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Cell proliferation and differentiation of the canine mammary mixed tumor

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Dog is the most tumor frequent species in the veterinary field. Mammary tumor is one of the most frequent tumor in the dog next to the skin tumor. In the canine mammary tumors, half of them are said to be mixed tumor. Mixed tumor has been paid special attention of the morphologist since long time ago because of its characteristic features, i.e. formation of cartilage and bone in the mammary tumor tissue. However, its morphogenesis has not been completely understood yet. Recent veterinary oncologists regard the canine mixed tumor as a mammary tumor with mucoïd, chondroid or osteoid tissue together with acinar or ductal structures. These tissues are considered to derive from mammary myoepithelial cell. However, why the myoepithelial cell turn into mucoïd or chondroid tissue at the tumor condition and why this event happens only in the condition of canine mammary tumor are quite interesting matters.

In the canine mammary mixed tumor, the cells found in the mucoïd or chondroid tissue show vimentin positive by the immunohistochemistry, compared with actin positive of myoepithelial cells in the duct-acinar structures. Therefore, there seemed to be no reasons to conclude why the cells in these tissues derived from myoepithelial cell. However, electronmicroscopic examination reveals that there is gradual

change of the cytoplasm filamentous components at the time when myoepithelial cell produce mucoïd substance around its surrounding matrix¹⁾. On the other hand, we established a cell line derived from canine mixed tumor. When this cell line inoculated into nude mice, they showed solid carcinoma at the early passage and myxomatous area with duct like structures at the nine passage²⁾.

From above findings, although there are some exceptional variations, there seemed to be concluded that most of the canine mammary mixed tumors are consisted of duct-acinar structures derived from duct-acinar epithelial cells and mucoïd tissue which derived from sole proliferation of myoepithelial cells producing mucoïd into surrounding matrix. The myoepithelial cell in the canine mixed tumor might possess multi-potential ability to differentiate into epithelial cells and mesenchymal cells.

References

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