Unilateral Corneoscleral Choristomas (Corneal Dermoids) in A White-Tailed Deer (Odocoileus virginianus)

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ABSTRACT: Multiple, nodular, pigmented masses protruding from the cornea and adjacent sclera of the left eye of a white-tailed deer (Odocoileus virginianus) were diagnosed as choristomas (dermoids). Microscopically, the masses contained well-differentiated skin, cartilage, and bone. This appears to be the first report of a corneoscleral choristoma in a cervid.

Corneal dermoids, or epibulbar dermoids, are congenital anomalies of the cornea or conjunctiva that are characterized by skin-like differentiation and are frequently located at the corneal limbus. These typically benign masses are identified as choristomas because of the proliferation of well-differentiated tissues not normally encountered on the surface of the eye (Wilcock, 2007). Such masses can stem from a developmental defect that causes stromal mesenchyme to induce skin instead of normal corneal epithelium (Wilcock, 2007). Corneal choristomas frequently contain elements of normal skin, including epidermis, dermis, fat, hair follicles, sweat glands, and rarely bone or cartilage (Slatter, 2001; Wilcock, 2007). They are believed to occur spontaneously and are usually slow growing and incidental. However, epiphora and keratitis can occur from irritation of the corneal surface by hair from the mass (Martin, 2005). We describe corneal choristomas found on the eye of a white-tailed deer (Odocoileus virginianus). Corneal choristomas have been reported in many domestic animals but are rare (Martin, 2005). There are no known occurrences of corneal choristomas in white-tailed deer or other species of the family Cervidae.

A 1.5-yr-old, female white-tailed deer was collected by a hunter in St. Mary parish, Louisiana (29°55’N, 91°29’W), on 28 November 2007. The deer appeared healthy except for multiple nodules on its left cornea and one small nodule on its left, lower eyelid. There was also one, firm, hairless, cutaneous nodule on the distal aspect of a rear leg that was consistent with a cutaneous fibroma. The head was removed by personnel of the Louisiana Department of Wildlife and Fisheries and shipped to the Southeastern Cooperative Wildlife Disease Study, Athens, Georgia, for diagnostic examination.

The left eye had three raised nodular masses adherent to the cornea and adjacent sclera that were 2×1.5×1 cm to 1.7×1.7×1 cm, brown to black, and firm (Fig. 1). The left lower eyelid had a 0.5-cm-diameter, slightly elevated mass adjacent to the medial canthus. On cut surfaces, the larger corneoscleral masses and the smaller eyelid mass were all firm, multinodular, and mottled brown to white. The cornea was white and opaque. No other gross lesions were apparent on the head. The skin nodule from the rear leg was not submitted.

Both eyes were fixed in Davidson’s solution and were processed for routine histopathology. Five-micrometer-thick sections cut from paraffin-embedded tissues were mounted on microscope slides, rehydrated, and stained by hematoxylin and eosin.

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Well-differentiated cartilage was present in the deeper portions of all three masses, and the center of one contained woven bone. The surface of the masses was covered by epidermis, with abundant melanin. Cells of the stratum basale and stratum corneum, at rare foci, were variably swollen and separated by clear space (intracellular and intercellular edema). The superficial connective tissue of the nodules contained a moderate number of lymphocytes and plasma cells, often aggregated around blood vessels. Microscopic features of all three corneoscleral masses were diagnostic for choristomas. Areas of the cornea distant from the nodules appeared normal, and the opacity observed grossly was presumably due to autolysis with postmortem fluid imbalance in the corneal stroma.

The smaller nodule on the lower eyelid consisted of a cystic tarsal gland (Meibomian gland) surrounded by fibrous, connective tissue. The adjacent conjunctiva was variably eroded or ulcerated, and the submucosa was expanded by edema. This may have resulted from mechanical obstruction of the duct by the closely apposed choristoma at the medial aspect of the eye.

A possible differential diagnosis for a periocular mass in a deer is a cutaneous fibroma, the most common cutaneous tumor affecting white-tailed deer. The surface of cutaneous fibromas is often sparsely haired and darkly pigmented, and they occur most commonly on young deer, often on the skin of the face and around the eyes (Sundberg and Nielsen, 1981). Cutaneous fibromas are not known to occur on the corneas of deer, but they can affect the eyelids. Microscopically, they are distinguished by abundant, relatively mature, fibrous connective tissue that separates hair follicles and sebaceous glands, often resulting in their atrophy (Ginn et al., 2007). The masses from this deer were easily distinguished from a cutaneous fibroma because they consisted of densely haired skin supported by loosely organized, connective tissue with abundant adipocytes, cartilage, and bone.

This is apparently the first reported case of a corneal choristoma in a cervid. There are two reports of intraocular choristomas...
in white-tailed deer, but in both reports, the affected deer had bilateral microphthalmia and were fawns <7 months old. The intraocular choristomas, in each case, effaced the iris and ciliary body and consisted of haphazardly arranged ocular tissues, with no dermoid differentiation (Wyand et al., 1972; Fulton et al., 1977). The choristomas in the present case were distinguished from those cases of intraocular choristomas because they were unilateral, protruded from the cornea of an otherwise normal eye, and contained hair follicles, adnexal glands, and other tissues normally associated with haired skin.

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LITERATURE CITED


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