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Cutaneous Xanthoma in a Domestic Pigeon: Pathologic Study (Case Report)

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Abstract: Xanthomas are nodular inflammatory lesions that imitate neoplasm with lipomatous origin. These lesions can be solitary or multiple and appear as papillary nodules to raised plaques. Every tissues or internal organs of humans and animals may be affected by xanthomas. The present study, described a case of cutaneous xanthoma in a 4 year old pigeon. Grossly, a yellow nodule, firm in texture, well-demarcated with a semi-pedunculated base was present on the right wing. The overlying epithelium had multifocal ulceration and was not covered with the feathers. Histopathological examination revealed infiltration of numerous, large, foamy macrophages with an eccentric nucleus as well as varying degrees of lymphocytes, eosinophils and multinucleated giant cells in the superficial and deep dermis. A large number of extracellular needle-like cholesterol clefts were present in the lesion. In some area, mild to moderate acanthosis and hyperkeratosis was observed. Multifocal necrosis and ulcerations were obviously visible at the superficial epidermis. On the basis of the histopathological findings, diagnosis of cutaneous xanthoma was made in this case.

Key words: Xanthoma · Pigeon · Pathology

INTRODUCTION

Xanthomas are rare, benign, nodular granulomatous lesions that occur in the skin, subcutaneous tissues, tendons and internal organs of humans [1, 2] and various animals species such as reptiles [3, 4], cats [5], dogs [6, 7], horses [8] and birds [9]. Xanthomas are non neoplastic masses characterize by accumulation of lipoprotein-laden macrophages. Hyperlipidemias are considerate as a likely etiological factor. They may or may not be related to hyperlipidemias and can be categorized as xanthelasma, eruptive xanthomas, tendon xanthomas, plane xanthomas, xanthoma disseminatum and verruciform xanthomas [10]. Xanthomas are characteristically pale yellow-to-white color in both humans and animals, due to their lipid content [11, 12]. In birds, xanthomas occur commonly in cockatiels and budgerigars and frequently in psittacine and gallinaceous birds. It appears usually on the wings and sternum as yellow mass with variable sizes [13]. The present case describes the clinical, macroscopic and histopathological findings of the cutaneous xanthoma in a 4-year old domestic pigeon.

Case Report: A 4-year old female pigeon with a painless, solid nodular mass (2×2 cm^2) on right, lateral side of the ulna and radius was referred to the Department of Clinical Sciences, Veterinary School, Shahid Bahonar University of Kerman. The nodule was yellow, firm in texture, well-demarcated with a semi-pedunculated base. The overlying epithelium had multifocal ulceration and was not covered with the feathers (Fig. 1). The owner declared that the mass was caused flying problem in the bird. Because of good body condition of the bird, radical resection of the mass was recommended.

The bird was anesthetized under halothane-oxygen administered via a head chamber. The fluffs and feathers of the affected area were removed and the region was surgically prepared. The mass was excised by an

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Fig. 1: Xanthoma in a pigeon. A yellow, semi-pedunculated nodule with multiple fine ulcerations on its surface is visible in the featherless part of the wing

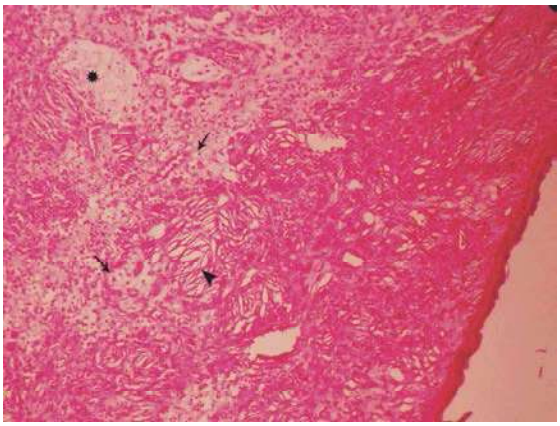

Fig. 2: Histopathologic section of xanthoma reveals numerous, large, foamy macrophages with an eccentric nucleus (arrows), lake of free lipid aggregation (asterisk) and extracellular needle-like cholesterol clefts (arrowhead) (H-&E, × 100)

