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Avantika Srivastav
Ph.D. Scholar, Division of Pathology, ICAR-IVRI, Division of Pathology, Bareilly, Uttar Pradesh, India

Ankit Jaiswal
Ph.D. Scholar, Department of Livestock Production Management ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Shyama N Prabhu
Assistant Professor, Department of Veterinary Pathology College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar Pradesh, India

Kavisha Gangwar
Assistant Professor, Department of Veterinary Pathology College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar Pradesh, India

Renu Singh
Assistant Professor, Department of Veterinary Pathology College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar Pradesh, India

Neeraj Kumar Gangwar
Associate Professor, Department of Veterinary Pathology College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar Pradesh, India

Corresponding Author:
Ankit Jaiswal
Ph.D. Scholar, Department of Livestock Production Management ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India

Maxillary osteosarcoma in a rottweiler dog: A case report

Avantika Srivastav, Ankit Jaiswal, Shyama N Prabhu, Kavisha Gangwar, Renu Singh and Neeraj Kumar Gangwar

Abstract
Osteosarcoma (OSA) stands as the most frequently diagnosed primary bone cancer in dogs. Maxillary osteosarcomas are rare in dogs. This case report presents the clinical findings and diagnostic approach in a five-years-old male Rottweiler that was presented in the Veterinary Clinical Complex (VCC), DUVASU, and Mathura. Physical examination revealed severe facial swelling in both sides of maxillary region, accompanied by reddish pink color mucous membrane. Radiographic images depicted extensive lysis of the maxillary bones, exhibiting a characteristic moth-eaten appearance. Cytopathological examination of the neoplastic mass demonstrated numerous moderately pleomorphic cells embedded in abundant osteoid and several multinucleated cells. This case underscores the importance of cytology in the diagnosis of Osteosarcoma in dogs.

Keywords: Osteosarcoma, rottweiler, maxillary region**,** cytology

Introduction
Osteosarcoma stands as the predominant primary bone tumor among canines, constituting approximately 85% of malignant bone neoplasms, as reported by Kleiner and Silva in 2003 [5]. According to Heyman *et al*. (1992) [4], around a quarter of osteosarcoma cases impact the skull and axial skeleton regions. They primarily originate from the appendicular skeleton, whereas axial osteosarcomas, affecting flat bones, are less commonly observed, especially among large breeds (Nejad *et al*., 2019) [7]. Osteosarcoma, comprising 2–5% of canine malignancies, stands as the most prevalent bone tumor in dogs (Hammer *et al*., 1995) [3]. In contrast, osteosarcoma of the maxilla is relatively rare among canine cases, accounting for only 12% to 13% of reported instances compared to other locations (Heyman *et al*., 1992) [4]. Recognized for its swift growth, invasive nature, and propensity for metastasis, this osteogenic sarcoma disrupts bone formation or mesenchymal tissue, leading to the formation of osteoid matrix, a defining characteristic distinguished by Bane *et al*. in 1990 [1].
The mean age at diagnosis of canine oral and maxillofacial osteosarcoma is 9–10 years (Schwarz *et al*., 1992) [8]. According to the literature, large breeds like Rottweilers, Irish Setters and Labrador Retrievers show great predisposition for OSA (Osteosarcoma) (Vanel *et al*., 2013) [12]. There is no clear pattern of distribution regarding sex predisposition in oral and maxillofacial osteosarcoma in dogs (Straw *et al*., 1996). For the diagnosis of osteosarcoma, incisional biopsy followed by histopathological examination is the standard for diagnosing primary bone lesions, but it has drawbacks like complications and patient discomfort (Teixeira *et al*., 2010) [10]. Fine needle aspiration (FNA) cytology is a less invasive alternative with fewer complications and quicker results. This case report highlights the diagnostic importance of cytology in identifying maxillary osteosarcoma in a Rottweiler dog, particularly in uncommon locations like the maxillary region. This underscores the significance of considering less invasive techniques such as fine needle aspiration cytology in the diagnostic approach for canine osteosarcoma.

Material and methods
The present case was analysed at the Department of Veterinary Pathology (DUVASU), Mathura, Uttar Pradesh, India.

FNAC was conducted in the tumorous mass as per Cowell *et al*. (2007) [13] with the help of a fine needle (22G). The slides were first fixed with the methanol and then stained by Giemsa (Thangathurai *et al*., 2008) [14]. Smears were analyzed under optical microscope under oil immersion.

Results and Discussion

Grossly, painful facial swelling was clearly observed in both sides of maxillary region, accompanied by reddish pink color mucous membrane, this was in accordance with the findings of Patnaik *et al*., 1984 [15]. Radiographic images depicted extensive lysis of the maxillary bones, exhibiting a characteristic moth-eaten appearance that was similar to the earlier findings. (Thompson and Dittmer, 2020) [11].

Fig 1: Rottweiler showing the extensive swelling of the maxillary region

Fig 2: Rottweiler showing oral manifestation of the tumorous mass in the maxillary region (Arrow)

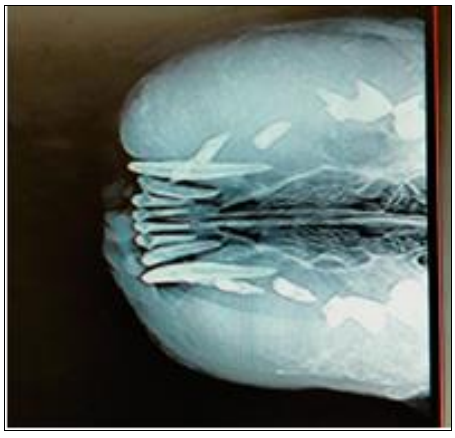

Fig 3: Radiographic images showing tumours growth

The cytological analysis confirmed the presence of a neoplastic mass characterized by numerous pleomorphic cells surrounded by abundant osteoid and several multinucleated cells, consistent with earlier findings (Gomes and Rocha, 2016) [2].

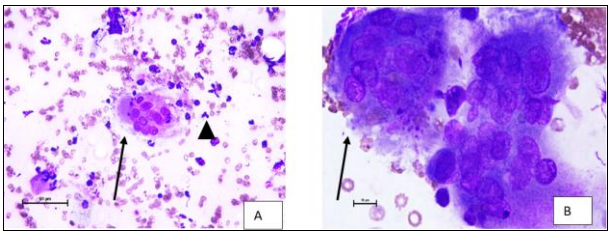

Fig 4: A. The Cytological smear of osteosarcoma showing tumorous cells with round to oval morphology (Arrow) having scarce cytoplasm and multinucleated cells with coarse chromatin material. The presence of neutrophils is also seen (Arrowhead) 400X, B. Giemsa stain, 1000X

Conclusion

This case underscores about maxillary osteosarcoma in a five-year-old male Rottweiler, emphasizing the utility of minimally invasive diagnostic methods like fine needle aspiration cytology. The clinical presentation, radiographic imaging, and cytological examination align with existing literature on canine osteosarcoma, affirming the diagnosis. Furthermore, the absence of metastasis on thoracic radiographs and abdominal ultrasound emphasizes the localized nature of the disease in this instance. The successful identification of this case demonstrate the value of cytology in detecting bone neoplasms, especially in atypical sites, thus facilitating more efficient and less invasive diagnostic protocols for canine osteosarcoma.

Acknowledgement

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Conflict of interest

Authors have no conflict of interest in this study.

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