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Is any association between physiological and neoplastic angiogenesis in corpus luteum and mammary gland tumors in bitches? – preliminary study

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Mammary tumors are the second most common neoplasms in bitches1. Mean age when mammary gland tumors occur is 10.1 years2. In some of these cases, the use of non-surgical treatment is required. There are a large numbers of different protocols of radio- and chemotherapy, however, they are not always sufficient. Angiogenesis inhibition seems to be very interesting way to suppress tumor growth. On the other hand development of repeatedly occurring corpus luteum (CL) is related to the phenomenon of controlled, physiological angiogenesis. Intense capillaries growth and regression during post-ovulatory luteinization and following luteolysis, still undergo many studies, but there is no final conclusion about its regulation. Knowledge about angiogenesis regulation mechanism in genital organs is crucial to improve neoplasm treatment methods. There are no studies on the relationship between angiogenesis in CL and mammary gland in bitches. The aim of our investigation was to compare physiological and neoplastic angiogenesis in corpus luteum and mammary gland tumors in bitches, using immunohistochemistry. Ovaries and tumors were collected by mastectomy combined with ovariohysterectomy, performed in bitches (n=5). Formalin-fixed, paraffin-embedded sections was stained by antibodies CD31(PECAM-1) (DAKO, Clone JC70A, M0823, 1:40) specific for endothelium of blood vessels. Stained endothelial cells were examined. Expanse and intensity of protein expression was compared between CL and tumor in each bitch. Hot spots containing the largest density of blood vessels were selected. Each slide was evaluated basing on hot spot areas (n=5), in which number of positive labelled blood vessels were counted at the magnification of 400x. Obtained results allow to conclude that the blood vessels in the corpus luteum are numerous (average 5-7 in a field of view), but scattered, thin-walled, composed of single (2-4) endothelial cells. In the case of mammary neoplasms blood vessels are much larger, more pronounced, composed of a larger number of cells, but their plurality is similar to CL vessels (average 5-7 in the field). These vessels were clustered in groups, both in the stromal tissue and tumor tissue, also inside and around the tumor. This may indicate a significant degree of tumor angiogenesis and its predominance over the physiological angiogenesis. Our investigation was a preliminary test on several specimens. Repetition on larger group and combining with use of other antibodies reacting with blood vessels are required.