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Histopathological diagnosis of a rare case of metastatic extraskelatal osteosarcoma in a dog: A case report

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Abstract

Extraskelatal osteosarcoma, is a rare malignant mesenchymal soft tissue tumor unattached to skeletal framework and comprises of malignant cells of osteoblastic phenotype that produce osteoid. It often spreads to other parts of the body, including the lungs. It usually occurs in the thigh, shoulder or trunk region. A 11-year-old neutered male Great Dane was presented to Teaching Veterinary Clinical Complex of Veterinary College, Bengaluru with a history of selective feeding, inspiratory dyspnea, halitosis, dysphagia, hyporexia, ptyalism and progressive weight loss. A complete examination of oral cavity revealed multiple blackish-brown large masses on base of the tongue. The general clinical examination revealed increased capillary refill time, and mild pyrexia. The hematobiochemical values revealed neutrophilic leucocytosis, anaemic changes, elevated creatinine & ALP values. Radiography revealed no skeletal involvement of the mass. Surgical resection followed by histopathological analysis aided in further diagnosis. The multifocal formation of sclerotin and osteoid was well appreciable in the histopathology. The case was diagnosed as metastatic extraskelatal osteosarcoma.

Keywords: Extraskelatal osteosarcoma, Great Dane, dog

1. Introduction

Osteosarcoma is a malignant cancer of the bone. Osteosarcomas appear to affect large breed dogs more commonly than the small breeds. Reported predisposed breeds include Boxer Dogs, Doberman Pinschers, Golden Retrievers, German Shepherd Dogs, Great Danes, Greyhounds, Irish Setters, Irish Wolfhounds, and Rottweilers. Extraskelatal osteosarcoma (EOS) is a rare mesenchymal neoplasm characterised by the formation of osteoid, arising from viscera or soft tissues in the absence of involvement of bone or periosteal tissues. Extraskelatal osteosarcoma principally affects older dogs, has no apparent breed predilection, and may develop more frequently in males (Schna *et al.* 1989) [6]. Extraskelatal osteosarcomas have been reported to make up approximately 1% of all canine osteosarcomas. Extraskelatal osteosarcoma (EOS) is a rare, malignant, osteoid-producing, mesenchymal neoplasm without primary periosteal or bone involvement. The common sites for ESOA were found to be in adrenal gland, spleen, eye, testicle, vagina, kidney, intestine, spleen, mesentery and liver (Patnaik 1990) [4]. Previous studies have showed EOS to be highly malignant with distant metastatic spread found in up to 64% of cases at the time of necropsy, and reported median survival times (ST) ranging from 26 (for soft tissues and viscera) to 90 days (for mammary gland only). Extraskelatal osteosarcomas are malignant tumors with distant metastases occurring in 64% of cases (Kuntz *et al.* 1998) [3].

Case history & Observations

A 11-year-old neutered male great Dane was presented to Veterinary College Hospital, Bengaluru with a history of progressive hyporexia, cachexia, dysphagia, halitosis, serosanguineous oral discharge. Upon detailed clinical examination of the oral cavity, multiple nodular irregular cauliflower-like ulcerated blackish-brown mass attached to base of oral cavity & root of tongue was observed. On radiography of the right lateral thorax, multiple nodules were observed in the pulmonary parenchyma (Fig 1.1) which suggestive of malignancy.

Table 1: Hematology- complete blood count (Pre-surgical & Post-Surgical)

Parameters	Presurgical	Postsurgical
TLC	15.26 x 10 ³ /microlitre	14.30x10 ³ /microlitre
HGB	10.21 g/dL	9.89 g/dL
RBC	5.26 x 10 ⁶ /microlitre	4.12 x 10 ⁶ /microlitre
HCT	36.83%	28.86%
PLT	419 x 10 ³ /microlitre	172 x 10 ³ /microlitre
Reticulocytes	1.5%	1.1%

Table 2: Serum biochemistry (Pre-surgical & Post-Surgical)

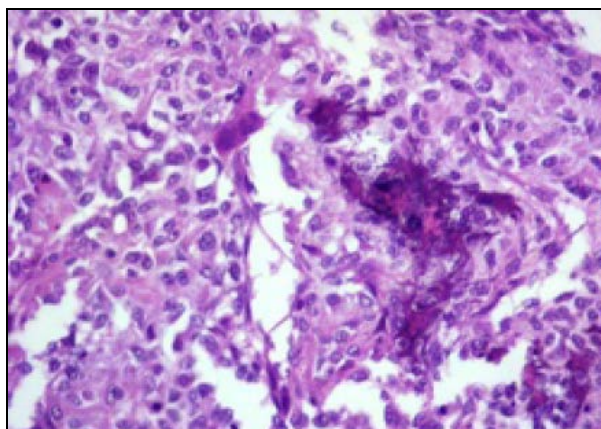
Parameters	Presurgical	Postsurgical
Creatinine	2.8 mg/dL	3.2 mg/dL
BUN	26.32 mg/dL	38.26 mg/dL
ALT	39.00 IU/L	68.6 IU/L
ALP	399.06 IU/L	438.6 IU/L
Calcium	9.2. mg/dL	10.2 mg/dL
Phosphorus	5.62 mg/dL	4.6 mg/dL
AST	26.00 IU/L	24.22 IU/L
Blood glucose	128 mg/dL	118 mg/dL

