

CHAPTER IV

RESULTS

Ten miniscrew implants (1.6 mm in diameter, 6.0-9.0 mm in length; Renew Biocare Corp., San Bruno, California, USA) were placed in the midpalatal areas of six female and four male patients with mean ages of 19.0 ± 2.62 years (range 15 to 24 years). No patient reported pain or discomfort at the time of sample collection. At placement and during the unloaded period, all miniscrew implants were clinically immobile. During the loaded period, one miniscrew implant was mobile and later removed on day 18. The success rate of miniscrew implants was 90%.

Table 4.1 Age (year) distribution by gender and number of the subjects (n) in each group in the present study.

Gender	n	Minimum	Maximum	Mean	Standard Deviation
Female	6	17.5	24.3	20.2	2.35
Male	4	15.6	22.1	18.4	2.71
Total	10	15.6	24.3	19	2.62

In almost all GCF and PMICF samples collected around experimental molars, control molars and miniscrew implants, the CS (WF6 epitope) could be detected by a competitive ELISA with WF6 monoclonal antibody, and proteins by protein assay. The CS (WF6 epitope) levels in all samples were measured in nanograms per

microgram (ng/ μ g) of total protein content. It should be noted that the data from the failed implant case was not included in the calculated results.

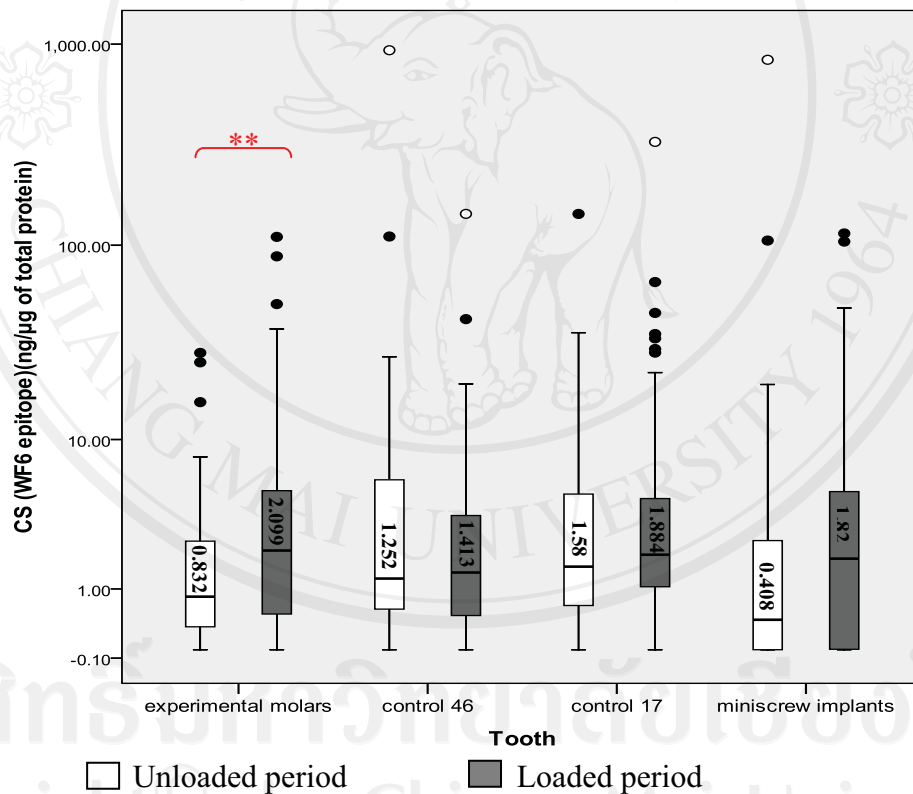
Boxplot graphs of medians of CS (WF6 epitope) levels per total protein in the GCF and PMICF samples of experimental molars, control right mandibular first molars, control right maxillary second molars and miniscrew implants during the unloaded and the loaded periods are shown in Figure 4.1.

