



NEOPLASTIC DISEASE

Congenital Cutaneous Panadnexal Papillomatous Hamartomas in a Calf

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Summary

Several cauliflower-like alopecic masses arose on the head of an otherwise healthy, full-term newborn Jersey × Belgian blue heifer, which was humanely destroyed shortly after birth due to the severity of the skin lesions. Microscopically, the masses were composed of multiple papillary projections displaying well-differentiated sebaceous glands surrounded by a moderate number of well-developed sweat glands, as well as embryonic and fully developed, but dysplastic hair follicles. Thick branching connective tissue stalks supported these adnexal components. The papillated surface, the predominance of sebaceous glands, the presence of embryonic hair follicles and the well-differentiated sweat glands were compatible with nevus sebaceous, a rare form of cutaneous hamartoma described in man, dogs, cats and cattle. However, the cauliflower-like growth pattern, the presence of supportive thick branching connective tissue stalks and the relative abundance of dysplastic hair follicles in association with nevus sebaceous has not been described in the human or veterinary literature. A diagnosis of panadnexal papillomatous hamartoma was made in this case.

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Hamartomas are congenital, non-neoplastic malformations composed either of an abnormal mixture of several normal tissue elements or of an abnormal proportion of one tissue element in its normal location (Mauldin and Peters-Kennedy, 2016). Several different cutaneous hamartomas have been described in man, where the term ‘nevus’ is applied variably. Classification of hamartomas and nevi is made according to the predominant tissue elements and the respective growth pattern. In man, basaloid follicular, dermal melanocytic, eccrine, angiomatous, fibrous, hair follicle and smooth muscle hamartomas, as well as nevus sebaceous of Jadassohn (also known as nevus sebaceous or organoid nevus), verrucosus and flammeus have been described (Stewart *et al.*, 2015).

Several types of cutaneous hamartomas are reported in domestic animals. In dogs, fibroadnexal hamartomas are common, while follicular, sweat gland, epidermal, collagenous and sebaceous hamartomas and nevus sebaceous are diagnosed occasionally (Gross *et al.*, 2005; Goldschmidt and Goldschmidt, 2016; Mauldin and Peters-Kennedy, 2016). In cats, epidermal and sweat gland hamartomas and nevus sebaceous occur rarely (Gross *et al.*, 2005; Goldschmidt and Goldschmidt, 2016). Trichofolliculomas are also classified as being cutaneous hamartomas and are rare in dogs and cats (Mauldin and Peters-Kennedy, 2016). In horses, several cases of epithelial hamartomas (also called ‘congenital papillomas’) have been described in young foals and fetuses, while linear epidermal hamartomas are described in Belgian horses aged between 6 months and 1 year (Scott and Miller,

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2011). In swine, an epitrichial sweat gland hamartoma on the head (Gourreau *et al.*, 2008), a folliculoe-pitrichial sweat gland hamartoma on the pinna (Scott, 2007) and three fibroepithelial hamartomas have been described (Rieke, 1980; Vítovec *et al.*, 1999; Sipos *et al.*, 2007).

In cattle, nevus sebaceous is described in the literature, but is rare (Scott, 1988; Valentine and Barrell, 2016) and poorly characterized. Mauldin and Peters-Kennedy (2016) suggested that a case of congenital papillomatosis that was originally thought to be caused by an infection with bovine papillomavirus type 3 (BPV-3) in a 1-year-old Holstein heifer (Desrochers *et al.*, 1994) was, in fact, a cutaneous hamartoma. Additionally, in a survey of cutaneous neoplasia in cattle, performed between 1977 and 1996 in Israel, vascular cutaneous hamartomas were detected in different locations in three healthy newborn calves (Yeruham *et al.*, 1999). However, vascular hamartomas can be found in the spleen, heart, lung, liver, testicles, subcutaneous tissue (Madewell and Theilen, 1987) and in the oral cavity (Sheahan and Donnelly, 1981; Stanton *et al.*, 1984; Mohammadi *et al.*, 2007; Rösti *et al.*, 2013) and are therefore not specific for the skin.

In June 2016, a full-term Jersey × Belgian blue heifer was born after a non-eventful gestation period of 278 days. The calf had multiple masses on the head, but was otherwise healthy. Due to the extent of the cutaneous lesions the calf was humanely destroyed. The head and upper neck were submitted for examination to the University of Copenhagen, Denmark.

Gross examination revealed two oval-shaped, non-encapsulated, lobulated, well circumscribed, exophytic cauliflower-like, alopecic masses in the midline of the dorsal surface of the skull. The masses measured 11.5 × 8.0 × 2.5 cm (anterior mass; white and black pigmentation) and 12 × 8.3 × 2.5 cm (posterior mass; black pigmentation) (Fig. 1). On the cut surface, the masses were composed of numerous papillated projections covered by pigmented or non-pigmented epidermis and supported by thick fibrous tissue stalks. These were connected to a broad fibrous tissue band, which was horizontally associated with the looser connective tissue of the dermis. The lateral borders of the masses were well defined (Fig. 2). The underlying bone of the skull, the brain and the lymph nodes of the head were macroscopically normal. In addition to these two larger masses, in the skin lateral to the nostrils, there were multiple black, smooth, smaller masses measuring up to 0.5 cm in diameter. A single, smooth, black mass (1 cm) was attached to the skin near the lateral canthus of the left eye.



Fig. 1. Two masses located in the midline of the dorsal surface of the skull. Bar, 5 cm.

Samples of the cutaneous lesions, the submandibular and retropharyngeal lymph nodes and the brain were fixed in 10% neutral buffered formalin, processed routinely and embedded in paraffin wax. Sections (2–3 µm) were stained with haematoxylin and eosin (HE). Microscopically, the anterior and posterior masses were identical, with the exception of having different pigmentation of the epidermis (Fig. 2). Both masses were composed of multiple papillary projections supported by abundant branching



Fig. 2. Cut surface of the two masses shown in Fig. 1. The papillated growth pattern is supported by thick connective tissue stalks connected to a broad connective tissue band above the dermis. Differential pigmentation is observed. Bar, 1 cm.

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