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Case Report

Sebaceous gland adenoma in an ovariohysterectomized female mixed-breed dog

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ABSTRACT

Sebaceous gland neoplasms are one of the cutaneous neoplasms in the canine. A 5-year-old ovary hysterectomy female, mixed breed terrier was referred to veterinary clinic of the Islamic Azad University, Shahrekord Branch due to a mass in the head area. The morphological characteristics of the lesion revealed an encapsulated, round, solitary yellowish-white mass, relatively soft consistency with an approximate diameter of 9 mm in the right midline the forehead and calvarium area with minor hair loss. Next, a complete excisional biopsy was done for pathology diagnosis. After dehydration, clearing and impregnated with paraffin, a tissue sample was stained with Hematoxylin and Eosin method. The microscopic characteristics of the tumor mass showed two different cell types, including mature sebaceous gland cells with vacuolated cytoplasm and small hyperchromic nucleus, and several rows of basaloid cells around sebaceous glands without mitotic division that were not adjacent to hair follicles. Inside several follicles, sections of the middle parts of demodex's body were observed. Our report is a unique example of sebaceous adenoma with infection of hair follicles with demodex mites in an ovariohysterectomy in female dog.

آدنوم غده سباسه در یک سگ ماده اورایوهیسترکتومی شده نژاد مخلوط

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چکیده

نئوپلاسم‌های غدد سباسئوس به‌عنوان یکی از نئوپلاسم‌های پوستی در سگ هستند. یک قلاده سگ ماده اواریوهیسترکتومی شده ۵ ساله، نژاد تریر آمیخته با مشخصات مورفولوژیک توده‌ی زیر پوستی محصور، مدور، منفرد به رنگ سفید مایل به زرد، قوام نسبتا نرم و با قطر تقریبی ۹ میلی متر در حد واسط سمت راست منطقه پیشانی و کاروایوم با موریختگی خفیف به کلینیک دانشکده دامپزشکی دانشگاه آزاد اسلامی واحد شهرکرد ارجاع داده شد. سپس به روش جراحی بصورت کامل جهت تشخیص آسیب شناسی برداشته و در داخل فرمالین بافر ۱۰ درصد قرار گرفت. پس از مراحل آب گیری، شفاف سازی و آغشتگی با پارافین، به روش رنگ آمیزی با هماتوکسیلین و ائوزین رنگ آمیزی شد. مشخصات میکروسکوپیک توده توموری دو نوع سلول مختلف شامل سلول‌های غدد سباسوس بالغ با سیتوپلاسم واکوئله و هسته کوچک هیپرکروم و چند ردیف سلول‌های بازالوئید سل در پیرامون لبول‌های سباسئوس بدون تقسیم میتوز که با فولیکول های مو ارتباط نداشت را نشان داد. در داخل چند فولیکول مقاطعی از اجزاء میانی بدن دمودکس مشاهده شد. گزارش ما یک نمونه منحصر به فرد از سباسئوس آدنوما با آلودگی فولیکول‌های مو با مایت دمودکس در یک سگ ماده عقیم شده است.

واژه های کلیدی: هیستوپاتولوژی، نئوپلاسم های غده سباسه، سلول بازالوئید ، برداشت کامل نمونه

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INTRODUCTION

The most common diseases in small breed dogs include: skin diseases, otitis externa, gastrointestinal diseases, respiratory diseases, lameness, *Malassezia* yeast infection and some mixed breeds are prone to congenital and inherited diseases [1]. The prevalence of these diseases depends on age, management and maintenance [2]. The secretory structures consist of a series of acini and ducts originating from the outer sheath of the hair follicles [3]. Sebaceous glands are distributed throughout the surface of the hairy skin, especially in the head and neck, and most of them are involved in the metabolism and biosynthesis of androgen hormones [4]. Benign and malignant neoplasms are one of the most common causes of mortality in dogs [5]. Sebaceous gland neoplasms are one of the most common skin tumors in the dogs [6]. This type of neoplasia is the third most common type of skin tumor [7]. Appearance of sebaceous neoplasms includes round, raised, sessile or pedunculated [8], and based on microscopic features, all sebaceous nodular diseases include sebaceous nodular hyperplasia, sebaceous adenoma, sebaceous epithelium, sebaceous adenocarcinoma (well, moderately, and poorly differentiated) that are classified according to their shape features and histopathological appearance [9, 10]. Sebaceous adenoma is a benign neoplasm with irregular sebaceous glands lobules with a less distinct architectural and structural pattern with single or small sebaceous cells and mature and vacuole sebaceous glands, often associated with sebaceous ducts and supported by eosinophilic connective tissue stroma. Benign neoplasm composed of differentiated sebaceous cells containing intracytoplasmic vacuoles and undifferentiated basaloid cells layers are situated at the lobular margin [11]. The pattern of basaloid cell accumulation can be reticular, cribriform plate, or even labyrinth-like pattern [11]. Most studies have indicated that the etiology sebaceous adenoma is likely multifactorial and still not well or poorly understood [12]. But factors associated with the occurrence of this tumor including prolonged exposure to ultraviolet light, low gene expression of estrogen receptor-α and progesterone receptor in the sebaceous glands [13], and systemic disease [8]. Thus, the aim of this study was to evaluate the macroscopic, microscopic and treatment of sebaceous adenoma in mixed breed terrier dogs who had ovariohysterectomized, and also to review the literature on similar cases.