During the unloaded period, the CS levels around experimental molars ranged from 0.0 to 28.6 ng/ μ g of total protein and the median of CS (WF6 epitope) levels was 0.832 ng/ μ g of total protein (n = 90). The CS (WF6 epitope) levels around control right mandibular first molars ranged from 0.0 to 932.2 ng/ μ g of total protein and the median of CS (WF6 epitope) levels was 1.252 ng/ μ g of total protein (n = 45). The CS (WF6 epitope) levels around control right maxillary second molars ranged from 0.0 to 143.2 ng/ μ g of total protein and the median of CS (WF6 epitope) levels was 1.58 ng/ μ g of total protein (n = 45). The CS (WF6 epitope) levels around miniscrew implants ranged from 0.0 to 836.0 ng/ μ g of total protein and the median CS (WF6 epitope) levels was 0.408 ng/ μ g of total (n = 36).

During the loaded period, the CS (WF6 epitope) levels around experimental molars ranged from 0.0 to 110.0 ng/mg of total protein, and the median of CS (WF6 epitope) levels was 2.10 ng/ μ g of total protein (n = 212). The CS (WF6 epitope) levels around control mandibular right first molars ranged from 0.0 to 143.3 ng/ μ g of total protein and the median of CS (WF6 epitope) levels was 1.413 ng/ μ g of total protein (n = 106). The CS (WF6 epitope) levels around control maxillary right second molars ranged from 0.0-327.0 ng/ μ g of total protein and the median of CS (WF6 epitope) levels was 1.884 ng/ μ g of total protein (n = 106). The CS (WF6

epitope) levels around miniscrew implants ranged from 0.0 to 114.44 ng/ μ g of total protein and the median of CS (WF6 epitope) levels was 1.827 ng/ μ g of total protein (n = 106).

The medians of CS (WF6 epitope) levels around experimental molars during the loaded period (12 weeks) was significantly greater than those during the unloaded period (2 weeks) ($P < .05$). Around control molars and miniscrew implants, the medians of CS (WF6 epitope) levels during the loaded period were not significantly different from those during the unloaded period.

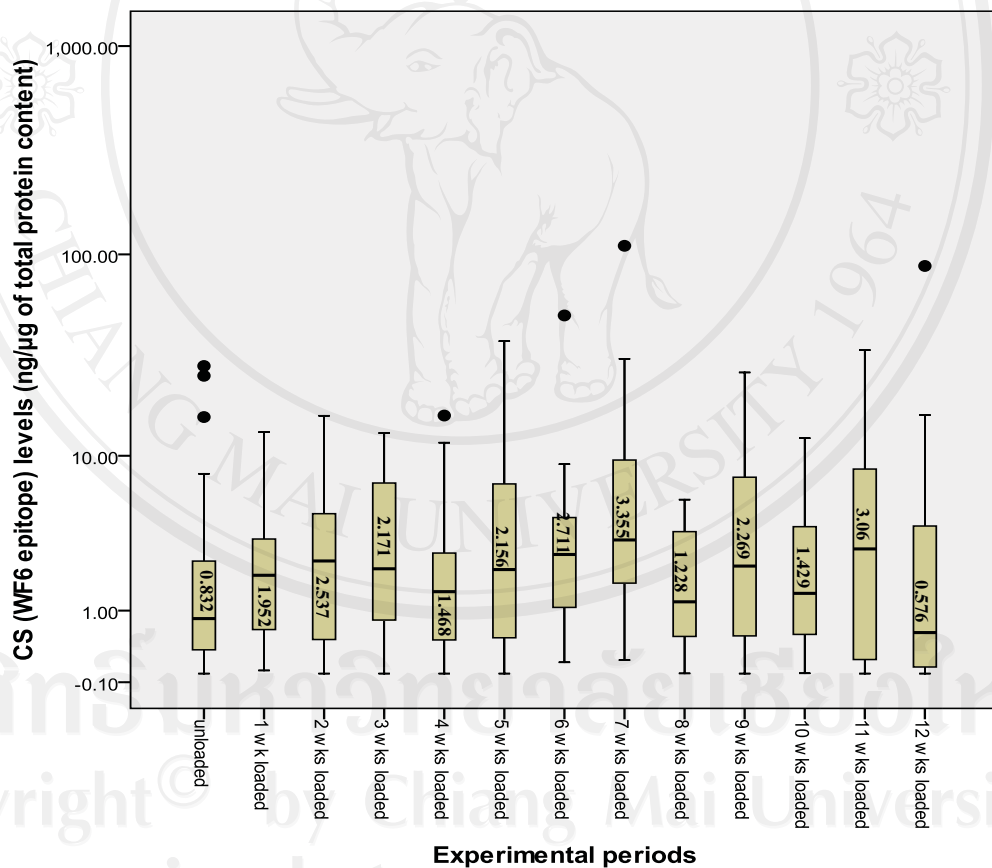


** Significant difference $P < .05$

Figure 4.1 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded (2 weeks) and the loaded (12 weeks) periods around experimental molars, control right mandibular first molars, control right maxillary second molars, and miniscrew implants.

