

HYPERTROPHIC OSTEOPATHY (MARIE'S SYNDROME) IN GERMAN SHEPHERD DOG

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Hypertrophic osteopathy is a diffuse proliferative condition involving the periosteum of long bones in dogs secondary to neoplastic or infectious masses in the thoracic or abdominal cavity. A nine-year-old German shepherd dog was presented to Dept. of Veterinary Surgery and Radiology, Veterinary College Hospital, Bengaluru with the complaint of anorexia, dullness, loss of body condition and swelling of forelimbs which was more prominent in left forelimb. On physical examination the left forelimb was warm to touch, no pain and non-oedematous swelling was noticed. Radiography of both the forelimbs revealed periosteal proliferation. The thoracic radiograph revealed radiodense lesions in the lung field suggesting metastatic tumours and the pet had undergone mammary tumour excision two months back. Based on these it was diagnosed as hypertrophic osteopathy secondary to metastatic pulmonary tumours.

Keywords: German shepherd dog, Hypertrophic osteopathy, Marie's syndrome, Periostosis.

Hypertrophic Osteopathy (HO) is a pathological condition characterized by progressive, bilateral and symmetrical periosteal bone hyperostosis. Hypertrophic osteopathy is considered a secondary disease that occurs as a consequence of many chronic processes, which are primarily localized in the thoracic cavity (intrathoracic lesions) and less as a result of changes in the abdominal cavity (extrathoracic lesions) (Janevski *et al.*, 2023).

Dogs are considered to have with greater predisposition to this disease (Craig *et al.*, 2016), normally seen in large or giant breeds of dogs. The aetiology of hypertrophic Osteopathy is diverse, the pathogenesis is not very well understood. But, one of the widely-accepted theory is that HO occurs due to a neurovascular reflex mechanism (Pachamé, *et al.*, 2017). Hypertrophic osteopathy is more common in females (Ezzeldeinet *al.*, 2022) than in males because mammary carcinomas may cause metastatic lung tumours and this may lead to hypertrophic osteopathy. This paper describes the case of hypertrophic osteopathy in a German shepherd dog.

Materials and Methods

A nine-year-old, female German shepherd dog was presented to the Department of Veterinary Surgery and Radiology, Veterinary College Hospital, Bengaluru with the complaint of anorexia, dullness, loss of body condition and swelling of forelimbs which was more prominent in left forelimb. The dog was subjected for thorough clinical examination including the animals' posture and movement of the dog and palpation of limb. Regular physical parameters like rectal temperature, respiratory rate and colour of the mucous membrane were also recorded. Radiography of the limbs in mediolateral and anteroposterior views and right lateral thoracic view were taken. The limb radiographs were inspected for any periosteal reactivity of the long bone and thoracic radiographs were inspected for lung lesions and intrathoracic radiopacity.

Results and Discussion

Based on history, clinical findings and radiography the dog was diagnosed with Hypertrophic osteopathy. On clinical examination of dog, the left forelimb was

typically warm to touch, no pain and non-oedematous swelling affecting the lower parts of the limbs (Fig. 1) and respiratory manifestations like abnormal lung sounds were observed.

Radiography of both the forelimbs revealed severe periosteal proliferation at the distal radius and ulna region and in metacarpal region in both the limbs (Fig. 2). The thoracic radiograph revealed several

large radiodense lesions in the lung field suggesting metastatic tumours (Fig. 3). Further, the owner informed that the pet had undergone mammary tumour excision two months back. The histopathology examination of the mammary tumour revealed atypical cells arranged in papillary pattern with fibrovascular core representing intraductal papillary neoplasm of mammary gland.



Fig. 1: DOG SHOWING NON-OEDEMATOUS SWELLING IN THE FORELIMB



Fig. 2: PERIOSTEAL REACTION IN THE FORELIMBS



Fig.3: THORACIC RADIOGRAPH SHOWING SEVERAL LARGE RADIO-DENSE LESIONS IN THE LUNG FIELD

Hypertrophic osteopathy was a rare pathologic condition and is secondary to neoplastic or infectious masses in the thoracic

cavity or less often, a mass in the abdominal cavity. Since it was secondary to neoplastic conditions, breed, age and sex of animal were

of less value. But was commonly seen in dogs of more than 8 years old and was frequently seen in female dogs. similar to the present case where a female dog which was aged about nine years was affected.

The pathogenesis of HO appears to be multifactorial as also recorded by Elhamiani Khatat *et al.*, 2020, suggested hypothesis - include increased levels of circulating toxins that were products of the primary lesion causing irritation to the periosteum and synovial membranes. Changes in the peripheral circulation, primarily in the distal parts of the extremities due to the indirect effects of the primary lesion, primary lung lesions fail to inactivate the growth factor that induces hyperostosis and last hypothesis was through the neurovascular mechanism as also mentioned by Janevski *et al.*, 2023.

The diagnosis of HO was made by history, physical examination, radiography of the affected bones to find the periosteal reaction and radiography of the thorax to explore the primary cause of HO. The radiograph of thorax revealed the presence of metastatic pulmonary tumours as consequence of mammary gland tumour in the dog which was operated a few months back. The treatment of choice was removal of the underlying disease. The prognosis of hypertrophic osteopathy depends on the primary cause and its elimination either with surgery or medical management. In the present case it was a case of pulmonary hypertrophic osteopathy and the prognosis was guarded. In general, if the primary factor responsible for HO was diagnosed at the initial stage and addressed earlier, the progression may slow down, spontaneously resulting in prolongation of the animal's life.

Conclusions

Hypertrophic osteopathy occurs as a consequence of number of primary conditions

like intra thoracic or intra-abdominal neoplasms. Early diagnosis using different imaging techniques may help in managing the condition to prolong the life of animal. The survival rate depends on severity and stage of the disease in affected animals. Further, more effective approaches for the prevention, early detection, and treatment might improve the prognosis in dogs.

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