ABSTRACT

OSTEOGENESIS IN TENSION SITE AFTER APPLYING NANOPOWDER GOLD SEA CUCUMBER (STICHOPUS HERMANII) AS ORTHODONTIC RELAPSE PROTECTION

(Experimental Laboratory Study on *Cavia Cobaya*)

Background: Relapse Orthodontic is the return from the final tooth position at the end of treatment to the original teeth position. Relaps can disorganized periodontal tissue, unstable teeth, occlusion, and change orthodontic result. *Stichopus hermanii* have contain various active ingredient such as glycine, collagen, flavonoid, arginine, chondroitin sulphate, that might reduce relapse orthodontic. **Objectives:** The aim of this study is to investigate osteogenesis in tension site after applying nanopowder *Stichopus hermanii* as protection of orthodontic relapse. **Material and Method:** Twenty four males *Cavia cobaya* were divided into three groups. K(-) group as negative control group (without treatment), K(+) group as positive control group which were applied with relaps orthodontic forces which produced by applying elastic separator 14 days and was removed 7 days, and P groups, were applied with relaps orthodontic forces and nanopowder *Stichopus hermanii* 3% and sacrified after 21 days HSP-70, IL-17a, MMP-8, Integrin α2β1, ALP, TRAP-6 expression were examined with immunohistochemistry method, bone apposition using mikrostepper microscope and relaps biometric using caliper. **Results:** The result showed HSP-70, IL-17, MMP-8, TRAP-6 expression was decreased while ALP, integrin α2β1 was increased. Apposition alveolar bone in tension area showed increased. Path analysis correlation showed the relationship causalistic between *Stichopus hermanii* affect ALP, apposition alveolar bone, relapse biometric. The other Path analysis correlation showed IL-17, MMP-8, integrin α2β1, apposition alveolar bone, relapse biometric.The first pathway is dominant. **Conclusion:** Nanopowder *Stichopus hermanii* 3% could effectively be as protection of orthodontic relapse with osteogenesis in tension site through ALP-apposition-relaps pathway and IL-17-MMP-8-integrin-apposition-relaps. The ALP-apposition-relaps is dominant compare with IL-17-MMP-8-integrin-apposition-relaps pathway.

***Keywords**: Stichopus hermanii, osteogenesis, tension site, orthodontic relapse.*