Boxplot graphs of medians of CS (WF6 epitope) levels per total protein in GCF and PMICF around experimental molars, control right mandibular first molars, control right maxillary second molars and miniscrew implants during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks) are shown in Figures 4.2 to 4.5 respectively.

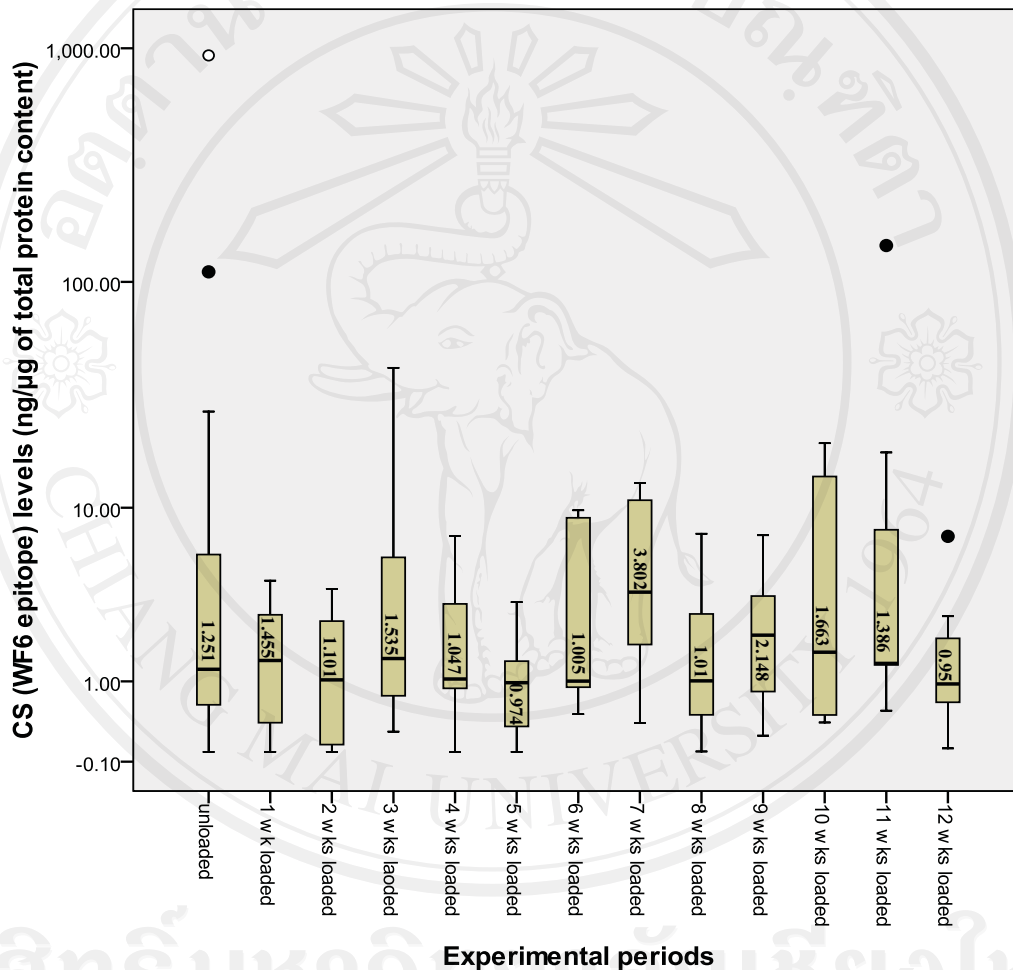
In Figure 4.2, there was no significant difference between the medians of CS (WF6 epitope) levels around experimental molars during the unloaded period (2 weeks) and those during each one-week interval of the loaded period (12 weeks).



** Significant difference $P < .05$

Figure 4.2 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks) around experimental molars.