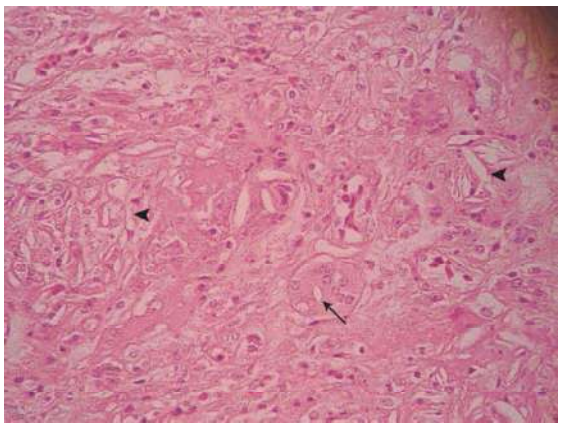

Fig. 3: A large number of extracellular cholesterol clefts (arrowheads) that some of them are visible as intracellular in giant cells cytoplasm (arrow) (H-&E, × 400)

electro-surgical unit. Oral consumption of oxytetracycline in drinking water has been recommended for one week as a postoperative medication. The bird was discharged on day 14, when the wound was acceptably diminished in size.

For histopathological evaluation, the removed nodule by surgical excision was fixed in 10% buffered formalin. Embedded paraffin tissues were processed by using standard procedures. Sections in 5-µm thickness were stained with hematoxylin-eosin and examined microscopically. Histopathological examination revealed sever infiltration of numerous, large, foamy macrophages (containing clear vacuoles in cytoplasm) with an eccentric nucleus as well as varying degrees of lymphocytes, eosinophils and multinucleated giant cells in the superficial and deep dermis. Free lipid-droplets in variable sizes were observed in lymphocytes and plasma cells. A large number of extracellular acicular cholesterol clefts were present in the lesion and some of them were visible in the cytoplasm of giant cells (Fig. 2 and 3). In some area, mild to moderate acanthosis and hyperkeratosis was observed. Multifocal necrosis and ulceration was observed at the superficial epidermis. The heterophils were infiltrated more near the ulcerated areas. The hemorrhage and necrosis were of the observed findings. On the basis of the histopathologic findings, diagnosis of cutaneous xanthoma was made.

DISCUSSION

Xanthomas are nodular inflammatory lesions that imitate neoplasms with lipomatous origin. These lesions can be solitary or multiple and appear as papillary nodules to raised plaques. Every tissues or organs such as subcutaneous, tendons, digestive system, kidney and conjunctiva in humans and animals may be affected by xanthoma [11, 12]. These lesions are not neoplastic but can invade locally. Xanthomas characterize by accumulation of lipid-laden macrophages, multinucleated giant cells and cholesterol clefts [14-16].

The pathogenesis of xanthomas is not clearly understood. Disorders in lipid metabolism are presumed in the formation of xanthomas. Serum cholesterol or other lipids are often evaluated in affected cases [17, 18]. In human, xanthomas are usually diagnosed as familiarly and in response to secondary hyperlipidemia in patients associated with diabetes mellitus, hypothyroidism, multiple myeloma, or cholestatic liver disease [19-21]. In animals affected to xanthomas different types of lipid components is frequently measured. Abnoemalities in

lipid metabolism and metabolic diseases including hyperlipidemia, diabetes mellitus, hypothyroidism, or hyperadrenocorticism are found in different animal species [8, 22-24]. In experimental studies, xanthomatosis was induced in Japanese quail by a diet containing cholesterol [25].