CASE PRESENTATION

In May 2021, a 5-year-old ovariohysterectomized female Terrier mixed with a weight of 3.7 kg was referred to the veterinary clinic of the Islamic Azad University, Shahrekord Branch with

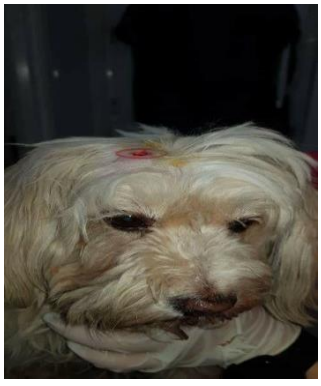

Figure 1. Solitary yellowish hue 9-mm papule endophytic growth on the calvarium in the right midline of the canine mixed breed terrier.

morphological characteristics of circumscribed, round, solitary yellowish hue papule with a diameter of approximately 9 mm between skin and subcutaneous tissue common border the forehead and calvarium in the right midline and with relatively soft consistency, without base and partial wound surface with slight swelling on the periphery of the tumor with very slow growth (Figure 1). After clinical examination, 2 mg/kg xylazine (2% Alfasan, Worded, Netherlands) and 5 mg/kg ketamine (10% Alfasan, Worded, Netherlands) injections were used intravenously respectively for sedation and analgesia. Surrounding skin lesion was shaved off using an electric and the area was disinfected with 70% alcohol and 2% povidone-iodine. Then, by injection lidocaine around the lesion and fusiform circle incision in the margins around the mass, the nodular lesion was completely and deeply removed with 5 mm margins under aseptic conditions. The incision site was then sutured with non-absorbable suture 1 and the horizontal pattern of the matrix [14]. The tumor sample was placed in 10% formalin buffer for 36 hours. After dehydration, clearing and impregnated with paraffin, 5-micron thick sections were cut and stained with hematoxylin and eosin. No recurrence of the tumor was observed 6 months after complete resection of the tumor (November 2021).

Histopathological evaluation

Microscopic characteristics of this tumoral mass was observed in the form of sebaceous lobes with relatively abnormal structure that was non-uniform in size with single or small clusters and mature sebocytes with vacuolated cytoplasm and small hyperchromatic nucleus with nucleus to cytoplasm ratio at a minimum. Undifferentiated peripheral cells in the form of oval, banana-shaped, solitary round or complex colonies with little cytoplasm as a sheet like pattern without mitotic divisions around the sebaceous glands, which were often associated with sebaceous ducts and eosinophilic connective stromal scaffold in the area. There were two or more basaloid cells layers at the around of the mature sebocytes well differentiation lobules. Also, aggregations of undifferentiated basaloid cells were observed between the sebaceous glands and the deep layer of the dermis (Figure 2A). Additionally, within a small number of the follicle's sections of the middle body, parts of

