

## Tonsillar squamous cell carcinoma in a male Lhasa Apso

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### Abstract

Squamous cell carcinoma (SCC) and more specifically tonsillar SCC are generally regarded as locally invasive with various rates of metastasis. A 13-year-old male Lhasa Apso was referred to the clinic with an unusual mass on his left tonsil and abnormal lumps under the tongue. The dog's food and water intake, breathing and heart rates, body temperature, capillary refill time, and blood tests were normal. A biopsy of abnormal tissue and immunohistochemical analysis were performed. Histopathological and immunohistochemical evaluations confirmed the basaloid SCC. Some treatments like surgery, radiotherapy, and chemotherapy are used to treat a specific tumor or area of the body. However, in this particular case, chemotherapy was not administered. Considering that dogs with tonsillar cancer generally have a poor to guarded prognosis and a short life expectancy, this case was euthanized after one year with the owner's consent due to the significant tumor enlargement.

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### Introduction

The prevalence of cancer in animals, particularly in domesticated pets like dogs, is an increasing concern in veterinary medicine. The incidence of squamous cell carcinoma (SCC) in dogs, and more specifically tonsillar SCC (TSCC), remains relatively uncommon.<sup>1</sup> The SCC is a cancerous tumor originating from the squamous cells lining the mucosal surfaces of different body structures. Although SCC is well-studied in humans, our understanding of SCC in animals, particularly in dogs, is limited. The TSCC poses unique challenges due to its location and low prevalence. Compared to other neoplastic diseases commonly observed in veterinary practice, such as lymphoma or mammary tumors, research on TSCC has been limited. The SCC can impact different areas of the body, such as fingers, lips, eyes, skin, lungs, anus, abdomen, ears, mammary gland, and oral and nasal cavities.<sup>2,3</sup> The SCC can be classified into two stages. Carcinoma *in situ*, also known as Bowen's disease, serves as a transitional phase from actinic keratosis to invasive SCC, being commonly known as a standard SCC.<sup>4</sup>

During this process, the atypical keratinocytes exhibit characteristics such as apoptosis, hyperchromasia, nuclear pleomorphism, and loss of polarity.<sup>5</sup> Basaloid SCC (BSCC)

is a kind of SCC that is more aggressive and mostly has a predilection site for the oral cavity; but, may spread to distant organs as well. The BSCC is the rarest variant of squamous cancer with a frequency occurrence of almost 1.00% of all SCC in dogs. It was first described by Wain in 1986 as a separate histopathological entity. Histologically, BSCC cells have two distinct forms, with a characteristic basal cell component associated with the squamous component. The basaloid cells display an increased nuclear/cytoplasmic ratio, scant amphophilic cytoplasm, and oval and hyperchromatic nuclei without prominent nucleoli. Mitotic figures and nuclear pleomorphism frequently occur in all cases. The basaloid components can be seen in cords, nests, islands, and lobules. Although it is less aggressive than the same condition in humans and does not usually spread, it is crucial to diagnose it early and remove it through surgery for a good outcome.<sup>6,7</sup> The SCC is commonly characterized as a carcinoma invading the surrounding tissue locally and has a relatively low tendency for slow metastasis. However, the potential for metastasis can vary depending on the tumor's location.<sup>8</sup> Originating from Tibet, the Lhasa Apso breed is renowned for its unique traits and vulnerability to certain health conditions. Despite the generally long lifespan, Lhasa Apso, like other purebred dogs, faces an elevated likelihood of

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inheriting diseases, including specific forms of cancer. Predispositions to these conditions arise from a combination of genetic factors, environmental influences, and lifestyle. In line with that, it is imperative to thoroughly investigate and document instances of neoplasia in Lhasa Apso as these aids in comprehending the root causes and developing suitable diagnostic and treatment strategies.

