

**OSTEOSARCOMA IN HINDLIMB OF A GERIATRIC DOG: A PATHOLOGICAL STUDY**MRIDUL SONI<sup>1</sup>, RAKESH KUMAR<sup>1\*</sup>, SAHIL CHOUDHARY<sup>1</sup>, RAHUL SINGH<sup>1</sup>, ANMOL BISHT<sup>1</sup>,  
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**SUMMARY**

A 14-years old German Shepherd male dog was presented with the history of large swollen tibial joint of left hind limb with not weight bearing on corresponding limb since from past 20-30 days. Radiological investigation revealed periosteal proliferative and lytic reaction. Cytological examination revealed the presence of multinucleated giant cells in association with several osteoblast cells showing pleomorphic changes with altered nuclear cytoplasmic ratio. Biopsy of the tissue collected from the amputated limb evidenced the presence of increased osteoclastic activity along with the replacement of osseous tissue by fibrous connective tissue. The presence of tumour giant cells with predominant osteoid tissue production was also reported at several places. Histopathological findings confirmed the case to be osteosarcoma.

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Osteosarcoma is a primary malignant tumour of mesenchymal origin contributing approximately 80% of total bone neoplasms. These tumours are profoundly aggressive and often show metastases to various organs due to their invasive nature (Pool, 1990). The weight bearing bones (humerus, radius, ulna, femur, tibia etc.) of large and giant breeds of dogs are more often affected by osteosarcoma (Liu *et al.*, 1977; Spodnick *et al.*, 1992).

The present study involved a case of intact German Shepherd dog with the history non-bearing of weight on left hind limb for past 20-30 days and oozing of serosanguineous fluid from the site presented to the Veterinary Clinical Complex (VCC), DGCN COVAS, CSKHPKV, Palampur. Radiological examination of the affected limb was done and an impression smear prepared from the affected part to identify the preliminary basis of the pathological condition. The cytological examination of the impression smear collected from the mass located in the left hind limb stained with Giemsa stain. The limb of the animal was amputated (Fig. 1) and 0.5 cm thick representative tissue section was collected in 10% neutral buffered formalin (NBF) for histopathological examination.

The radiographic findings showed destruction of cortex at distal aspect of tibia and fibula with evident periosteal reaction. The cytological smear examination exhibited pleomorphism, hyperchromasia and altered nuclear cytoplasmic ratio in osteoblast cells along with the presence of multinucleated giant cells (Fig. 2). Microscopic evaluation of the tissue sections submitted for biopsy examination revealed abnormal pleomorphic and hyperchromatic osteoblasts, elevated osteoclastic activity,

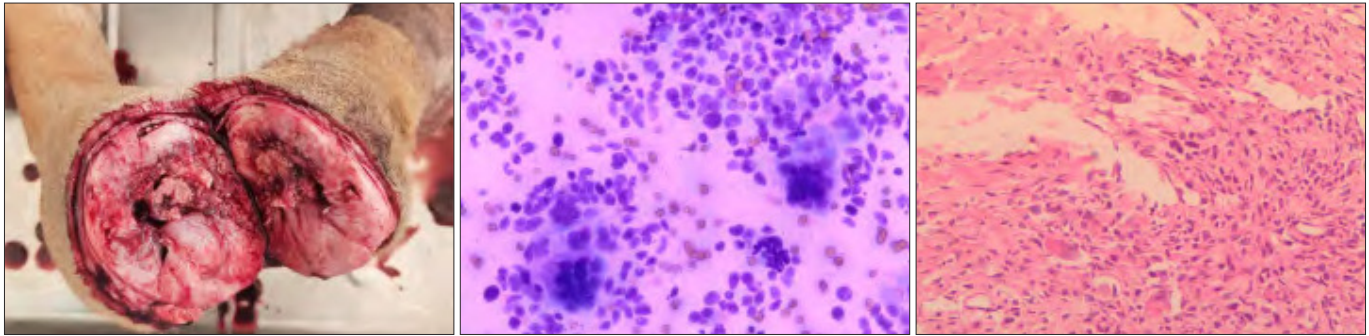
irregular trabeculae with eosinophilic osteoid and presence of multinucleated tumour giant cells (Fig. 3). Special staining of tissue sections with Masson's trichrome stain revealed a marked proliferation of bluish coloured fibrous collagenous tissue replacing the osseous tissue (Fig. 4). The neoplastic proliferation of cells is speculated to be originated from periosteum of the bone.

Osteosarcomas are most commonly reported and diagnosed tumours in canines and young human beings (Morello *et al.*, 2011). The occurrence of these tumours is majorly influenced by several factors including age, anatomical position, breed etc. of the dogs. This tumour is difficult to differentiate clinically from some similar tumours like giant cell tumours (Bertoni *et al.*, 2003). The histological examination showing osteoid matrix production in association with anaplastic changes help to differentiate osteosarcoma from giant cell tumour (Fain *et al.*, 1993). Based upon the clinical signs, radiographic examination, cytological analysis and biopsy evaluation the present dog is confirmed to be affected with osteosarcoma of periosteal origin.

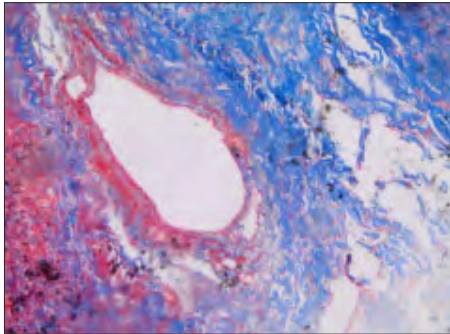
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Figs. 1-4. (1) Amputated left hind limb showing resorption of bone with marked peri-osteal reaction, (2) Giemsa stained cytosmear showing pleomorphic osteoblast cells with eccentric nuclei along with multinucleated giant cells. Giemsa stain  $\times 200$ , (3) Pleomorphic changes in osteoblast cells and increased osteoclastic activity along with proliferation of fibrous tissue. H&E  $\times 200$ , (4) Masson trichrome stained tissue sections showing fibrous tissue proliferation indicated by blue colour. MST  $\times 400$



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