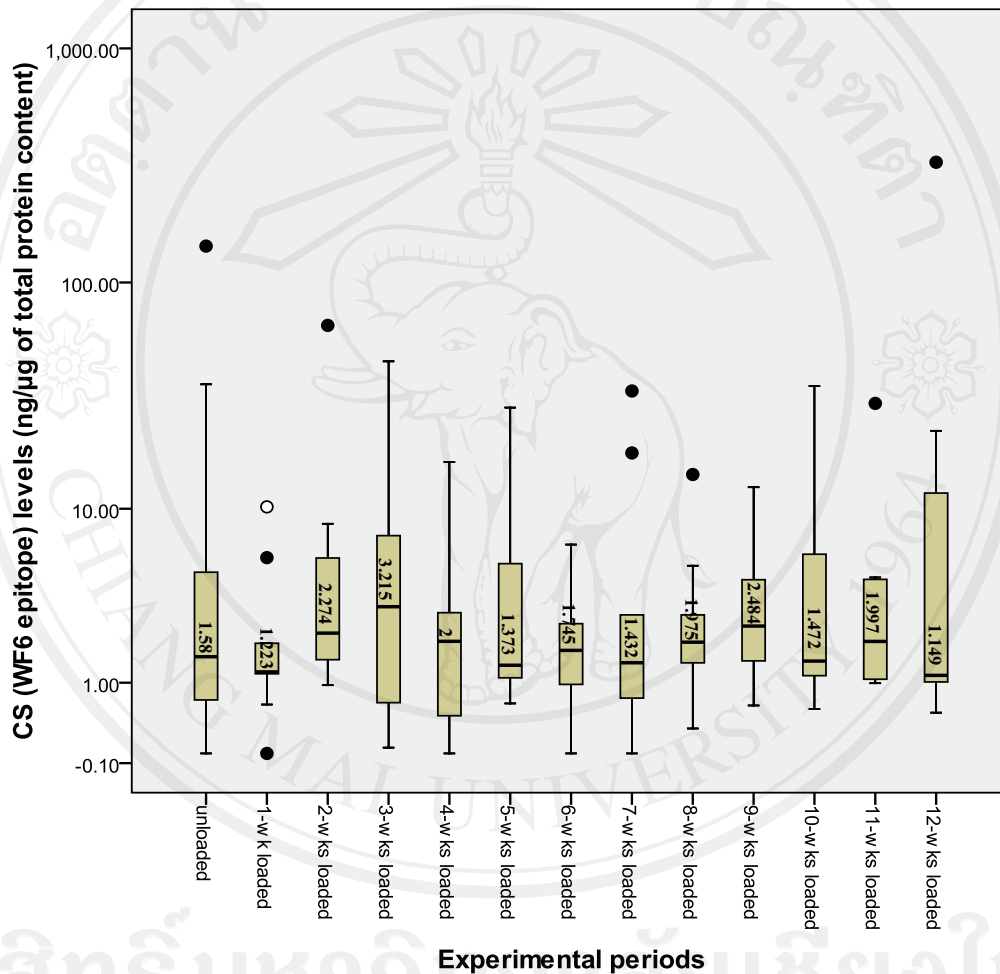
In Figure 4.3, there was no significant difference between the medians of CS (WF6 epitope) levels around control right mandibular first molars during the unloaded period (two-week period) and those during each one-week interval of the loaded period (12 weeks).



** Significant difference $P < .05$

Figure 4.3 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks) around control right mandibular first molars.

