



Case Report

Congenital fibropapillomatosis in a pig

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Abstract

This paper reports a case of congenital cutaneous fibropapillomatosis in a piglet from a swine-producing farm in the municipality of Concórdia, Santa Catarina - Brazil. The main gross lesion was an exophytic mass with a light pink color, irregular surface, and margins, sometimes with a cerebrum-like appearance, extending from the right cervical and scapular regions to the craniomedial portion of the right forelimb. Histologically, the mass consisted of a well-delimited proliferation of fibrous tissue in the superficial dermis, covered by a proliferation of keratinocytes with low cellular atypia. Diffuse and severe hyperkeratosis of the epidermis was also observed. Immunohistochemistry for papillomavirus was negative, indicating that this animal had spontaneous non-viral papillomatosis. This condition is rare in pigs, with only two other cases described in the literature.

Keywords: congenital lesions, histopathology, immunohistochemistry, papillomavirus, swine skin diseases.

Introduction

Papillomatosis is a benign skin neoplasm frequently caused by a non-enveloped, epitheliotropic, double-stranded DNA virus (8). Papillomas occur in all animal species and are also popularly known as warts or figs (1). Lesions may have an exophytic or endophytic growth, with a microscopic presentation characterized by papillary projections of the epidermis, hyperplasia of the basal layer, acanthosis, and orthokeratotic hyperkeratosis (1, 4, 7). Fibropapillomatosis is one of the histological variations of the papilloma, with marked dermal proliferation of fibroblasts (7). This neoplasia is linked to the animal's immune status, and the low immunity and confinement-rearing system increases its occurrence (1, 7).

According to the International Committee on Viral Taxonomy (ICTV), the phylogenetic tree of human and animal

papillomaviruses comprises five supergroups classified into A, B, C, D, and E (12). Supergroup C includes the papillomaviruses of ungulate animals composed of bovine (BPV), sheep (OPV), elephant (EPV), and deer (DPV) papillomaviruses (6).

Spontaneous papillomatosis not associated with a viral infection can occur in several species, with few reports in the veterinary literature (9, 14). In Brazil, there are still no reports regarding this condition. This paper reports a case of congenital fibropapillomatosis in a newborn pig in Brazil.

Case description

A three-day-old female piglet from a piglet-producing farm in the municipality of Concórdia, SC, Brazil, was sent for necropsy at the Veterinary Pathology Laboratory



Figure 1. Fibropapillomatosis in a 3-day-old piglet. Proliferative and exophytic light pink lesion on the skin of the neck and scapular region of right forelimb.

of the Instituto Federal Catarinense, Concórdia, SC, Brazil. The owner observed an extensive, irregular, and elevated skin mass in only one piglet from a litter. No other clinical changes were reported, no treatment was instituted, and the farmer opted for euthanasia.

At necropsy, the skin displayed an exophytic mass of light pink color, extending from the right cervical and scapular regions to the craniomedial portion of the right forelimb, measuring 21 x 9 cm in length and 1 cm in height. The lesion had irregular surface and margins, sometimes with a cerebrum-like aspect (Fig. 1).

Tissue fragments of skin lesions and abdominal and thoracic organs were collected and fixed in 10% formalin solution for histopathological and immunohistochemical analyses. All tissues were processed routinely for histopathology and stained with hematoxylin and eosin (H&E).

Aiming to verify the presence of viral protein in the lesions, immunohistochemistry (IHC) was performed using the indirect polymer method. Briefly, skin sections were transferred to positively charged slides, and the samples were deparaffinized, hydrated, and incubated for 15 min with 3% hydrogen peroxide solution diluted in distilled water. Antigen