Diagnosis & Treatment

Cytopathological evaluation of the fine needle aspiration smear from the oral mass showed moderate cellularity. The cells were distributed mostly in clusters and occasionally as individual cells, in a background of homogeneous eosinophilic intercellular material consistent with osteoid matrix. The cells were mainly osteoblasts and osteoclasts, with occasional large multinucleated giant cells and fibroblasts. The osteoblasts exhibited marked anisocytosis and

anisokaryosis, with coarse chromatin, prominent nucleoli, and an increased nuclear-to-cytoplasmic ratio.

Histopathological examination of the resected mass revealed sheets of oval to spindle-shaped anaplastic osteoblasts, mixed with varying amounts of osteoid and cartilaginous matrix. Occasional multinucleated giant cells were observed. There were multifocal areas of trabecular formation and desmoplasia. Mitotic figures were present at a rate of more than 7 per high-power field. The condition was diagnosed as osteoblastic type of Extraskeletal Osteosarcoma (Fig 1.2).

**Fig 1.1:** Metastasis into lungs**Fig 1.2:** Osteoid formation

The oral mass was surgically resected under general anaesthesia. Animal was premedicated with Meloxicam (Melonex, Intas, India) @0.2 mg/Kg SC & Tramadol (Supridol, Neon, India) @4 mg/kg IM, Pantoprazole (Pantop-40, Aristo, India) @ 1 mg/kg, and Amoxicillin Sulbactam (Amoxirum-Forte, Virbac, India) @ 20 mg/kg intravenously. 15 minutes later sedation was achieved with a combination of Xylazine (Xylaxin, IIL, India) (1.5 mg/kg) and Ketamine (Anekot, Neon, India (@5mg/kg) intramuscularly. The base of the tumour mass was ligated with Catgut No.2. And the mass was resected. Post operatively pet was treated for IRIS Stage 2 CKD. The aim of the treatment protocol was to discontinue nephrotoxic drugs, treat renal abnormalities, correction of acidosis, initiation of renal diet, correction of dehydration, dietary phosphate reduction. After two days of fluid therapy the pet was put on Sodium Bicarbonate @ 10 mg/kg BID P.O., Benazepril @ 0.5mg/kg BID P.O., Gelusil (phosphate binder) syrup along with haematinics and

multivitamin supplements. Showed gradual improvement in condition for one week but unfortunately the pet died 21 days after surgical intervention.

According to TNM staging of tumor mass according to Owen 1980: T3a (m) -N1b -M1.

Discussions

Extraskeletal osteosarcoma, also called as extraosseous osteosarcoma, is a rare malignant mesenchymal soft tissue tumor unattached to skeletal framework and comprises of malignant cells of osteoblastic phenotype that produce osteoid. Extraskeletal osteosarcomas (EOSs) are rare tumors that arise in various soft-tissue sites (e.g., gastrointestinal tract, subcutaneous tissue, spleen, liver, skin, kidney, urinary bladder, muscle, thyroid gland, eye, and mammary glands). In contrast to human beings, in which most extraskeletal osteosarcomas occur in the soft tissues and the extremities, most canine extraskeletal osteosarcomas develop in the

visceral organs (Patnaik 1990) [4]. The cause of ESOS is unknown, but may involve malignant metaplasia of pluripotential mesenchymal cells into osteoblasts. Macroscopically, ESOS usually is observed as a hard mass and may appear similar to calcified hematoma or myositis ossificans. The classic radiographic appearance of ESOS is a soft tissue mass with focal mineralization and without adjacent bone involvement. (Schena *et al.* 1989) [6]. The mean age of the dogs with extraskelatal osteosarcoma reported here was 11 years (Patnaik 1990) [4]. EOSA is a rare osteosarcoma that occurs outside the bone tissue, accounting for only 1% of all soft tissue sarcomas and 4% of all osteosarcomas. EOSA may be classed as osteoblastic, chondroblastic, fibroblastic, malignant fibrous histiocytoma-like, telangiectatic and well-differentiated. The prognosis for EOSA appears to be worse than that for Skeletal OSA (Kuntz *et al.* 1998) [3]. Survival times with surgery have ranged from one to 175 days, with one case surviving 43 months (Kipnis *et al.* 1992) [2].

Conclusion

This is a very rare case of extraskelatal osteosarcoma in the oral cavity and according to author's knowledge, this is the 2nd case of EOSA reported in oral cavity of dogs.

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Conflict of Interest

Not available

Financial Support

Not available

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