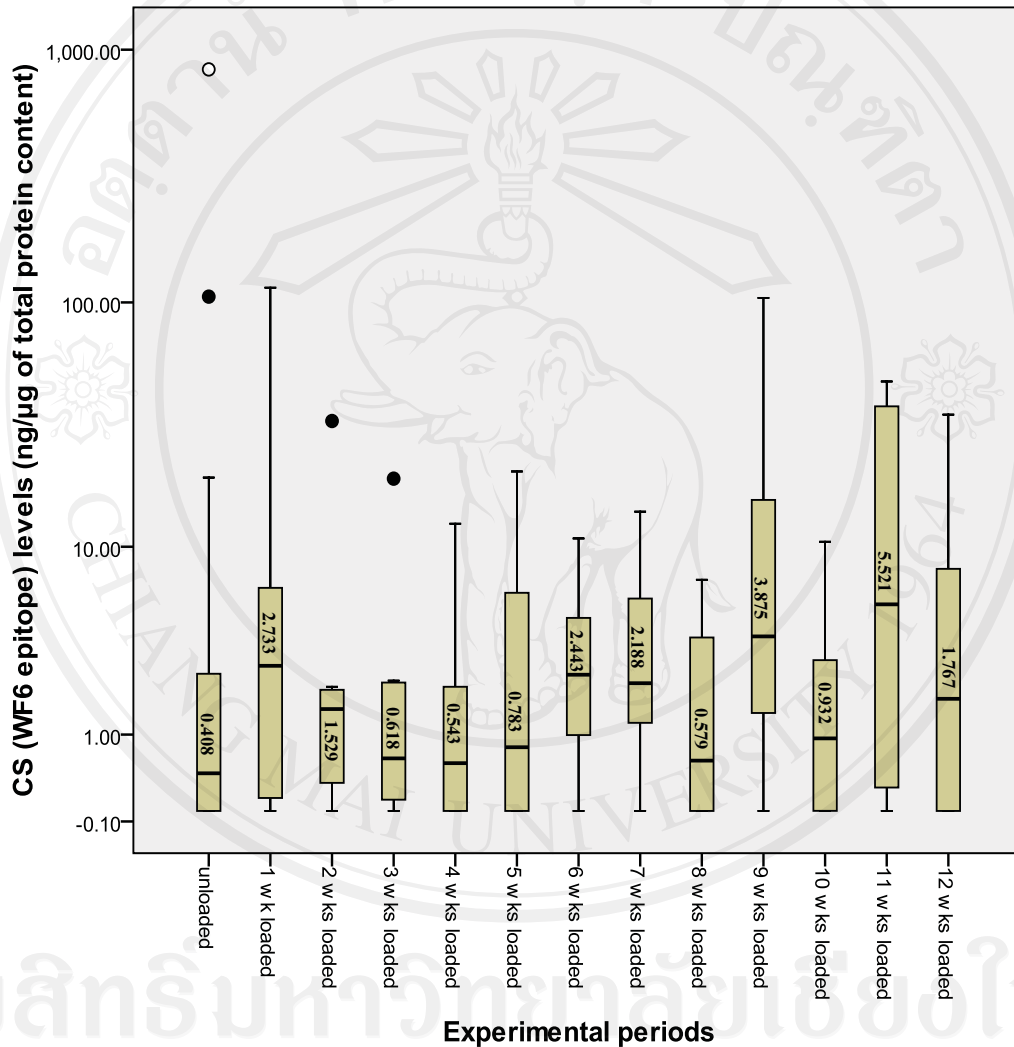
In Figure 4.4, there was no significant difference between the medians of CS (WF6 epitope) levels around control right maxillary first molars during the unloaded period (2 weeks) and those during each one-week interval of the loaded period (12 weeks).



** Significant difference $P < .05$

Figure 4.4 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks) around control right maxillary second molars.

In Figure 4.5, there was no significant difference between the medians of CS (WF6 epitope) levels around miniscrew implants during the unloaded period (2 weeks) and those during each one-week interval of the loaded period (12 weeks).

