



## A Comprehensive Study on Glomus Cell Tumours on Animals

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### DESCRIPTION

The glomus body is a special form of arteriovenous anastomosis regulated by the sympathetic nervous system, whose function is primarily thermoregulation. Basically, this structure consists of afferent arterial segments, efferent venules, and anastomotic vessels that connect the arterial and venous capillary circulation, the so called Suquet-Hoyer canal. The types of cells that make up the walls of the Suquet-Hoyer canal are called glomus cells and are classified as modified smooth muscle cells. Tumors resulting from this cell type can have different phenotypes such as glomus cells, smooth muscle cells, or blood vessels and are subtyped into glomus cell tumors, glomangioma and glomangiomioma based on this morphological differentiation. Although glomus cell tumors are rare in animals, these neoplasms are non-human primates, horses, cows, dogs, and cats usually as a single benign growth or rarely multiple masses. Most glomus cell tumors reported in animals have been described elsewhere, such as the carpal bone, forearm, ischial tuberosity, genital and abdominal organs, but most commonly the distal end of the finger. In humans, this type of neoplastic structure is described in the subungual region like finger and toe pads, as well as in the ears, hands, and other parts of the body that develop in the deep dermis and subcutaneous tissue. This report shares the same histopathological and immunohistochemical characteristics as the glomus cell tumors previously described in small animals, but describes skin neoplasms in unique locations and is described in cats.

Glomus cell tumors are rare in small animals and have only been reported in 8 cases since 1960. This neoplasm arises from the sustentacular cells of the glomus body, a particular form of peripheral arteriovenous shunt with localized thermoregulatory function. In humans, the subungual region appears to be the most common region where glomus cell tumors are found, but elsewhere have been reported. This type of tumor has only been reported once in cats where the tumor is confined to the fingers.

The morphological features of this case, such as the specific vascular pattern and string arrangement of neoplastic cells, are similar to current cases and strongly diagnose glomus cell tumors as described in human cases. In this study the diagnosis of glomus cell tumors was based on the individual nature of the tumor, the morphology of neoplastic cells associated with blood vessels, the peritumor nerve fibers, and the supporting immunohistochemical staining pattern. Glomus cell tumors are usually immunopositive for vimentin, SMA, muscle actin, and immunonegative or locally immunopositive for desmin. With respect to immunohistochemical findings, cytokeratin negative ruled out similarities in cord-like appearance to some appendageal tumors such as basal cell tumors or trichoblastomas. Vimentin, considered a common non-epithelial mesenchymal marker, was immunopositive and consistent with the results reported for glomus cell tumors. In addition, high positives for muscle actin and SMA confirmed the origin of the mass of study from smooth muscle cells. All neoplastic cells are negative for von Willebrand factor, desmin (muscle marker), and vascular endothelial tumor (hemangioma), melanocyte neoplasm or the importance of immunopositive NSE is unknown. This marker has usually been reported negative in human glomus cell tumors (although it does not appear to be routinely used in all cases) and was negative in previously reported cats. However, it is not a particularly specific marker, because immunopositive muscle actin and SMA essentially ruled out Merkel Cell Tumors (neuroendocrine tumors), additional more specific markers for neuroendocrine lines including chromogranin and synaptophysin. Human glomus tumors show positive vimentin labeling for mesenchymal cells and SMA, a pattern that has been observed in all previously reported veterinary cases. Desmin's immune response varies, but positives for this marker have been reported in some human cases. The absence of local recurrence or local lymphadenopathy was consistent with the benign biological behavior of the tumor, as previously reported in dogs, cats, and humans.

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