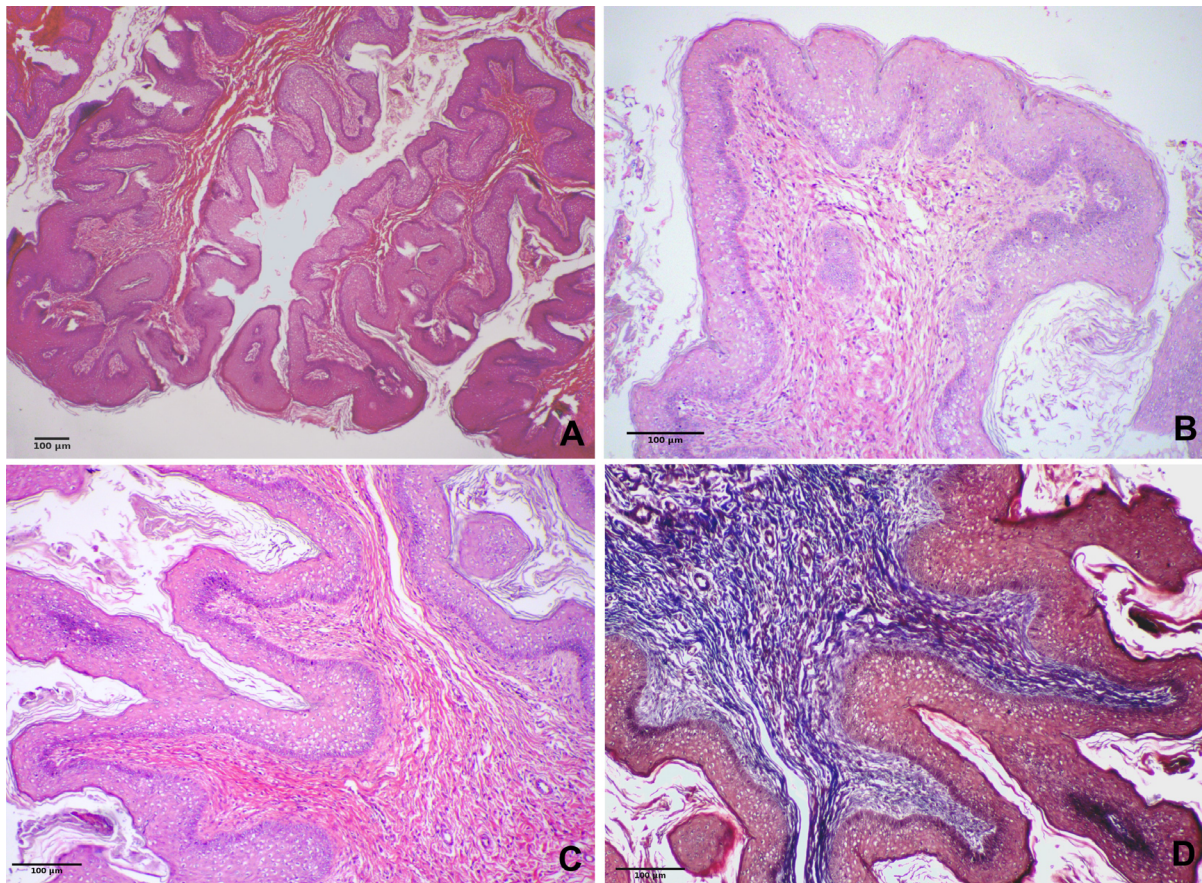


Figure 2. Microscopy of congenital fibropapilloma in a piglet. A- Papillary exophytic growth of the epidermis associated with bundles of fibrovascular tissue. HE, obj. 40x. B- Diffuse moderate acanthosis and hyperkeratosis of the epidermis. HE, obj. 100x, bar = 100 µm. C- Exophytic epidermal neoplasia with moderate proliferation of fibrovascular tissue in the dermis. HE, obj. 100x, bar = 100 µm. D- Evident fibrovascular proliferation of the neoplasia. Masson Trichome, obj. 100x, bar = 100 µm.

retrieval was performed with heat and citrate buffer (pH 6.0), using a water bath at 96°C for 40 min. Skimmed milk powder at 5% in TBS (Tris 20 mM; NaCl 150 mM, pH 7.0) was used as a blocking solution for 20 min at room temperature to avoid nonspecific reactions. Between all incubations, slides were washed with TBS solution. Then, the samples were incubated with anti-bovine papillomavirus 1 (BPV-1, Dako A/S, Glostrup, Denmark) primary monoclonal antibody at a 1:100 dilution for 45 min at 37°C. This antibody has cross-reactivity with the L1 capsid protein of most known papillomaviruses in neoplastic epithelial cells that express the viral antigen and normal infected cells. Next, an anti-rabbit IgG universal polymer kit (MACH 4™, Biocare Medical, Concord, CA, USA) was used, following the manufacturer's instructions. The immunostaining was revealed with AEC, and the slides were counterstained with Mayer's hematoxylin and mounted in an aqueous medium. A paraffin-embedded tissue sample from a previously tested canine cutaneous papilloma was used as a positive control for IHC.

Microscopic examination of the skin tissue showed an exophytic proliferation composed of fibrovascular ramifications covered by a 5 to 10-cell layer of well-differentiated, stratified squamous epithelium. There was also moderate acanthosis and severe diffuse orthokeratotic hyperkeratosis of the epidermis (Fig. 2).