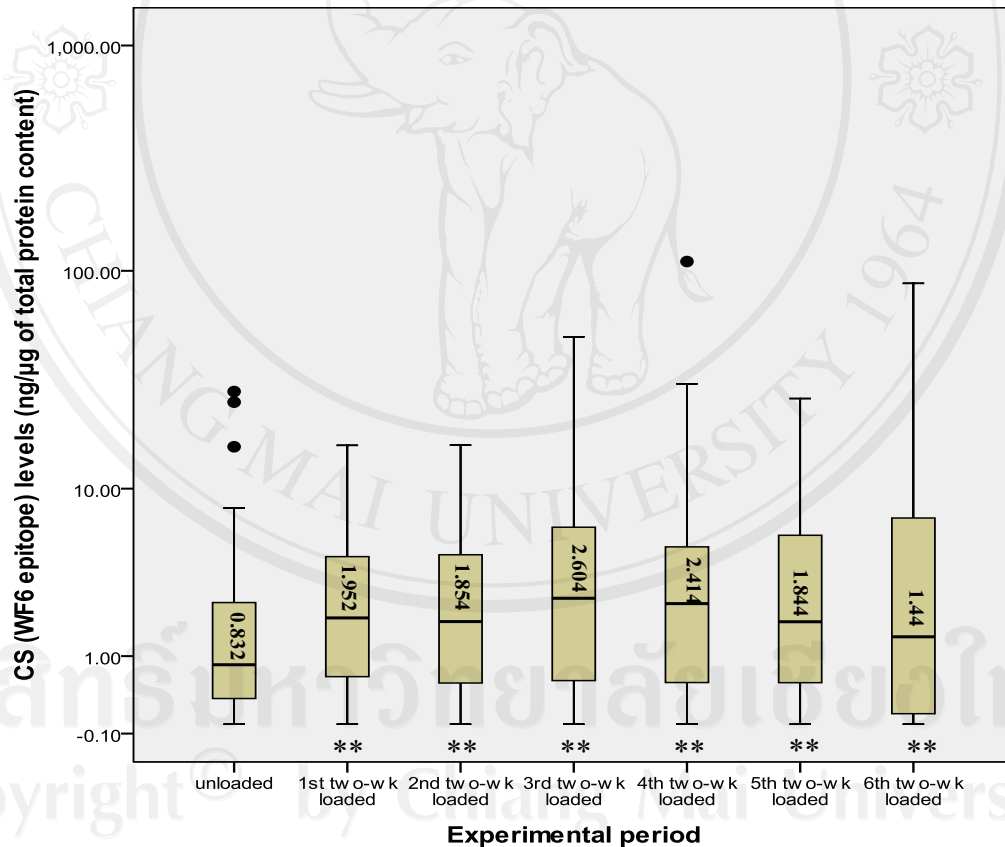


** Significant difference $P < .05$

Figure 4.5 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks) around miniscrew implants.

Boxplot graphs of medians of CS (WF6 epitope) levels per total protein in GCF and PMICF around experimental molars, control right mandibular first molars, control right maxillary second molars and miniscrew implants during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) are shown in Figures 4.6 to 4.9 respectively.

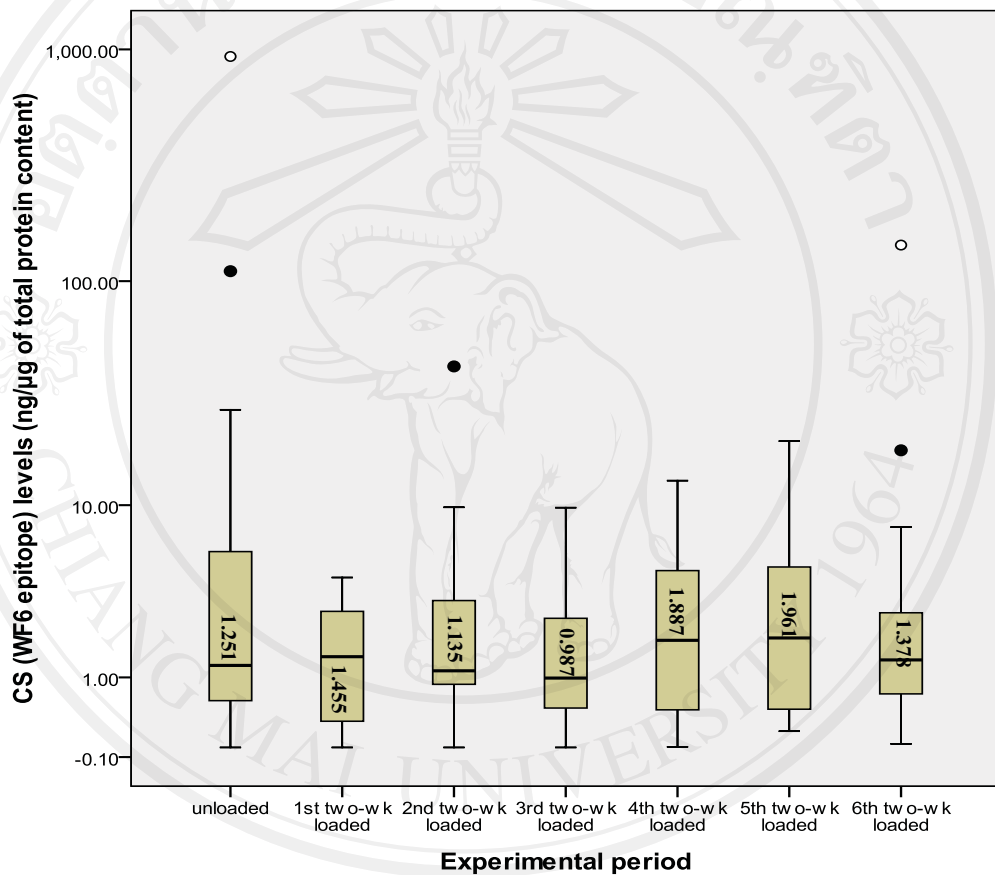
In Figure 4.6, medians of CS (WF6 epitope) levels around experimental molars during each two-week interval of the loaded period (12 weeks) were significantly greater than those during the unloaded period (2 weeks).



