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Easily removed hair and skin in a newborn calf

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When a pregnant Black Angus heifer, nine-days overdue for giving birth, experienced dystocia, the owner stated that he had “pulled the calf without difficulty”. Furthermore, he reported that the cow had licked patches of hair off the calf. The calf could not stand and its eyes were, “rolled back in its head.” Consequently, the owner euthanized the calf to prevent it from needless suffering and submitted it for a necropsy.

The Black Angus heifer had been bred by artificial insemination. It was maintained on a 259-hectare (640 acre) pasture covered with orchard grass, fescue, rye and a small amount of alfalfa; in addition, 38% protein supplement blocks containing salt, magnesium, selenium, and other trace minerals were available at all times. Heifers were kept separate from the remainder of the herd. The cattle (~250 head) were maintained in temporary 4–20 hectare (10–50 acre) lots, bordered by movable electric fences, within the pasture, and moved when grass in the lot was heavily grazed.

Post-mortem examination of the calf's fresh carcass revealed it was female and that the hair epilated easily and patches of skin were missing. The most extensive involvement was over the extremities, particularly the metacarpal, metatarsal, fetlock, and pastern regions (**Fig. 1**). Skin of the submandibular region, ears, neck, and trunk was affected to a lesser degree. The dewclaws were partially or totally devoid of hoof. Several irregular roughened-to-papilliferous areas measuring up to 2-cm wide were present near the coronary bands (*i.e.*, junction of skin and horn of hoof) and at the base of the dewclaws. Several patches of skin on the muzzle were devoid of pigment and the skin surrounding the muzzle contained an approximately 2-cm wide irregular ulcer from which the surrounding skin

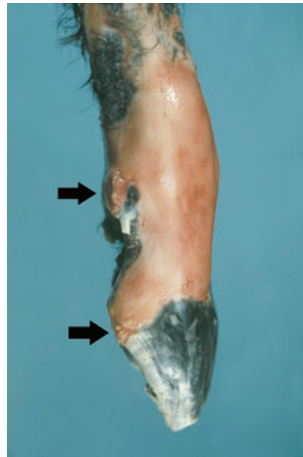


FIGURE 1 | Photograph of a foreleg of a newborn calf from a Black Angus heifer. A large patch of skin is missing. The hoof is missing from the dewclaw and the underlying bone is exposed. Arrows point toward small pink verrucous masses of tissue.

was easily removed. Two areas of mucosa were missing from the hard palate; the largest area measured 2.5cm × 2cm. Four incisor teeth were erupted. The length of the incisors varied greatly; three incisors were soft, pink, and lacked enamel, while the fourth incisor was partially covered with enamel. The upper right cheek teeth were fused to form a single giant tooth measuring approximately 3cm × 2cm × 2 cm. Numerous interconnecting fissures were present in the dorsal lingual mucosa. The esophagus, forestomachs, abomasum, and intestines were unremarkable. Though the anus was small, it was patent. The clitoris was prominent but the remainder of the reproductive tract appeared normal. There was a mild bilateral hydronephrosis.

Microscopically, the grossly affected areas of skin were devoid of epidermis. The surface of the ulcerated areas was covered with a thin

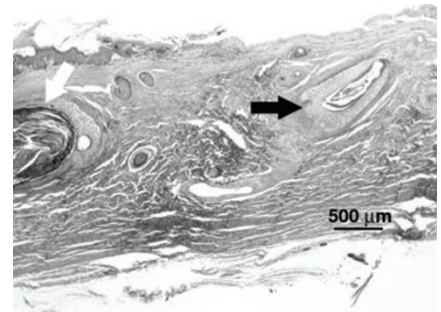


FIGURE 2 | H&E-stained photomicrograph of the skin from the foreleg depicted in Figure 1. A large area of the epidermis has separated from its basement membrane and has sloughed. A white arrow points toward a cystic hair follicle plugged with keratin and a black arrow points toward a large hair follicle. (bar = 500 μm).

layer of eosinophilic material. A few of the hair follicles at the periphery of the ulcerated areas were large, variably dilated and filled with keratin (**Fig. 2**). The papillary masses from the coronary bands of the hooves were composed of neovascularized, fibrovascular connective tissue (granulation tissue). Mucosa of the palate contained a large cleft. At the margins, the cleft was intraepidermal; in the center, separation was at the junction of the lamina propria and basal layer of the mucosa; the basement membrane was intact. Varying degrees of congestion, hemorrhage, and neovascularization were present. Pigmentary incontinence characterized by the presence of melanin-laden macrophages in the superficial dermis was present also.

What is this disorder and how is it transmitted? For what human disease is this disorder an animal model of disease?

What's your diagnosis?

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