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My clinical experiences using autogenic and allogenic bone marrow mesenchymal stem cell (MSCs)

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In our body, cells having self-renewal and multi-differentiation capabilities exist in many tissues and the cells are called adult stem cells. It is well known that one of the stem cells (mesenchymal stem cells; MSCs) reside in bone marrow tissue. Number of the MSCs is very low; however the number increases after *in vitro* culture expansion. The cultured MSCs are currently used for various tissue regenerations in clinical settings. We have started their clinical applications towards bone tissue regeneration since 2001. We have also treated patients having cartilage damage. The MSCs used are derived from patient's bone marrow, thus we use autogenic MSCs for the treatment. The autogenic cells do not induce transplantation immunity and can be used without fear of donor derived infection. However, autogenic MSCs cannot be used for the patients having genetic disorder which cause impairment of the targeted tissue regeneration. For example, for the purpose of bone tissue regeneration, if the patients have mutations of bone tissue-related genes, autogenic cells are hard to be used for treatments of his/her bone fragility. One of the bone-related gene is alkaline phosphatase (ALP), which is necessary for bone tissue development. The patients having the gene mutation of the ALP (Hypophosphasia) cause skeletal abnormalities resulted in short limbs and soft skull bones. Due to impairment of osteoblastic differentiation capability of the patient MSCs, we have used allogenic MSCs for treatments of the patients. This presentation summarizes clinical experiences using autogenic/allogenic MSCs for the purpose of various tissue regenerations.

Biography

Hajime Ohgushi has completed his MD in 1976 and PhD from Nara Med University in 1980. He was a Research Associate in the Department of Biology at Case Western Reserve University USA from 1985 to 1987, Lecturer and Assistant Professor in Department of Orthopedics, Nara Medical University from 1989 to 2000. Currently, he is the Head of the Orthopedics and Deputy Director at Ookuma Hospital. He has more than 200 publications mostly related to tissue engineering/regenerative medicine and total citations are more than 10000.

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