** Significant difference $P < .05$

Figure 4.6 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) around experimental molars.

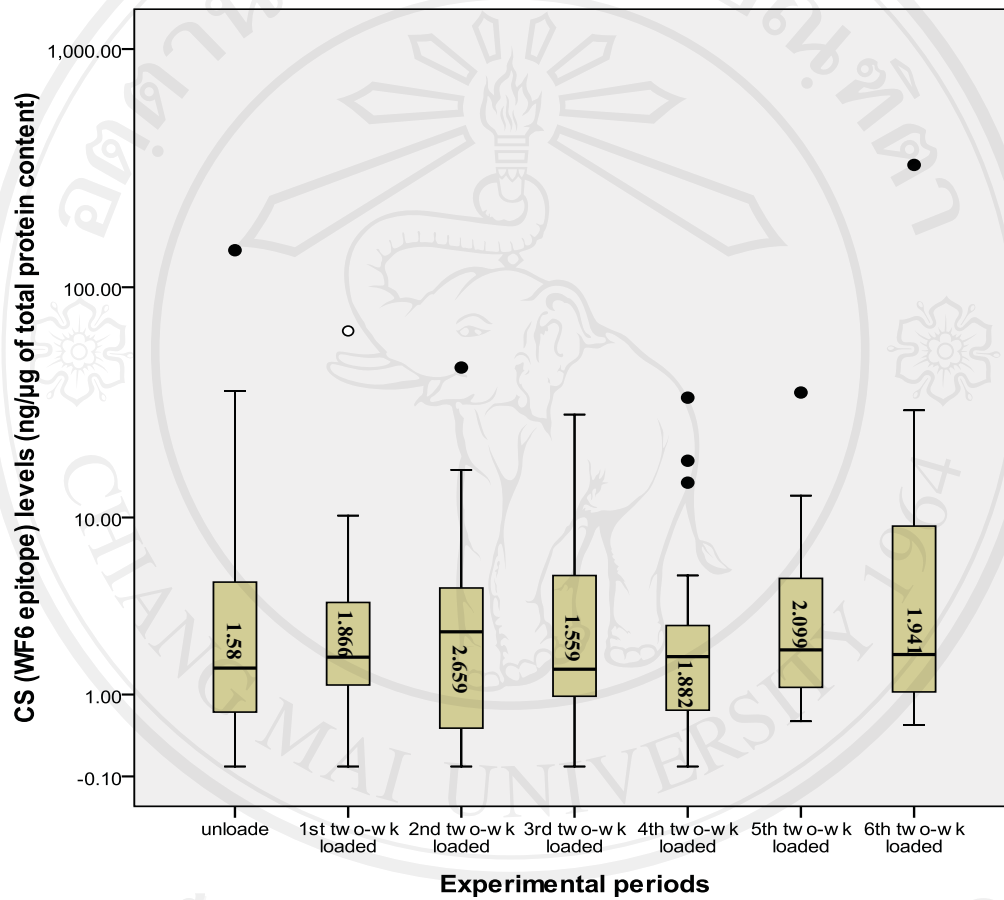
In Figure 4.7, there was no significant difference between the medians of CS (WF6 epitope) levels around control right mandibular first molars during the unloaded period (2 weeks) and those during each two-week interval of the loaded period (12 weeks).



