Pemphigus Foliaceus withTypical Histogramal and Immunohistological Findingsin a Dog

Kyoko SHINYA, Kohji NOMURA, Syouji WADA, Hiroshi MORIOKA, and Takashi UMEMURA
Marupi Lifetech Co., Ltd., 103 Fushio-cho, Ikeda-shi, Osaka 563, "Morioka Animal Hospital, 3–2 Sakuracho, Higashi Osaka-shi, Osaka 579, and Department of Veterinary Pathology, Faculty of Agriculture, Tottori University, Koyama-cho, Tottori 680, Japan
(Received 14 February 1996/ Accepted 15 April 1996)

ABSTRACT. A seven-year-old female mongrel dog showed incurable skin lesions for about a year. The lesions were at nasal bridge and periorcular area, and were composed of crust formation and scaling. Biopsy specimens from the skin lesions possessed with multiple intraepidermal pustules containing many acantholytic keratinocytes. Direct immunoperoxidase stain using paraffin-embedded section showed IgG depositon at the intercellular area of upper epidermis and follicular infundibula. IgG was not detected at basement membrane zone. Clinical and pathological findings of the present case were identical to those of pemphigus foliaceus, an uncommon pustular autoimmune skin disease. — KEY WORDS: canine, direct immunohistological examination, pemphigus foliaceus.


The pemphigus complex is well known, uncommon autoimmune skin disease characterized by intraepidermal vesicle or pustule formation. Routine histological examination of skin biopsy is one of the most supportive for the diagnosis of the disease [3, 10]. Direct or indirect immunohistological examination, direct smears from intact vesicles or pustules are useful and important for the diagnosis of human patients [6]. In dogs and cats, however, detection of pemphigus antibody by immunohistology is not competent for routine examination, because of necessity of special fixation and low detection rate of serum autoantibody [8–10]. Moreover, detection of intact vesicle or pustule is very difficult in dogs and cats. Availability of routine paraffin embedded section for detection of autoantibody have been reported by several authors [1, 2, 5, 7, 11], and 40 to 50% of random biopsy from the cases of pemphigus foliaceus were positive for immunoglobulin [3]. We here describe the routine histopathological and immunohistological findings of a dog affected with pemphigus foliaceus. Scarcity of the literature concerning well-defined case of the disease in Japan prompted the present report.

A seven-year-old female mongrel dog showed incurable skin lesions on her face for about a year. The lesions consist of severe scaling and crust formation, and were confined to nasal bridge and periorcular area. Conventional therapy using antibiotic and steroids did not improve the clinical signs. Biopsy specimens were taken from those areas for histological examination after a restraint of steroid therapy for 3 weeks. Each specimen was soaked in 10% formalin, embedded in paraffin, sectioned at 5 μm, and stained with hematoxylin and eosin. For immunohistological staining, the sections were deparaffinized and washed in water, and were treated with 3% H2O2 for 5 min to block endogenous peroxidase. After 2-times rinse in distilled water, the sections were incubated with 4% pepsin solution (DAKO, Denmark) for 20 min at room temperature. Following 2-times rinse in distilled water, the sections were processed for routine immunohistological staining using labelled streptavidin biotin (LSAB) method (DAKO, Denmark). To investigate the specificity of intraepidermal deposition of IgG for pemphigus foliaceus, skin samples from eyelid and nose (mucosal-epidermal junction), and tongue (moist squamous epithelium), collected from three normal dogs were processed for the direct immunoperoxidase stain described above. The primary antibody was rabbit anti-dog IgG F(ab') antibody (Rockland Inc., U.S.A.). The sections of the lymph node containing plasma cells were used as positive controls. The primary antibody was preincubated with dog IgG (Organon Teknika Co., U.S.A.) for negative controls.

Histologically, the epidermis of affected area thickened severely due to swelling of keratinocytes, spongiosis, and diffuse parakeratosis. Subcorneal pustules were scattered in the epidermis (Fig. 1). The pustules contained many acantholytic keratinocytes, histiocyte mononuclear cells, eosinophils, and neutrophils. The pustules were also present at follicular infundibula (Fig. 2). Lymphocyte, neutrophil, and eosinophilic exocytosis were focally prominent. A few apoptotic keratinocytes were in the spinous layer. The dermis was possessed with superficial perivascular infiltration of lymphocytes, plasma cells, eosinophils, and some neutrophils. In the deep dermis, inflammatory change was minimal, and anagen follicles and activated apocrine glands were scattered.

By immunohistological staining, IgG was positive at intercellular space of upper epidermis and follicular infundibula (Fig. 3). In the positive areas, intense, granular deposition of chromogen was present in intercellular spaces. Preincubation of the primary antibody with dog IgG resulted in total loss of the intense positive reaction. No positive reaction was observed at basement membrane. Immunohistological staining using control antisera resulted in negative. Immunohistology on epithelia of the normal eyelid, nasal plane and tongue showed intercellular depositions of IgG. The deposition was confined to supra basilar area (Fig. 4).

Significant histopathologic findings in skin lesions of the dog were intraepidermal pustules with acantholysis and intercellular deposition of IgG, and the findings
corresponded to those of pemphigus foliaceus [3, 6, 10]. Micropustule formation at follicular infundibula is also one of characteristic lesion of pemphigus foliaceus [4, 10]. Although chronic inflammatory skin lesion proved to have possibility of false positive immune reaction, this distribution was different from that of pemphigus foliaceus [2]. In the present case, deposition of IgG was widespread and at upper epidermis.

In this study, we detected intercellular deposition of IgG in the epithelia of eyelid, nasal plane and tongue of normal dogs. The deposition in normal dogs was present in supra basilar area of the epidermis and was distinctive from that of pemphigus foliaceus, in which IgG was demonstrated in upper epidermis. The supra basilar deposition of IgG in the squamous epithelia of normal dogs should be noted, since the finding is one of the characteristics of pemphigus vulgaris [1, 3-6, 10, 11].

REFERENCES