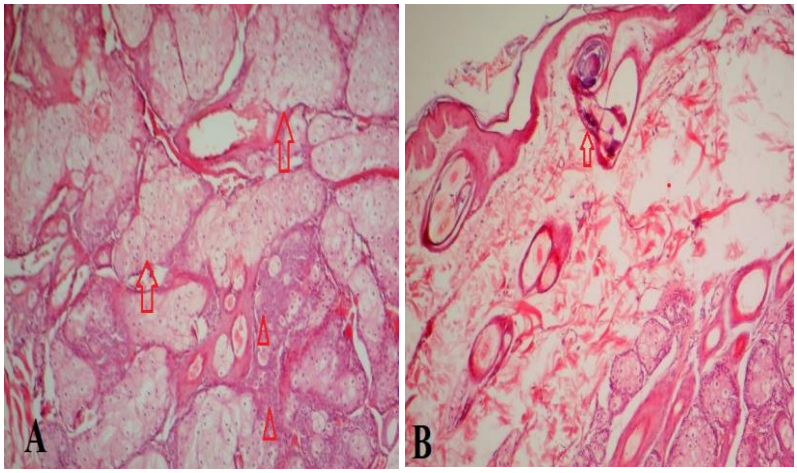

Figure 2. (A) Sebaceous gland adenoma. Well-circumscribed organoid sebaceous lobules in the dermis (arrow) and show varying amounts of immature basaloid cell proliferation at the periphery of each lobule without any nuclear pleomorphism or mitosis (arrowhead). (H&E×100). (B) *Demodex mites* in the hair follicle of skin (arrow) (H&E×40).

demodex were observed. The diagnosis of sebaceous adenoma coincided with demodicosis in this sterilized female dog (Figure 2B).

DISCUSSION

High-density sebaceous glands are found in the head and neck region which are responsible for the production and secretion an oily or waxy substance, called sebum [15]. When the sebaceous gland reaches a certain size, the secretion is of the holocrine type [16, 17]. Macroscopic observations of sebaceous adenoma revealed partial loss hair of the surface and surrounding of the lesion, fine itching, and mild ulceration which may be associated with sebaceous adenomas. A histopathologic study of this lesion identified the sebaceous lobules in the dermis which were very limited and somewhat symmetrical. Based on the characteristic pathologic features basaloid germinative cells with larger vesicular nuclei at the margine of the lobule and the sebaceous cells are located centrally with a distinctive organoid pattern (Figure 2A). In the deep layers of the dermis, density of aggregate immature basaloid cells without mitotic division was observed that is in conformity with the findings of other studies [18]. The lobules of the sebaceous glands were separated by connective tissue or filaments of epithelial tissue, which is consistent with previous reports [19]. The distinguishing feature of sebaceous adenoma from sebaceous hyperplasia is the proliferation of basaloid cells beyond normal in one to two layers compared to sebaceous hyperplasia [20,21]. In trained dogs, the age of onset of this tumor most commonly occurs in 3 to 18 years old and more males than females. This tumor usually occurs on the eyelid, head, neck, and frontal limb [22]. Although the etiology and pathogenesis of sebaceous gland tumors are not well understood, recent studies have shown that sebaceous glands are one of the target organs for estrogen and androgens and may modulate their function [23]. The absence of hormone receptors (androgen receptors, alpha-beta estrogen, and progesterone) in skin appendages may be a factor in tumor progression or Carcinogenesis processes [24]. The natural expression of alpha estrogen receptors and the expression of all androgens on the sebaceous glands have anti-proliferative effects [25]. Therefore, alpha estrogen receptors play a crucial role in maintaining the physiology of epidermis, dermis, hair follicle and the sebaceous glands [24, 26]. Therefore, ovarian hysterectomy may be a valid reason for the occurrence of sebaceous adenoma in the case under study with reducing the expression of estrogen and androgen receptors. The findings of Kariya et al. (2005) showed that the function of the apocrine and eccrine sweat glands in humans may be affected by steroid sex hormones [24]. Androgens, progesterone and estrogens are predominant nutrients in the growth and physiology of the sebaceous [25]. In the present report, demodex mites have been identified in hair follicles without inflammatory cellular reaction in the dermis but reduction in the number of epidermal cells were observed. Previous studies on sebaceous epithelium have reported the presence of mononuclear inflammatory cells around the sebaceous glands [27-29]. In female laboratory animals, after ovariectomy the melanin content of epidermal melanocytes decreases; many became smaller in size and exhibited shortened dendritic processes [26], that can be one of the factors reducing the thickness of the epidermis due to exposure to ultraviolet radiation. Previous studies have confirmed the recurrence of sebaceous adenoma after incisional biopsy [30].

However, in the present study, six months after complete excisional biopsies of the tumor with a clean margin without radiation therapy or adjuvant therapy, recurrence of sebaceous adenoma was not observed. Therefore, complete resection of the tumor is the best treatment, although this tumor is radiosensitive. Our report is a unique example because sebaceous adenoma was examined by local infection of hair follicles with demodex mites in mixed breed dog after spay. However, the role of demodex mites and low levels of estrogen and progesterone after ovariohysterectomy in the development of skin cell tumors are still unclear.

ETHICS

Approved.

CONFLICT OF INTEREST

None declared.

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