** Significant difference $P < .05$

Figure 4.7 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) around control right mandibular first molars.

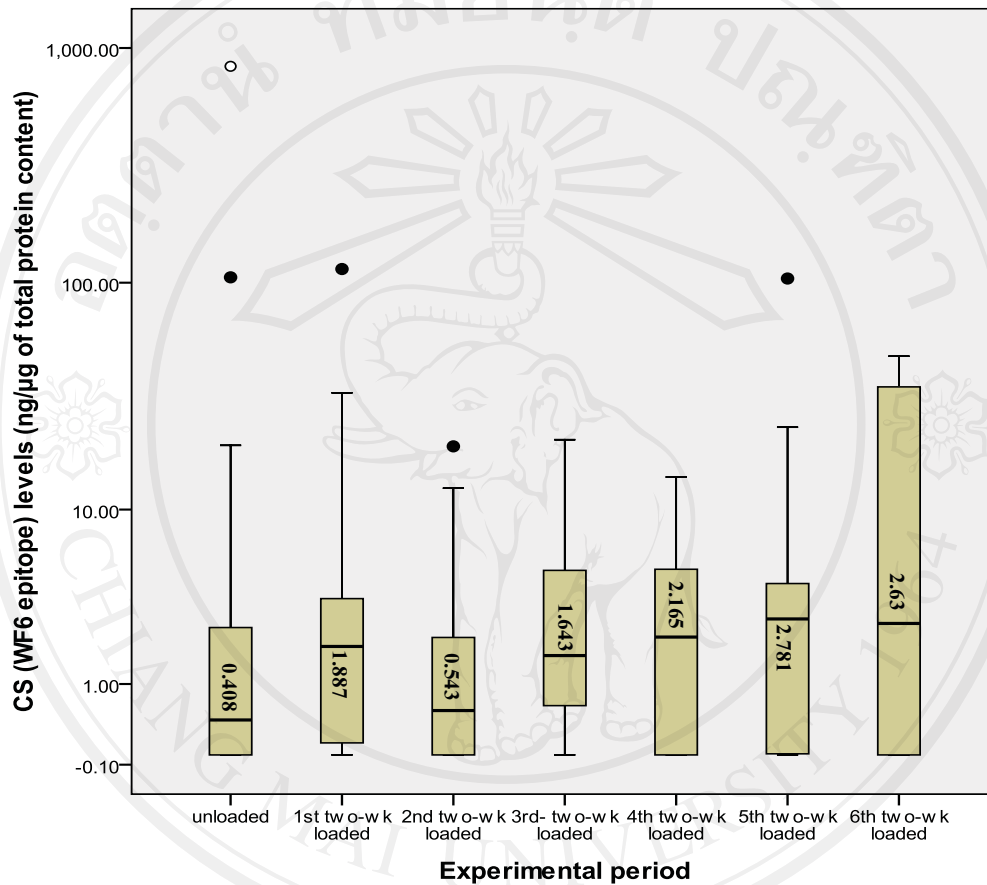
In Figure 4.8, there was no significant difference between the medians of CS (WF6 epitope) levels around control right maxillary second molars during the unloaded period (2 weeks) and those during each two-week interval of the loaded period (12 weeks).



** $P < .05$, compared with value in the unloaded period.

Figure 4.8 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) around control right maxillary second molars.

In Figure 4.9, there was no significant difference between the medians of CS (WF6 epitope) levels around miniscrew implants during the unloaded period (2 weeks) and those during each two-week interval of the loaded period (12 weeks).



** $P < .05$, compared with value in the unloaded period.

Figure 4.9 Boxplot graphs of medians of CS (WF6 epitope) levels during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) around miniscrew implants.

Statistically significant difference was found between the medians of CS (WF6 epitope) levels in the GCF of the intruded experimental molars during the unloaded period (2 weeks) and those during each interval (each three-, four- or six-week interval) of the loaded period (12 weeks) (See Appendix Figures 4.10-4.12). The median of CS (WF6 epitope) levels in the GCF of control molars and in the PMICF of miniscrew implants did not show significant difference during the unloaded period (2 weeks) and each interval of the loaded periods. A constant pattern was not, however, shown. The boxplot graphs of each three-, four- or six-week interval are illustrated in the Appendix (see Appendix Figures A.1-A.12).