

Evaluation of the Osteoconductive Property of Locally Synthetic Hydroxyapatite from Egg Shell as a Novel Bone Substitute – An Experimental Study in Rat

Fouad Hussain Al-Bayaty, Anissa Lokman, Suhaila Yazid and Omar Emad
Universiti Teknologi MARA (UiTM), Malaysia

Objectives: To evaluate the osteoconductive property and healing of locally synthetic hydroxyapatite from egg shell in extracted tooth socket.

Materials and methods: Toxicity of hydroxyapatite from egg shell was tested on fibroblast and osteoblast cells line. Upper central incisors of thirty six adult male Sprague Dawley rats were extracted. Animals were divided into four groups; sockets of group 1 (control) were left empty, group 2 filled with commercially available hydroxyapatite, group 3 with locally synthetic hydroxyapatite from egg shell, while group 4 with locally synthetic hydroxyapatite from egg shell and growth factor platelet rich plasma . All sockets were sutured with resorbable dental suture. Animals were scarified, two, three and four weeks after the extractions. Serial sections were obtained and stained with hematoxylin and eosin, immunohistochemistry and Masson's Trichom staining. Blood samples were taken before and after experiment for biochemical analysis. All statistical analysis were done using SPSS version 20.

Results: Hydroxyapatite from egg shell showed no toxicity on fibroblasts and osteoblasts. There were no changes in biochemical blood parameters of experimental group compared to control group. Histological examination of haematoxylin and eosin, immunohistochemical and Mason Trichom demonstrated that sockets treated with locally synthetic hydroxyapatite from egg shell and growth factor were completely filled with newly generated bone tissue with a thickness comparable to native bone and were significantly better than the control group. Fibroblast and collagen fibres were more predominant in experimental groups than the control.

Conclusion: Locally synthetic hydroxyapatite from egg shell promoted bone healing by osteoconductive property and increased with combination of growth factor.

Biography:

Fouad Hussain Al-Bayaty Currently, Professor at the Faculty of Dentistry Universiti Teknologi MARA-UiTM. External Examiners for PhD and M.Sc. Postgraduate students, Supervising thesis of 35 PhD and M. Sc. Students in Malaysia and Iraq, published more than 120 research in ISI and non ISI scientific journals and five books, obtained 79 medals (gold, silver and bronze) in the international and national level.