Squamous Cell Carcinoma in a Canadian Lynx (Lynx canadensis)

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Abstract. A case of squamous cell carcinoma originating from the left cervical region in a 14-year-old male Canadian lynx (Lynx canadensis) was studied. At necropsy, a marked fibrous thickening with ulcers in the skin of the left cervical region, as well as subcutaneous irregular yellowish-white mass involving left parotid and latter part of the mandible was observed. Microscopically, the masses consisted of infiltrative growth of a well-differentiated squamous cell carcinoma with prominent fibrous reaction. The tumor showed wide and deep invasions, particularly around the trachea. The tumor cells were positive for keratin, cytokeratin AE1 and AE3. The morphological features of the tumor closely resembled to those in cats.

Key Words: Squamous cell carcinoma, Lynx Canadensis, histopathology, Immunohistochemistry

Squamous cell carcinoma is one of common malignant tumors in the integumentary system and oral cavity in dogs [1,2], cats [1,2,4] and horses [1]. However, there have been very few reports in wildlife including wild felidae [5]. Only two case of oral squamous cell carcinoma were reported in Canadian lynxes (Lynx canadensis) [6,7]. We describe a necropsy case of squamous cell carcinoma occurred in the skin of a Canadian lynx.

A 14-year-old male Canadian lynx (Lynx canadensis) was submitted because of a head tilt and bloody discharge from left ear. The animal was purchased as an adult from a commercial supplier and, maintained with a female for display purpose. On admission, a diffuse dermatitis with marked thickening, as well as palpable subcutaneous masses was observed in the left parotid region. A surgical operation to remove the mass including salivary gland was performed. The removed mass was sent to Gifu University, Department of Veterinary Pathology for histological diagnosis. The diagnosis was squamous cell carcinoma with metastasis to the regional lymph nodes. The head tilt disappeared temporarily after two operations but head tilt and parotid swelling
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were reappeared. Eight weeks after admission, the condition of the animal worsened. The animal died in a coma 11 weeks after admission.

Necropsy was performed immediately after death by veterinary staffs. Organs and tissues were collected and fixed in 10% neutral buffered formalin and sent to Gifu University for histopathologic diagnosis. The tissues were then embedded in paraffin, cut in 5 μ sections, and stained with hematoxylin and eosin (HE). Deparaffinized sections of the tumor were prepared for immunohistochemistry by the labeled streptavidin-biotin (LSAB) method (Dako Corp., Santa Barbara, CA, USA). The primary antibodies were keratin (polyclonal, Dako Corp., Santa Barbara, CA, USA), and AE1 and 3 (monoclonal, Dako Corp., Santa Barbara, CA, USA). The specimens were counterstained with Mayer's hematoxylin.

At necropsy, the cadaver was a rather poorly nourished one, and his hair coat was rough and thin, with marked alopecia in the parotid region. There was a small amount of coagulated blood on the skin with a few small irregular ulcerations in the parotid region. The body weight at necropsy was 15 kg. The face was asymmetrical because of marked swelling of left cervical region. After removing skin, irregular-shaped, yellowish-white tumor masses involving the left parotid and mandibular regions, latter mandible and upper trachea were observed (Fig. 1). The cut surface of the tumor masses was moderately firm, yellowish-white, with conspicuous infiltration of the subcutis and muscle, and around the trachea.

Histologically, all of the masses consisted of infiltrative growth of well-differentiated squamous cell carcinoma with prominent stromal fibrosis. Numerous irregular cell cords of epidermal cells were infiltrating downward the subcutis and muscle, and reached to the trachea (Fig 2). There were prominent infiltrations of the tumors in and around the parotid. The neoplastic cells had round to ovoid large nuclei with prominent nucleoli, and abundant acidophilic cytoplasm with glassy appearance (Fig 3). The size of nuclei varied considerably.

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Fig. 1 Irregular tumor mass invading into left parotid and mandibular regions.

Fig. 2 Squamous cell carcinoma. Irregular tumor cell cords infiltration into the dermis. There is a marked degree of fibrous reaction around the tumor. HE. 60×.

The tumor cell cords frequently had islands of keratin, some of which had an appearance of so-called “Horn pearl”. There were intercellular bridges among tumor
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Fig. 3 A large magnification of tumor cell cord. Prominent proliferation of epidermal cells with a central keratinization (arrow). HE. ×300.

Fig. 4 Immunohistochemical stain for cytokeratin AE 1 and 3. Labeled streptavidin–biotin (LSAB) method. ×300.

cells. Mitotic figures were rather frequent. Metastatic deposits of squamous cell carcinoma were present in the left cervical lymph nodes.

Immunohistochemically, a positive reaction for keratin and cytokeratin AE 1 and AE 3 were found in the cytoplasm of tumor cells (Fig 4).

In other organs, a severe degree of meningitis was observed in the whole brain. The lungs showed a severe degree of pulmonary edema as well as marked congestion.

Based on gross and histological findings, the present case was classified as well-differentiated squamous cell carcinoma derived from the skin of the cervical region. Prominent stromal fibrous reactions were frequent findings in squamous cell carcinomas in dogs and cats [1-4]. Immunohistochemistry for keratin and cytokeratin AE 1 and 3 showed a strong evidence of squamous cell origin in the present tumor [9].

As for the original site of occurrence of the present tumor, the skin of parotid region was most probable because of prominent invasions with ulcerations. Squamous cell carcinoma of the skin in cats is invariably found on the head region, usually involving the pinna, the nasal planum, external nares, lips, or eyelids [2]. Squamous cell carcinoma may also be encountered rarely in the esophagus of cats, where they develop in the midthoracic portion, forming proliferative plaques of tumor cells, which eventually ulcerate and invade the wall of the esophagus and adjacent mediastinum [8]. Although the present case had marked invasion around the trachea and the mandible, the tumor might extend from the skin of parotid region where the most prominent tumor growth was observed. In general, squamous cell carcinomas are locally invasive but slow to metastasize [1,2]. When metastasis does occur it is usually to the regional lymph nodes first and then to the lung. The present case had metastatic deposits in the regional lymph nodes but no metastasis was seen in other organs including the lungs. Severe local invasion in the neck region might cause death in this animal. There was no
apparent correlation among meningitis, pulmonary edema and cervical tumor.

In humans, the prevalence of squamous cell carcinoma closely parallels the yearly hours and intensity of ultraviolet irradiation and sunbathing habit of the population [10]. The same was proven in some animals [11,12]. It was uncertain in the present case if there was an obvious progression from solar keratosis to carcinoma.

The present tumor seems to be closely similar to those of domestic cats in morphology as well as prognosis.

要約

14歳の雄カナダオオヤマネコの左顎部皮膚に発生した扁平上皮癌の病理学的特徴を調べた。剖検では、左顎部皮膚は潰瘍を伴い著しく肥厚し、皮下には形状が不規則な黄白色腫瘤が左耳下腺部および左下頬に認められた。組織学的には、腫瘍は分化型扁平上皮癌の浸潤増殖となり、高度な線維化を伴っていた。この癌は広範囲で深い浸潤を示し気管周囲にまで到達していた。

免疫組織学的には、腫瘍組織の細胞質ケラチンおよびサイトケラチン AE1およびAE3に対する陽性反応が認められた。本腫瘍の形態学的特徴はネコのそれとよく類似していた。

キーワード：扁平上皮癌、カナダオオヤマネコ、組織学、免疫組織学

REFERENCES