epithelial lining. There were also coagulative necroses associated with heavy infiltration of neutrophils in muscle fibers of the tongues. Some cases showed granulomatous reaction with the proliferation of connective tissue. Progressive lingual ulcers were induced in three calves following close exposure to the affected animals. Based on these findings, the disease was diagnosed as idiopathic contagious lingual fossa ulcer in cattle.

Key words: Lingual fossa, Ulcer, Cattle

Introduction

Disease agents that principally target the tongue are relatively rare (Gelberg, 2001). The mucous membranes of the lips, oral cavity, gingiva, tongue and oropharynx, are repeatedly subject to varying degrees of trauma. This is due to their location at the entrance to the alimentary tract and their role in mastication and transport of foodstuffs and other objects of varying consistencies to the lower parts of the alimentary tract. In herbivores, the coarse nature of pasturage and roughage and foreign objects that may be inadvertently ingested with them can cause laceration and abrasions of the mucosa (Jones *et al*., 1997). Laceration of the tongue can result in complete or partial severance of the organ with the severed portion protruding from the oral cavity (Radostits *et al*., 2000). This paper describes epidemiological findings, clinical signs and histopathological features of lingual fossa ulcer in cattle.

History and clinicopathological findings

For the first time in 1991, outbreak of bovine lingual fossa ulcer was diagnosed in a semi-industrial dairy farm located around Tehran, Iran. The affected cattle were in different age groups, and showed profound lingual ulcer with different diameter on their lingual fossa. In the following years, the disease was identified in cattle in nearly all over of Iran. To conduct an intensive and long-lasting study, the disease was followed up in the dairy farm of Tehran Veterinary School. During a period of 4 years, all aspects of the disease were studied in this farm. Data obtained from this study showed that the disease did not affect calves under 3 months of age and it was not common in calves younger than 6 months, while its frequency increased significantly in older animals (Table 1). The disease was flared first among older cows and then in younger animals which were in contact with older

Table 1: Distribution of the affected animals in the herd from 1995 to 1998

Age groups	1st visit 1 Jan 1995				2nd visit 3 Jan 1996				3rd visit 22 Apr 1998			
	No. A	No. Af.	No. unAf.	Percent of Af.	No. A	No. Af.	No. unAf.	Percent of Af.	No. A	No. Af.	No. unAf.	Percent of Af.
<3 m	21	-	21	0	16	-	16	0	15	-	15	0
3-6 m	17	-	17	0	20	2	18	10	17	3	14	17.6
6-12 m	33	20	13	60.6	32	15	17	47	33	13	20	39.4
12-17 m	12	12	-	100	14	7	7	50	35	32	3	91.4
17-24 m	23	20	3	86.9	20	12	8	63.2	52	48	4	92.3
H.P.C	19	17	2	89.5	21	21	0	100	23	23	0	100
M.C	58	52	6	89.6	65	62	3	95.4	41	41	0	100
M.P.B	37	35	2	94.6	24	12	12	50	-	-	-	-
Total	220	156	64	70.9	212	131	81	61.8	216	160	56	74.1

No. A: number of animals; No. Af.: number of affected animals; No. unAf.: number of unaffected animals; Percent of Af.: percentage of affection; H. P. C.: heavy pregnant cattle; M. C.: milking cow and M. P. B.: meat producing bulls

ones. There was no relationship between sex and the occurrence of disease. The disease had no seasonal trend, although its frequency apparently differed from year to year.