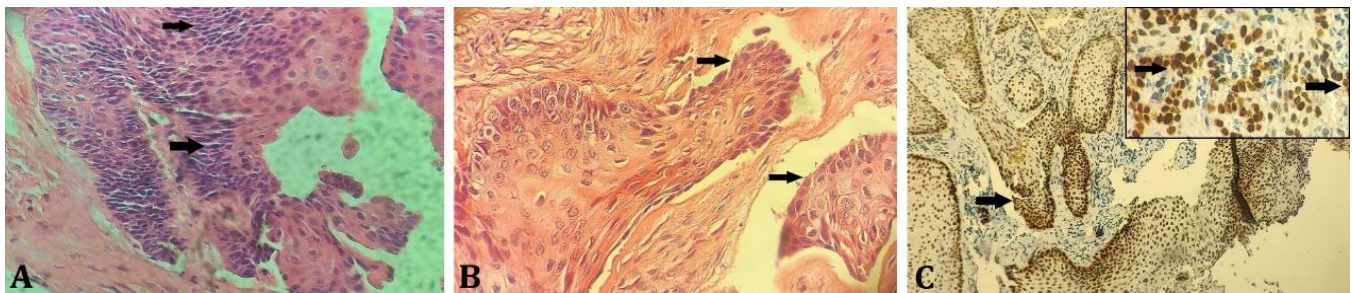
### Case Description

A 13-year-old male Lhasa Apso was referred to the clinic with an unusual mass on his left tonsil and abnormal lumps under the tongue. The gross section of the excised specimen revealed an ulcerative reddish mass with punctate hemorrhage and some pale areas, with nodules measuring 0.50 × 1.00 cm. The dog's appetite, food and water intake, breathing and heart rates, capillary refill time, body temperature, and blood tests were all within normal ranges. The presence of an abnormal mass located on the left tonsil and the emergence of abnormal lumps under the tongue have led to suspicions of neoplasia, particularly SCC. Radiological imaging of the case's head, biopsy of the abnormal mass in the left tonsil, histopathological examination, and immunohistochemical analysis were conducted. The results of radiological imaging of the head were normal, with no evidence of any abnormalities. The histopathological examination and immunohistochemical analysis confirmed the presence of BSCC. As shown in Figure 1, the histopathological examination of the abnormal mass found in the left tonsil of the dog revealed tumor cells arranged in a lobular pattern. The basaloid cell population exhibited an oval and spindle shape, with limited cytoplasm and hyperchromatic nuclei. The surface tumor cells formed solid epithelial nests, indicating a diagnosis of BSCC. Also, as shown in Figure 1, the immunohistochemical staining of the abnormal mass located in the left tonsil of the dog showed a high expression of the tumor protein 63 in the tumor cells, further supporting the diagnosis. Chemotherapy was not conducted for this particular case.

Ultimately, after one year, when the tumor had significantly grown, the decision was made to euthanize the dog in question with the owner's consent.

### Discussion

The TSCC in dogs is a challenging clinical issue. Despite its infrequent occurrence, it is a significant concern due to its aggressive behavior, limited therapeutic options, and uncertain prognosis. The situation is further exacerbated by the lack of comprehensive data on treatment results. Early detection provides a ray of hope; dogs with TSCC confined to a single tonsil and without metastasis have a considerably longer median survival time (637.50 days) than those with advanced or bilateral disease. Moreover, a combined strategy involving surgery and supplementary chemotherapy can potentially extend the median survival time to 464.50 days.<sup>9</sup> These observations highlight the importance of early diagnosis and holistic treatment plans in reducing the adverse impacts of TSCC. The TSCC has a worrying tendency to metastasize, primarily to lymph nodes and lungs. Interestingly, the opposite scenario, metastasis from other primary tumors to the tonsils, seems to be rare in dogs.<sup>10</sup> The use of multi-modal therapy for canine TSCC, including surgery, radiation and chemotherapy, has demonstrated the potential to enhance survival rates, notwithstanding the possible bias in current studies. A retrospective study conducted by Murphy *et al.* on five TSCC cases treated with this method reported a promising median survival of 211 days, with two dogs living beyond two years without disease. The fact that the treatment was well-tolerated further supports this approach. To validate its effectiveness and address any bias, it is essential to conduct larger, controlled trials.<sup>11</sup> Despite the existence of various treatment methods such as surgery, chemotherapy and radiation therapy, a universally effective treatment is yet to be found.<sup>1</sup> A deeper understanding of the underlying biological processes could lead to the creation of targeted therapies, offering a better chance for successful treatment. Furthermore, the pursuit of personalized medicine



**Fig. 1. A)** The histopathological examination of the abnormal mass found in the left tonsil of the dog revealed that the basaloid cell population (arrows) exhibited an oval and spindle shape, with limited cytoplasm and hyperchromatic nuclei (Hematoxylin and Eosin staining; 400×). **B)** The tumor cells were arranged in a lobular pattern (arrows), and the surface tumor cells formed solid epithelial nests (Hematoxylin and Eosin staining; 400×). **C)** Arrows indicate high expression of the tumor protein 63 in the tumor cells using immunohistochemical staining (100×; inset 400×).

strategies tailored to each canine patient could enhance treatment effectiveness and improve the quality of life for affected animals. The complexities of TSCC pose a significant challenge; but the ongoing research efforts provide a beacon of hope for improved outcomes. By deciphering the biological mysteries of this cancer and developing more effective treatment strategies, we can aim for a more promising future for dogs diagnosed with this formidable disease.

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### Conflict of interest

The authors declare no conflict of interest.

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