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Osteodystrophia fibrosa in a kid: A case report

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Abstract
Fibrous osteodystrophy is a mineral based metabolic disease of sheep and goat in which bone mineral is resorbed as a result of prolonged hyper secretion of parathyroid hormone. High phosphorus or low calcium in the diet frequently contribute to fibrous osteodystrophy as a result of secondary nutritional hyperparathyroidism. It is most commonly seen in animals consuming high phosphorus diet, diet with a high proportion of bran or other cereal grains are often associated with this disease. Cereal grains have an inappropriate calcium to phosphorus ratio. As a result of low calcium level in circulation, bone resorption of calcium occurs.

Keywords: Fibrous osteodystrophy, bone resorption, secondary nutritional hyperparathyroidism, high bran feeding

Introduction
Osteodystrophia fibrosa is also known as osteitis cystic fibrosa or fibrous osteodystrophy (Nimi PS and Bini J, 2022) [2] is a condition associated with fibrous replacement of resorbed bony matrix. Horses are most commonly affected species and the condition in horse called Miller's disease or Bran's disease (Tejaswini *et al*., 2018) [3]. The main etiology of the disease is continuous and extensive action of paratharmone on bones (Ozmen *et al*., 2017) [4]. Due to resorption, the bony matrix will be seen as radiolucent.

Case History and Observation
A two month old kid weighing 5.6 kg was presented to large animal medicine unit, VCC, VCRI, Namakkal with the history of facial swelling for past one month, bloated abdomen for past one week and treated at local veterinary dispensary with suspension albendazole. On clinical examination animal was dull and depressed with pink and moist conjunctival mucous membrane (Fig.2), bilateral hard facial swelling with open mouth (Fig.1) unable to close the mouth with protruded tongue was present. Rectal temperature was 39.2 degree celsius and heart rate was 89 bpm. Haemato-biochemical analysis revealed neutrophilic leucocytosis (85%), lymphopenia (11%), decreased calcium level (6.1 mg/dl) with marked hypophosphatemia (8.9 mg/dl) which indicated altered calcium and phosphorus ratio of 1:1.5 instead of the normal ratio 2:1 (Radostits *et al*., 2007) [5]. Radiographic examination of lateral and dorsoventral view of skull indicated calcification of zygomatic and maxilla region (Fig 3 and 4). Based on history, clinical signs, radiographic examination, haemato-biochemistry analysis the case was diagnosed as osteodystrophia fibrosa.

Treatment and Discussion
The kid was treated with Injection vitamin AD_3E – 1ml, calcium supplements as tablets and multivitamin syrup. Also advised to provide a balanced feed avoiding bran containing feed stuff. Inspite of attempt in managing the case medically, the kid succumbed to the condition within three days. As it is a metabolic disorder leading to marked bony resorption, insufficient mineralisation of immature bones fibrous connective tissue proliferation and cyst formation (Thompson, 2007) and radiography will show the radiolucence of the bony matrix. Timely treatment is necessary to save the life of the animal. As Vitamin D is associated with calcium absorption, it is important to maintain the level of Vitamin D. The affected animal should be treated with calcium preparations, Vitamin D supplements especially AD_3E and antibiotic to treat secondary bacterial infection if any and anti inflammatories (Akter *et al*., 2018) [1]. Feeding management and long term therapy is the reliable method to prevent the mineral deficiencies.

Fig 1: Bilateral hard facial swelling with open mouth

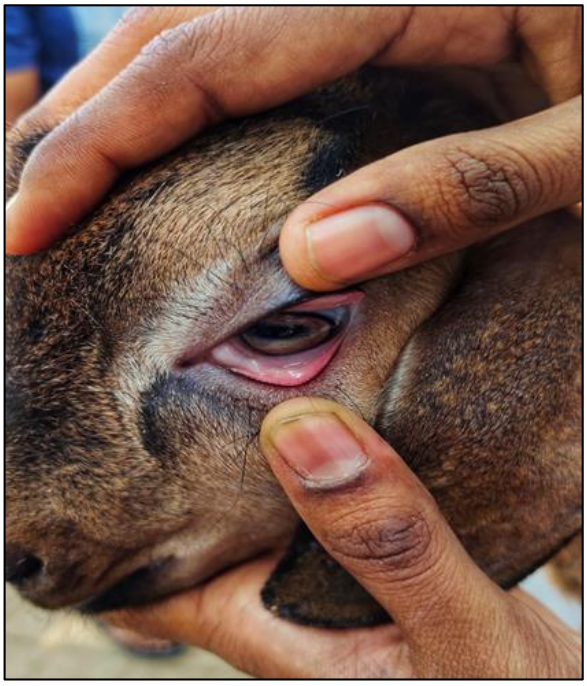

Fig 2: Pink and moist conjunctival mucous membrane

Fig 3: Undifferentiation of skull due to osteitis fibrosa

Fig 4: Uniform osteitis with fibrosa

Conclusion

In ruminants this condition mostly occurs due to diet low Ca:P ratio of 0.8 or lower (Woodard, 1997) [7]. The successful management of this condition mainly depends on the degree or severity of clinical signs (Ozmen *et al.*, 2017) [4]. In late cases prognosis will be poor whereas in early stages, if treated with calcium supplements, vitamins and proper feeding formulations will lead to recovery.

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