

HISTOLOGICAL ABNORMALITIES OF LONG BONES IN DOGS FED RED MEAT ONLY

Dhamia K. Suker & Hassein A. Zeinab
Department of Biology, College of Science, Basrah University
Basrah, Iraq.

ABSTRACT: Littermate domestic house dogs 3.5 months of age were fed red meat only, during a period of six months. Histological examination of diaphysis of experimental animals showed a degradation of Collagen matrix, enlargement of Haversian canal as well as osteolytic lacunae. The resulting bone resorption caused by monotonous red meat diet which is low in calcium and high in phosphorus enhanced NSH disease.

1. INTRODUCTION

Nutritional secondary hyperparathyroidism (NSH) is a major skeletal disease in dog, especially in growing ones. It results from monotonous meat feeding. Meat has a very low calcium content and very unfavourable calcium to phosphorus ratio 1:22 which causes hypocalcemia (Krook *et al.*, 1963, Aurbach and Polls; 1967 and Ham *et al.*, 1940). The morphological changes in this skeletal disease thus constitute a generalized osteitis fibrosa (Saville *et al.*, 1967).

The anamnesis often reveals that foxes with rickets and osteodystrophia fibrosa receive unbalanced diet, consisting mainly of a high horse meat which is unfavorable low calcium to high phosphorus ratio (Gorham *et al.*, 1970). Krook *et al.* (1970) revealed that horses were fed a ration with high phosphorus showed considerable osteocytic osteolysis which is intense in peripheral osteonic lamellar. Hazenwinkel (1987) noted that calcium deficiency elevated calcium levels. The hypercalcitoninemia must have prevented the skeleton from even more severe osteoporosis and directed the parathyroid hormone action more towards the kidneys and (by means of vitamin D) to the intestine (Hazenwinkel; 1990). However, hyperthyroidism eventually causes an augmented bone resorption which undermines the rigidity of the cancellous and cortical bone causing compression and greenstick fractures, respectively (Morris *et al.*, 1971). The present study is to document the histological bone abnormalities in dogs fed red meat only.

2. MATERIALS AND METHODS

Four littermate domestic house dogs 3.5 months of age were used two of them male and female were fed red meat only, the control male and female dogs were fed natural food. The experiment was terminated after six months. The animals were killed by intravenous overdose anesthesia, long bones were removed, fixed in 10% buffered formalin, then demineralized under water pump vacuum in 10% formic acid buffered pH4.5 with sodium citrate, embedded in paraffin, 4 micromere sections were obtained and stained with hematoxylin and eosin (H&E) (Saville *et al.*, 1967).

3. RESULTS

The histological picture of diaphysis in control animals showed that all lamella were thin and cortex consist of osteons with uniformly narrow Haversian canals. There are a few, small holes which are normal in the modeling process (Fig .1).