The keratinocytes measured between 20 and 30 µm had fine chromatin, evident nucleolus, and an abundant lightly eosinophilic cytoplasm. Low cellular atypia and approximately four mitotic figures per high-power field were observed (400x). No other lesion was observed in this piglet. All skin samples were negative for papillomavirus in the IHC (Fig. 3).

Discussion

The case reported here is from a piglet born with congenital non-viral spontaneous fibropapillomatosis.

Papillomavirus infection was excluded as a cause of the condition due to the negative result on immunohistochemistry (IHC) and by epidemiological aspects since the other pigs in the litter and whole farm did not show any symptoms. Fibropapillomatosis in pigs is considered a rare condition, with only two cases in the literature (9, 14). One is a report of a newborn piglet with a skin lesion similar to a cauliflower in the head and neck (14). The pig was the only one to present lesions in a litter of nine piglets. The lesion grew rapidly, and euthanasia was chosen at 42 days of age. Microscopically, the lesion consisted of exophytic projections, with fibrovascular ramifications with stratified squamous epithelium (14), very similar to the one described in the present study.

There is another report in Japan of congenital fibropapillomatosis in a pig necropsied at four months of age (9). In that case, the lesion was more extensive, covering the skin from the head to the sacral vertebrae, described as a cauliflower-like, yellowish-white tumor. Skin samples were collected for IHC and PCR for papillomavirus; however, both techniques resulted in negative results (9).

As a differential diagnosis for papillomas, it is important to rule out cutaneous hamartomas (7). Hamartomas are non-neoplastic tumors characterized by uncircumscribed overgrowth of mature tissue in their normal anatomical site and can be congenital or acquired (10, 11). Despite the macroscopic similarity between hamartomas and fibropapillomas, histopathology can make the distinction by observing the histological component and the non-neoplastic proliferation in hamartomas (9, 10, 13). Although hamartomas are much more common in humans (11) and dogs (3, 5), with several stages and histopathological differentiations, they were reported in swine. Previous reports of fibroepithelial (10) and an epitrichial sweat gland (2) hamartomas in piglets describe them as cauliflower-like masses in the head (10) or head, neck, and shoulder (2). Therefore, congenital cutaneous hamartoma can be grossly similar to the fibropapilloma described in this study.

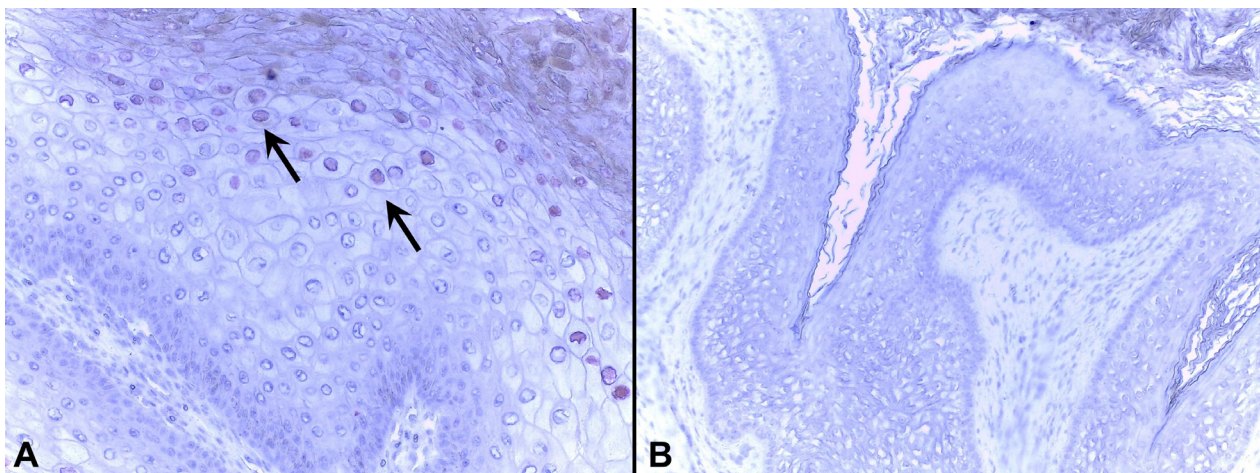


Figure 3. Immunohistochemistry anti-papillomavirus. A- Positive control with intranuclear immunostaining of keratinocytes (arrow). AEC, obj. 200x. B- Absence of immunostaining in the piglet skin sample. AEC, obj. 100x.

Based on gross, histopathological, and immunohistochemical analyses, it can be stated that this piglet had a congenital and non-viral cutaneous fibropapillomatosis. The present report is the third description of this condition in swine in the literature.

Conflict of Interest

The authors declare no competing interests.

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