Congenital synchronous adenomas of meibomian and moll glands of the eyelid in a calf

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ABSTRACT: This report describes meibomian adenoma (MA) and moll gland adenoma in a female, 1.5-months-old, crossbreed calf. Macroscopically, the mass was 3 × 1.5 × 0.5 cm in size and 5.35 g in weight; its shape was gray-reddish and it was localized on the right lower eyelid. Microscopically, the mass was composed of lobules of various sizes separated with a septum, which included well-differentiated sebaceous cells and apocrine secretory epithelium, with no an association of both gland types.

Keywords: eyelid; meibomian gland; moll gland; adenoma; calf

Glands of the eyelid consist of sebaceous glands such as meibomian (tarsal) and Zeis glands that opens to hair follicles and moll glands that have modified sweat gland characteristics (Goldschmidt and Shofer, 1992; Dellman and Eurell, 1998; Johnson et al., 1999; McGavin et al., 2001). Meibomian glands are found on the tarsal plate and are responsible from the formation of an oily layer over the thin film of tear (Junqueira et al., 1998; Mushtak et al., 1990). Moll glands have apocrine secretion and leave their secretions inside the eyelash follicles (Hirai et al., 1997; McGavin et al., 2001).

Most of the tumors that are localized on the eyelids are either meibomian tumors or benign melanomas and papillomas, and are common in dogs and rare in other species. Malignant tumors such as the adenocarcinomas of the sebaceous glands, basal cell adenocarcinomas, mast cell tumors and melanomas are tumoral masses of lesser frequency (Moulton, 1990; Hirai et al., 1997).

Sebaceous and apocrine sweat gland adenomas can be single or multiple while localizing to the skin or to the eyelid, they are most commonly seen in elderly dogs, but can also be rarely observed in other domestic animal species (Moulton, 1990; Hirai et al., 1997; McGavin et al., 2001; Goldschmidt and Hendrick, 2002). In the veterinary literature, there is no case report about the coexistence of benign tumors of both glands. The case we present might be of interest as it is the first case having both meibomian and sweat gland tumors on the eyelid of a calf; thus we found it appropriate to make the description of these masses.

Case history

The subject material of this presentation was an 1.5-month-old Simental crossbreed calf. In the inner part of its right lower eyelid, an oval tumor formation of 3 × 1.5 × 0.5 cm, weighing 5.35 g with gray reddish color was observed (Figure 1). The history revealed that the mass had formed congenitally on the inner surface of the right lower eyelid and had not grown considerably afterwards. The mass on the eyelid was surgically excised under local anesthesia. After being fixed with 10% neutral buffered formalin solution, it was embedded in paraffin following the routine processing. 5-micron-thick sections obtained from the paraffin blocks were stained with hematoxylin-eosin (HE) and periodic acid-Schiff (PAS) techniques and then examined

Figure 1. The gray-reddish mass on the lower eyelid of the calf

under light microscope. Additional sections were also obtained to be evaluated immunohistochemically with avidine-biotin-peroxidase complex (ABC) method using monoclonal antibodies such as mouse anti-pancytokeratin (Dako), mouse anti-alpha smooth muscle actin (ASMA) (Novocastra) and anti-vimentin (Dako).

In the microscopic examination there were two separate types of cells within the mass that could be easily differentiated from each other. One of cell gropus was sebaceous; they were well differentiated, of various sizes, having round and vesicular nuclei, forming lobules (Figure 2B); surrounding these cells there were undifferentiated basal cell groups. The lobular structures were separated from the periphery with a well-defined margin and they were mostly of irregular shape and size. Surrounding certain lobules, there were solid undifferentiated cellular clusters with oval nuclei and pale cytoplasm (Figure 2A). Undifferentiated cell

