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 cm³) 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
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.

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).

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 or 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. Abnormalities 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 intracytoplasmic 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