The present study, described a case of cutaneous xanthoma in a 4 year old pigeon. Xanthomas were reported in numerous avian species and various sites especially in psittacine birds [26, 27] but it occur rarely in the domestic pigeon. In this case, a firm, yellow color and semi-pedunculated on the wing that composed of lipid-filled macrophages, multinucleated giant cells, cholesterol cleft as well as fewer infiltration of lymphocytes, plasma cells and eosinophils in the stroma. Some gross and histopathological aspects of the cutaneous xanthomas in this case were similar to those reported in humans and different animal species. In contrast to our case that xanthoma was as a single nodule with smooth surface, in most reports, xanthomas appeared grossly multicentric and papillary form.

In previous studies, similar to present case, xanthomas were typically nodules of granulomatous inflammation comprising of xanthoma cells (foamy macrophages), cholesterol clefts and giant cells which sometimes were associated with fewer numbers of lymphocytes, eosinophils, neutrophils, mast cells and plasma cells [5, 6, 28].

Jaensch *et al.* [28] reported cutaneous xanthomas in a goose. Grossly, the multiple, papillary form masses were located on the feet-webbing, per ocular skin and submandibular space. In histopathological study, foamy cells containing intracytoplamic vacuoles that stained with oil-red O were observed. Also, lymphocytes and heterophils were infiltrated in the lesions.

Vogelnest [5] described cutaneous xanthomas in a 9 month old cat that appeared as multifocal papules and plaques on the head and neck. Microscopic evaluation was shown infiltration vacuolated macrophages, eosinophils and neutrophils. Cholesterol clefts, giant cells and free lipids were absent.

In birds, neoplasm's related to fatty tissue and lipid deposition include lipoma, myelolipoma, liposarcoma and hibernoma. Xanthomas and lipogranulomas may be confused with these tumors. Histopathological examination is a best way for definitive diagnosis of these neoplasm's or tumor like masse. Further research is required to clarify the xanthomas pathogenesis and its relation with hyperlipidemia, detection of original cells contributed in the lesion and their markers by immunohistochemistry.

REFERENCES

1. Herrera-Goepfert, R., M. Lizano-Soberon and M. Garcia-Perales, 2003. Verruciform xanthoma of the esophagus. Human Pathol., 34: 814-815.
2. Philipsen, H.P., P.A. Reichart, T. Takata and I. Ogawa, 2003. Verruciform xanthoma-biological profile of 282 oral lesions based on a literature survey with nine new cases from Japan. Oral Oncol., 39: 325-336.
3. Ryan, M.J. and G.D. Whitney, 1980. Xanthoma in a gopher snake. Vet. Med. Small. Anim. Clin., 3: 503-507.
4. Garner, M.M., N.P. Lung and S. Murray, 1999. Xanthomatosis in geckos: five cases. J. Zoo. Wildl. Med., 30: 443-447.
5. Vogelnest, L.J., 2001. Cutaneous xanthomas with concurrent demodicosis and dermatophytosis in a cat. Aust. Vet. J., 79(7): 470-475.
6. Romanucci, M., D. Malatesta, P. Guardiani, P. Frescura and L. Della Salda, 2008. Xanthogranulomatous inflammation of the small bowel in a dog. Vet. Pathol., 45: 207-211.
7. Balme, E., C. Thuilliez, T. Lejeune, L. Chateau-Escoffier and F. Bernex, 2009. Multiple atypical mucosal xanthomas in a dog similar to human verruciform xanthoma. J. Vet. Diagn. Invest., 21: 124-128.
8. Hargis, A.M. and P.E. Ginn, 2007. The integument. In: Pathologic basis of veterinary disease, McGavin MD, Zachary JF, 4th edition, Mosby Elsevier, St. Louis, MO, pp: 1236-1238.
9. Souza, M.J., N.S. Johnstone-McLean, D. Ward and K. Newkirk, 2009. Conjunctival xanthoma in a blue and gold macaw (*Ara ararauna*). Vet. Ophthalmol., 12(1): 53-55.
10. Rekha, A. and D.K. Rai, 2010. Tendon xanthomas. The Foot, 20: 85-86.
11. Grundy, S.M., 1999. Xanthomatoses and lipoprotein disorders. In: I.M. Freedberg, A.Z. Eisen, K. Wolff, *et al*. eds. Fitzpatrick's dermatology in general medicine. 5th edition, McGraw-Hill, New York, pp: 1804-1811.
12. Scott, D.W., W.H. Miller and C.E. Griffin, 2001. Endocrine and metabolic diseases. In: Muller and Kirk's small animal dermatology, 6th edition. Philadelphia, WB. Saunders, 873-874, 1148-1153.
13. Lightfoot, T.L., 2006. Overview of tumors: Section I. In: Harrison GJ, Lightfoot TL, eds. Clinical avian medicine. Spix Publishing, Inc., Palm Beach, FL, pp: 560-565.