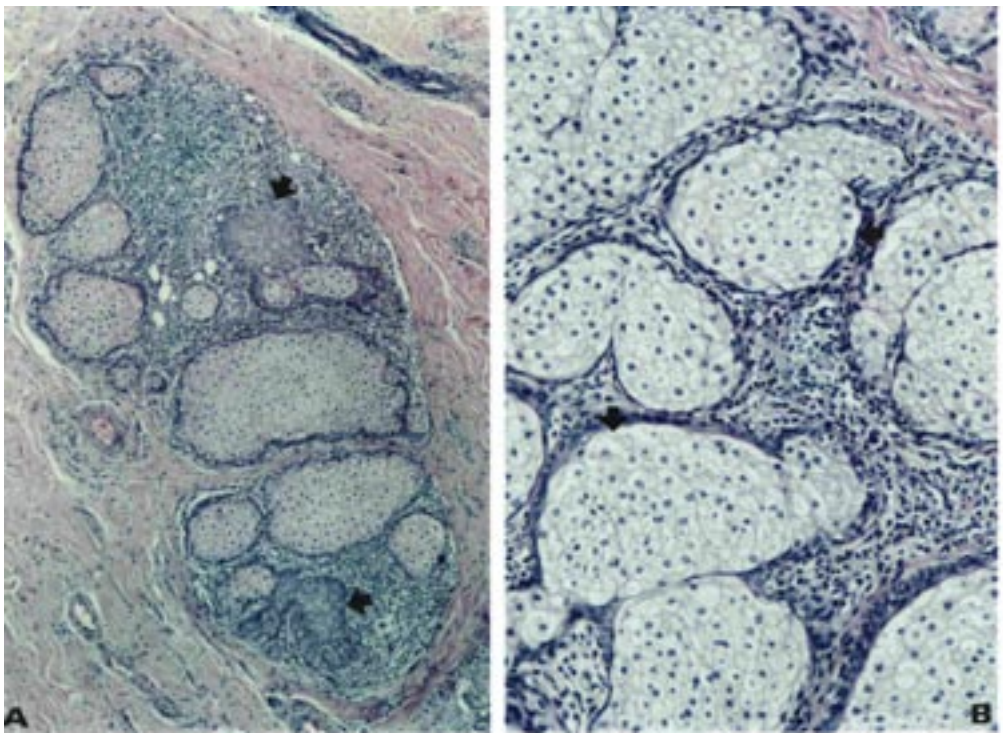

Figure 2. (A) Microscopic appearance of undifferantiated basal cells group (arrows) on the surrounding sebaceous lobules, hematoxylin and eosin, magnification 80×; (B) Differantiated sebaceous cell lobules (arrows), hematoxylin and eosin, magnification 200×

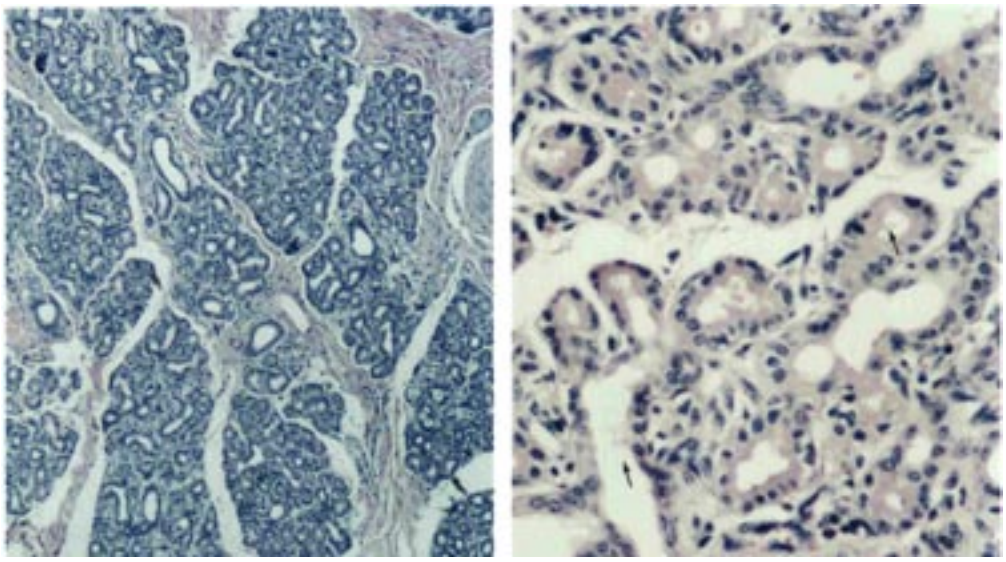

Figure 3. (A) Microscopic appearrance well differantiated tubul and acinus of moll glands, hematoxylin and eosin, magnification 80×; (B) Apical decapitation of moll glands (arrows), hematoxylin and eosin, magnification 200×

groups around the lobules were basal cells of lighter color, and had oval or round nuclei.

The lobules of other cell groups were separated from each other with a septum composed of fibrovascular connective tissue, and there were several tubular and acinar structures of similar alignment. Acinar and tubular structures were lined with well-differentiated cubic to columnar epithelial cells having eosinophilic cytoplasm, with oval or round nuclei (Figure 3A). In the surfaces of these structures that are facing the lumen and within their lumen there was secretion of apocrine nature (apical bleb) with basophilic appearance (Figure 3B). Some of the secretory ducts in the lobules were dilated and the epithelium showed mild squamous metaplasia. The differentiated tubular or acinar structures were surrounded by the undifferentiated basal cell clusters with clear cytoplasm and nuclei. Among the neoplastic cell groups within the lobules, there were few mitotic figures. There were lymphocyte and plasma cell infiltrations of mild degree around the lobules and of severe degree in the subepithelial fields. The mass did not have any invasion to the subconjunctival tissues or the orbita.

