

R-22. The Bone regenerative effects of tetracycline blended chitosan membranes on the calvarial critical size defect in Sprague dawley rats

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The major goals of periodontal therapy are the functional regeneration of periodontal supporting structures already destructed by periodontal disease as well as the reduction of signs and symptoms of progressive periodontal disease. There have been many efforts to develop materials and therapeutic methods to promote periodontal wound healing.

There have been increasing interest on the chitosan made by chitin. Chitosan is a derivative of chitin made by deacetylation of side chains. Chitosan has been widely studied as bone substitution and membrane material in periodontology. Many experiments using chitosan in various animal models have proven its beneficial effects.

Tetracycline has been considered for use in the treatment of chronic periodontal disease and gingivitis.

The aim of this study is to evaluate the osteogenesis of tetracycline blended chitosan membranes on the calvarial critical size defect in Sprague Dawley rats.

An 8mm surgical defect was produced with a trephine bur in the area of the midsagittal suture. The rats were divided into five groups: Untreated control group versus four experimental group. Four types of membranes were made and comparative study was been done. Two types of non-woven membranes were made by immersing non-woven

chitosan into either the tetracycline solution or chitosan–tetracycline solution. Other two types of sponge membranes were fabricated by immersing chitosan sponge into the tetracycline solution, and subsequent freeze–drying. The animals were sacrificed at 2 and 8 weeks after surgical procedure. The specimens were examined by histologic analyses. The results are as follows:

1. Clinically the use of tetracycline blended chitosan membrane showed great healing capacity.
2. The new bone formations of all the experimental group, non–woven and sponge type membranes were greater than those of control group. But, there was no significant difference between the experimental groups.
3. Resorption of chitosan membranes were not shown in any groups at 2 weeks and 8 weeks.

These results suggest that the use of tetracycline blended chitosan membrane on the calvarial defects in rats has significant effect on the regeneration of bone tissue in itself. And it implicate that tetracycline blended chitosan membrane might be useful for guided tissue regeneration.

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