

Study of the bone produced from canine mesenchymal stem cell differentiation

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ABSTRACT

Background and Aim: The aim of the present study was to isolate mesenchymal stem cells (MSCs) from canine bone marrow, differentiate them into bone and examine the structure of the produced bone that was not reported before.

Materials and Methods: MSCs from canine bone marrow were extracted, expanded and cultured in an osteogenic medium which differentiated into bone tissue on the surface of the cover slips. At the end of the differentiation period, the bone prepared was examined with light and electron microscopes. In this study, the isolated cells were also differentiated into adipocytic cell lineage.

Results: Cultivated mesenchymal stem cells formed several nodule-like structures during differentiation period. According to the light microscopic images, these nodules were composed of several layers of cells with an abundant matrix among the cells. Transmission electron microscopic study indicated that the cells were mainly of spindle-shape morphology similar to osteocytic cells, and the matrix consisted of collagen fibers with sharp striation organized in bundles perpendicular to each other.

Conclusion: It seems that the bone produced from in vitro differentiation of the MSCs, histologically is similar to that of laminar bone particularly in terms of the collagen fiber arrangement.

Key words: Canine Mesenchymal Stem Cells, Bone Differentiation, Bone ultra-structure