14. Campbell, T.C., 1994. Cytology. In: B.W. Ritchie, G.J. Harrison and L.R. Harrison, eds. Avian medicine and surgery: Principals and Application. Wingers Publishing, Lake Worth, pp: 200-222.
15. Jones, T.C., R.D. Hunt and N.W. King, 1997. The skin and its appendages. In: Jones TC, Hunt RD, King NW. Veterinary pathology. Williams and Wilkins, Baltimore.
16. Reavill, D.R., 2004. Tumors of pet birds. In: J.E. Graham, ed. Veterinary clinics of North America Exotic Animal Practice, 7: 537-560.
17. Wisselink, M.A., J.P. Koeman, T.H. Wensing, J. De Bruijne and T. Willemse, 1994. Hyperlipoproteinaemia associated with atherosclerosis and cutaneous xanthomatosis in a cat. Vet. Q., 16: 199-202.
18. Chanut, F., M.A. Colle, J.Y. Deschamps, O. Albaric and M. Wyers, 2005. Systemic xanthomatosis associated with hyperchylomicronaemia in a cat. J. Vet. Med. A., 52: 272-274.
19. Nayak, K.R. and R.G. Daly, 2004. Eruptive xanthomas associated with hypertriglyceridemia and new-onset diabetes mellitus. N. Engl. J. Med., 350: 1235.
20. Sibley, C. and N.J. Stone, 2006. Familial hypercholesterolemia: a challenge of diagnosis and therapy. Cleve. Clin. J. Med., 73(1): 57-64.
21. White, L.E., 2009. Xanthomatoses and lipoprotein disorders. In: Freedberg *et al*. Eds. Fitzpatrick's dermatology in general medicine, 7th edition, McGraw-Hill Inc., pp: 1272-1281.
22. Gumbrell, R.C., 1972. A case of multiple xanthomatosis and diabetes mellitus in a dog. N. Z. Vet. J., 20: 240-242.
23. Chastain, C.B. and C.L. Graham, 1978. Xanthomatosis secondary to diabetes mellitus in a dog. J. Am. Vet. Med. Assoc., 172: 1209-1211.
24. Jones, B.R., W.S. Hancock and C.H. Campbell, 1983. Occurrence of idiopathic, familial hyperchylomicronaemia in a cat. Vet. Rec., 112: 543-547.
25. Hoekstra, K.A., C.R. Nichols, M.E. Garnett, D.V. Godin and K.M. Cheng, 1998. Dietary cholesterol-induced xanthomatosis in atherosclerosis-susceptible Japanese quail (*Cotunix japonica*). J. Com. Pathol., 119: 419-27.
26. Schmidt, R.E., 1997. Neoplastic diseases. In: R.B. Altman, S.L. Clubb, G.M. Dorrestein and K. Quesenberry, editors. Avian medicine and surgery. Saunders, Philadelphia, pp: 590-599.
27. Monks, D.J., H.P. Zsivanovits, J.E. Cooper and N.A. Forbes, 2006. Successful treatment of tracheal xanthogranulomatosis in a red-tailed hawk (Buteo jamaicensis) by tracheal resection and anastamosis. J. Avian. Med. Surg., 20: 247-252.
28. Jaensch, S.M., R. Butler, A. O'Hara, S.R. Raidal and K. Wyatt, 2002. Atypical multiple, papilliform, xanthomatous, cutaneous neoplasia in a goose (Anser anser). Aust. Vet. J., 80(5): 277-280.