On clinical examination, the affected animals showed tongue rolling. It seems that it is the first sign of lingual fossa ulcer or at least there is some relation between tongue rolling and this disease. In this respect, it is worth mentioning that in one examination on a dairy farm, at least 80% of cattle with the history of tongue rolling had contagious lingual fossa ulcer. The first definitive clinical indication of this disease is the appearance of a lentil-like lesion on the lingual fossa. In the next step, a small usually round ulcer appears on this site after about 2 months. The ulcers measured 2-4 cm in length and 1-2 cm broad. These ulcers start to be wider and deeper. The deepness of the ulcer may frighten the practitioner to pull out the affected tongue (Fig. 1). Based on the deepness of the ulcer, restriction of food intake and the resultant weight loss (about 25%) in young growing affected animals may occur. In some severe cases of the lingual fossa ulcers, presence of food materials especially those of green plants is nearly prominent and remarkable as well. In 64.4% of the affected animals, healing of the ulcer occurred during a period of 7 months. To investigate the possibility of the contagious nature of this disease, in an experimental approach a Holstein crossbred male calf with the clinical sign of the disease, was allowed to be in contact with three healthy native male calves. After two months all healthy calves showed significant signs of the disease with progressive lingual ulcer. No organisms were detected in bacteriologic and mycologic studies. Only in one case a rinderpest-like virus was isolated. This isolated virus was introduced (orally, subcutaneously and intravenously) to 4 unaffected calves but it could not cause lingual ulcer. Tissue samples were taken from 7 affected animals with the age of 6 to 18-month-old. These samples were collected from the early stage of the lesion to well developed ulcers.

Fig. 1: A round deep lingual ulcer with craterous appearance

Histopathological examination revealed parakeratotic hyperkeratosis, spongiosis and hydropic degeneration in the epithelial lining. There were eosinophilic intracytoplasmic inclusion bodies in two cases. Deep ulcers showed coagulative necrosis of striated muscle fibers associated with heavy infiltration of neutrophils (Fig. 2). In some cases, there was granulomatous reaction associated with connective tissue proliferation (Fig. 3).

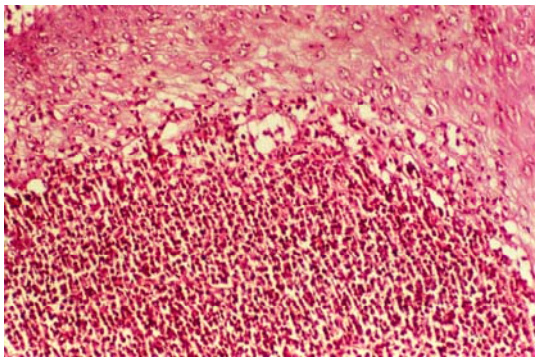

Fig. 2: Spongiosis of the epithelial lining associated with heavy infiltration of neutrophils (H&E, ×640)

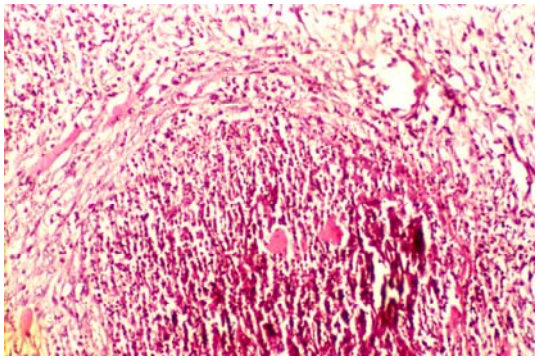

Fig. 3: Pyogranulomatous reaction with multinucleate giant cells (H&E, ×640)

Discussion

It is now quite clear that lingual fossa ulcer is not confined to Tehran, and cattle in nearly all over Iran are affected with different morbidity. Although there is no doubt that this disease has a contagious pattern but in the present study only in one case, a rinderpest-like virus has been isolated. Strains of herpesvirus were isolated from cattle in three dairy herds with the glossitis. From swabs of the lesions or from post-mortem tissue samples of the tongue, the virus was isolated in BFK cells, in which a CPE and Cowdry type A intranuclear inclusion bodies were observed. In serum neutralization tests, the virus was unrelated to the viruses IBR, BVD, FMD (types O, A and C), bovine herpes mammilitis, or Aujeszky's disease (Flammini *et al*., 1985). In a study by Buttenschon (1989), actinobacillosis was found in 2% of the lesions of the corpus as well as the apex of the tongue in slaughtered cattle. There is a relation between primary lesions and actinobacillosis (Buttenschon, 1989). Enzootic ulcer in the back of the tongue in cattle has been reported after feeding by hay containing high amounts of ripe yellow bristle grass (*Setaria glauca*). The panicled parts of the culms were found to be the cause of the massive injuries (Fava *et al*., 2000). It seems that type of food and roughage play an important role to predispose animals to lingual ulcers, so an experiment has been designed to reveal any relation between the type of regimen and this disease. The authors believe that this is the first report of contagious lingual fossa ulcer in cattle.

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