Immunohistochemically, both cell groups was negative for vimentin and pancytokeratin. The basal layer of the acini in the apocrine type modi-

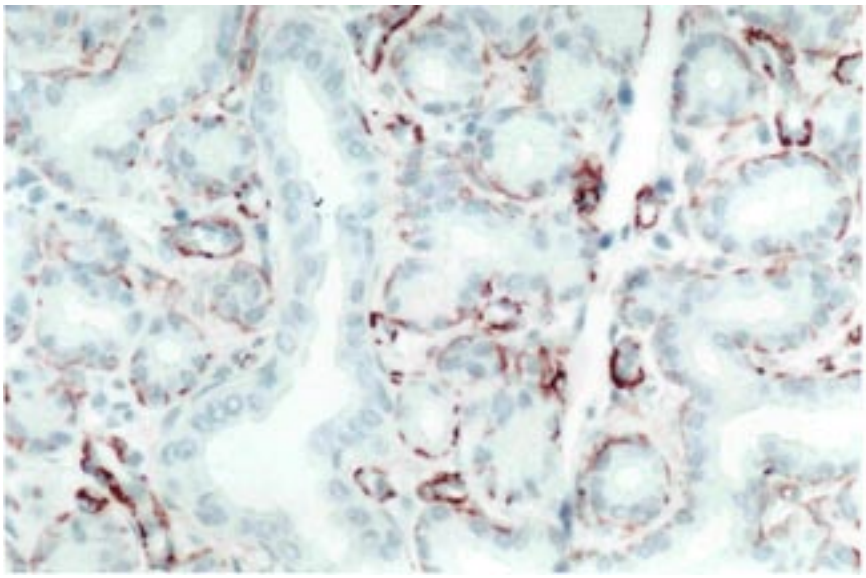

Figure 4. Positive ASMA immunostaining on the basal membrane tubul and acinus of moll glands. ABC method, Mayer's hematoxylin counterstain, magnification 200×

fied sweat gland adenoma was ASMA positive (Figure 4) while sebaceous glands were negative.

DISCUSSION

Neoplastic changes of the sebaceous glands of the eyelid are classified as nodular hyperplasia, epithelioma, adenoma and adenocarcinoma (Johnson et al., 1999). Cell groups of the sebaceous epithelioma are in the form of not well-differentiated basal cell clusters without constituting lobular structures and the cells contain pigments (Moulton, 1990; Johnson et al., 1999; Goldschmidt and Hendrick, 2002). Sebaceous hyperplasia can be defined as the hyperplastic lobes of the mature sebaceous cells that surround large sebaceous ducts (Goldschmidt and Hendrick, 2002). In sebaceous adenocarcinoma, epithelial cells and basal cells have the same alignment yet they have local invasive features and in their cytoplasms they have vacuoles containing lipid droplets (Johnson et al., 1999). Macroscopically, MA can be small, papillomatous, exophytic and most of the tumor mass can be localized within the deep tissues. They localize to the inner surface of the eyelid and are brown-black or pale red in color (Goldschmidt and Hendrick, 2002). Their histological features resemble to those of the sebaceous tumors of the skin (Goldschmidt and Hendrick, 2002). MA consists of lobular structures of different sizes, well-differentiated sebaceous cells of regular distribution among these lobules and undifferentiated basal cells surrounding both of these structures (Allison and Moeller, 1993; Johnson et al., 1999; McGavin et al., 2001). There is significant amount of melanin pigment in most of the presented cases (Goldschmidt and Hendrick, 2002). In the microscopic examination of this case there was no melanin pigment identified, however, there were similarities with the other changes reported for MA in the literature.

Modified sweat gland adenomas of the eyelid consist of differentiated acinar and tubular structures are lined with cubic or columnar epithelial cells having round nuclei and eosinophilic cytoplasm (Hirai et al., 1997). Within the lumens of these structures and on the surfaces of the acini facing the lumen there lies a PAS positive basophilic secretion (Hirai et al., 1997; Gulbahar et al., 2002; Simko et al., 2003). The changes reported in the modified sweat glands of this case were as well having similarities with those reported in the literature.

Myoepithelial cells that surround the benign tubular or acinar structures were reported to be immunoreactive to ASMA (Moulton, 1990). In the immunoperoxidase staining performed in this case, the basal parts of the acini of the apocrine type modified sweat gland were ASMA positive, whereas sebaceous glands were negative. This demonstrated that there were no myoepithelial cells around the sebaceous cells. Both tumor tissues gave negative results for cytokeratin and vimentin immunostaining.

Sebaceous adenomas are reported to be more frequent in elderly dogs and cats when compared to other domestic animal species, females also have more number of adenomas compared to males (Moulton, 1990). Our case was also a female calf however as it was a single case no comparison could be made.

In humans (Ho, 2002), upper eyelid which was richer in meibomian glands was reported to be more sensitive to neoplastic changes when compared to the lower eyelid. The tumor in our case was localized to the lower eyelid.

If not totally excised or removed, adenomas of the eyelid can recur and gain malignant characteristics (Johnson et al., 1999). The surgical intervention in this case was curative; after the removal of the tumoral mass, no recurrence has been reported by the owner of the animal.

In dogs, 88% of the tumoral masses of the eyelid are benign and 8.2% are reported as being malignant (Hirai et al., 1997). The most commonly observed eyelid tumor of the bovine is squamous cell carcinomas (Moulton, 1990; McGavin et al., 2001). The histopathological examination of our case helped as arrive at the diagnosis of complex congenital tumor consisting of meibomian gland adenoma originating from the tarsal glands of the eyelid and moll gland adenoma which originates from modified sweat glands.

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