



CASE REPORT

Osseous Metaplasia in the Lateral Abdominal Region of a dog

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ARTICLE HISTORY (13-479)

Received: October 19, 2013
Revised: February 02, 2014
Accepted: April 9, 2014

Key words:

Dog
Histopathology
Osseous metaplasia
Subcutaneous tumor

ABSTRACT

A 1.5-year-old, intact male French bulldog was presented for evaluation of an abnormal mass deformation on the right flank (lateral abdominal). The dog was healthy and had no other abnormalities. The clinical diagnosis of the tumor was uncertain and a surgical resection of the mass was performed after a preliminary evaluation by needle biopsy. Histopathology showed the presence of bone formation in an abnormal location. The diagnosis was primary osseous metaplasia. No signs of neoplasia were observed. Thirteen months after surgery, the canine had a good health status without further tumor or metastatic symptoms. Osseous metaplasia may be an additional differential diagnosis for abnormal masses in the subcutaneous tissue of the lateral abdominal region of dogs.

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To Cite This Article: Damián JP, J Pacheco, MJ Sabalsagaray and K Rando, 2015. Osseous metaplasia in the lateral abdominal region of a dog. *Pak Vet J*, 35(1): 114-115.

INTRODUCTION

The most common type of tumors in domestic dogs are cutaneous tumors, corresponding to 30% of tumors; mast cell tumors (MCT) and soft tissue sarcomas (STS) are the most common presentations (Monteiro *et al.*, 2011). Prognosis and behavior of cutaneous MCT vary from nearly benign to highly invasive malignant neoplasms and are typically solitary lesions (O'Keefe, 1990). Lipomas are benign tumors, usually presented as solitary masses of fat cells that occur in approximately 16% of dogs (mostly in adult female or elderly obese dogs) (Lamagna *et al.*, 2012). Lipomas are usually localized in the subcutaneous tissues and are clinically non-infiltrative, well delimited, soft, and compressible masses. Some subcutaneous tumors of the skin and adnexa in dogs are mammary tumors from epithelial and myoepithelial cells; others are cartilaginous, carcinomas and carcinosarcomas (Goldschmidt *et al.*, 2011). Osseous metaplasia is rare in animals and can be found associated to the external auditory canal, mammary tumors, or salivary mucocele (Park *et al.*, 2010; Fernandes *et al.*, 2012). Non-subcutaneous osseous metaplasia has been reported in other localization in a canine.

Case history, clinical examination and diagnosis: A 1.5-year-old, intact male French Bulldog was presented for evaluation of an abnormal mass deformation on the

right flank of the abdominal lateral wall. The deformation presented as a simple, movable, non-infiltrative, firm, painless, and well-circumscribed mass of around 5 cm in diameter and located in the subcutaneous tissue. The dog was healthy and had no other body abnormalities. Biochemistry and hematological parameters were within normal limits.

A biopsy puncture was performed as a primary diagnosis technique, but only blood cells and adipocytes were observed. The primary diagnosis (MCT or STS) was based in the clinical characteristics of the dog (middle age, non-fatty male) as well as the firm consistency of the isolated mass. The differential diagnosis included lipoma, fibrolipoma, or chondroid lipoma. Complete surgical removal is the recommended local treatment for MCT and STS (Monteiro *et al.*, 2011). No fine needle aspiration cytology, CT or MRI was performed to confirm the diagnosis, so the surgical treatment was considered the safest.

The mass was completely removed under general anesthesia. The excised mass was fixed in 10% neutral-buffered formalin and submitted to the Veterinary Pathology Service of the Veterinary Faculty for histopathological examination. The formalin-fixed tissue was processed routinely and embedded in paraffin wax and sections (5 µm) were stained with hematoxylin and eosin.

In the postoperative period, the dog had a good outcome without surgical or anesthetic complications.

Thirteen months after surgery, the dog had a good health status without further local tumor and without recurrence or metastatic symptoms.

Histopathology: Histopathology showed the presence of bone formation, identified by the formation of lamellae and trabeculae osteoid with ground substance, including osteoclasts (Figs. 1 and 2). The surrounding area showed adipose tissue and neo-vessel formation with a high mitotic activity in cells (Fig. 1). In certain areas of the slide, the onset of a hemopoietic tissue (possibly bone marrow) was present with myeloid cells, erythrocytes and lymphoid cells (Fig. 2). No signs of neoplasia and minimal inflammation were observed within the sections.

DISCUSSION

In general, the term osseous metaplasia refers to “bone formation in abnormal locations” (Lynch and Scagliotti, 2007), which involves a differentiation of

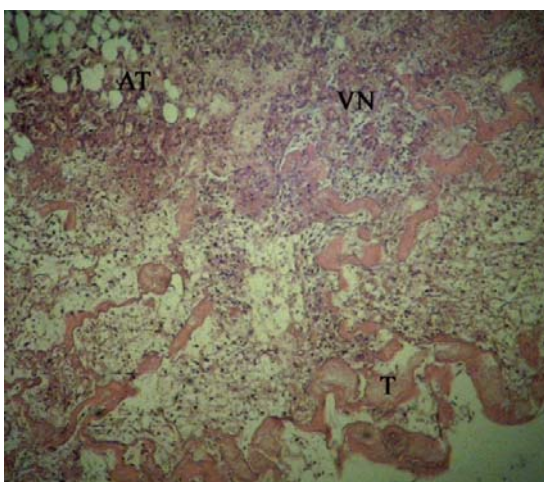


Fig. 1: Histopathology (H & E; 100x) of a mass localized in lateral abdominal region; intact male French Bulldog 1,5- year-old. Is identified in the figure the presence of lamellar and trabecular osteoid (T), neo-vessel formation (VN), adipose tissue (AT), showing no evidence of neoplasia and minimal inflammation.



Fig. 2: Histopathology (H & E; 400x) of a mass localized in lateral abdominal region; intact male French Bulldog 1,5- year-old. Is identified in the figure the presence of lamellar and trabecular osteoid (T), myeloid cells (M), erythrocytes (E) and osteoclasts (Os).

fibroblast-like cells into osteoblasts and osteoid formation. Abnormal locations of bone formation in dogs include mammary tumors (Goldschmidt *et al.*, 2011), cutaneous lipomas (Ramirez *et al.*, 2010), salivary mucocele (Park *et al.*, 2009), eyes (Lynch and Scagliotti, 2007), skin (Doerr *et al.*, 2013) and the external auditory canal (Park *et al.*, 2010). However, to our knowledge, this is the first report of osseous metaplasia located in the subcutaneous tissue of lateral abdominal region in a domestic dog.

In the present case, there was no evidence of lipoma or other neoplastic changes in the tissue. Although, the origin may be from adipose tissue, traumatic or metabolic insult, or even from mesenchymal stem cells, there was no evidence of the possible source for this pathological mass. Based on the information above (no evidence of other etiology) and given that the dog was healthy (without recurrence) and did not present any pathological signs even after one year, we speculate that this was a case of primary osseous metaplasia located in the lateral abdominal region.

Osseous metaplasia was evidenced in our patient due to the presence of trabecular osteoid with ground substance and osteoclasts, neo-vessel formation, and the presence of hematopoietic tissue. No signs of a neoplasm or any other possible etiology were identified. Osseous metaplasia may be an additional differential diagnosis for skin tumors or other non-neoplastic masses in the subcutaneous and cutaneous lateral abdominal region of dogs.

Acknowledgement: We thank Mr. Gordon Gonzalez Rando for providing the information to write this paper and Dr. Helena Katz (Pathology Area, Veterinary Faculty) for constructive reading of the early draft.

REFERENCES

- Doerr KA, CA Outerbridge, SD White, PH Kass, R Shiraki, AT Lam and VK Affolter, 2013. Calcinosis cutis in dogs: histopathological and clinical analysis of 46 cases. *Vet Dermatol*, 24: 355-361.
- Fernandes TR, F Grandi, LN Monteiro, BS Salgado, RM Rocha and NS Rocha, 2012. Ectopic ossification presenting as osteoid metaplasia in a salivary mucocele in a Shih Tzu dog. *BMC Vet Res*, 8: 13.
- Goldschmidt M, L Peña, R Rasotto and V Zappulli, 2011. Classification and grading of canine mammary tumors. *Vet Pathol*, 48: 117-131.
- Lamagna B, A Greco, A Guardascione, L Navas, M Ragozzino, O Paciello, A Brunetti and L Meomartino, 2012. Canine lipomas treated with steroid injections: clinical findings. *PloS one*, 7: e50234.
- Lynch GL and RH Scagliotti, 2007. Osseous metaplasia in the eye of a dog. *Vet Pathol*, 44: 222-224.
- Monteiro B, S Boston and G Monteith, 2011. Factors influencing complete tumor excision of mast cell tumors and soft tissue sarcomas: a retrospective study in 100 dogs. *Can Vet J*, 52: 1209-1214.
- O'Keefe DA, 1990. Canine mast cell tumors. *Vet Clin North Am Small Anim Pract*, 20: 1105-1115.
- Park JK, JY Han, IH Hong, OK Hwang, KS Hong, AR Ji, MR Ki, SI Park, TH Kim, DH Cho and KS Jeong, 2009. Salivary mucocele with osseous metaplasia in a dog. *J Vet Med Sci*, 71: 975-977.
- Park JK, SK Lee, SJ Park, IH Hong and KS Jeong, 2010. Fibroma with osseous metaplasia of external auditory canal in a dog. *J Vet Diagn Invest*, 22: 635-638.
- Ramirez GA, J Altimira, B Garcia and M Vilafranca, 2010. Chondro-osteoblastic metaplasia in canine benign cutaneous lipomas. *J Comp Pathol*, 142: 89-93.