CHAPTER IV

RESULTS

Ten miniscrew implants (1.6 mm in diameter, 6.0-9.0 mm in length; Renew Biocare Corp., San Bruno, USA) were used in ten patients, six females and four males, aged 19.0±2.62 years (ranged from 15 to 24 years) as shown in Table 1. After miniscrew implant placement, one miniscrew of a male subject (subject no.10) was clinically mobile, and then removed in the second week. The other screws were immobile over the experimental periods. The success rate of the miniscrew implants was 90%.

Table 1 Age (year) distribution by gender and number of the subjects (n) in each group in this present study.

Gender	**n**	**Age (year)**			
		Minimum	**Maximum**	**Mean**	**Std. Deviation**
Female	6	17.5	24.3	20.20	2.35
Male	4	15.6	22.1	18.40	2.71
Total	10	15.6	24.3	19.00	2.62

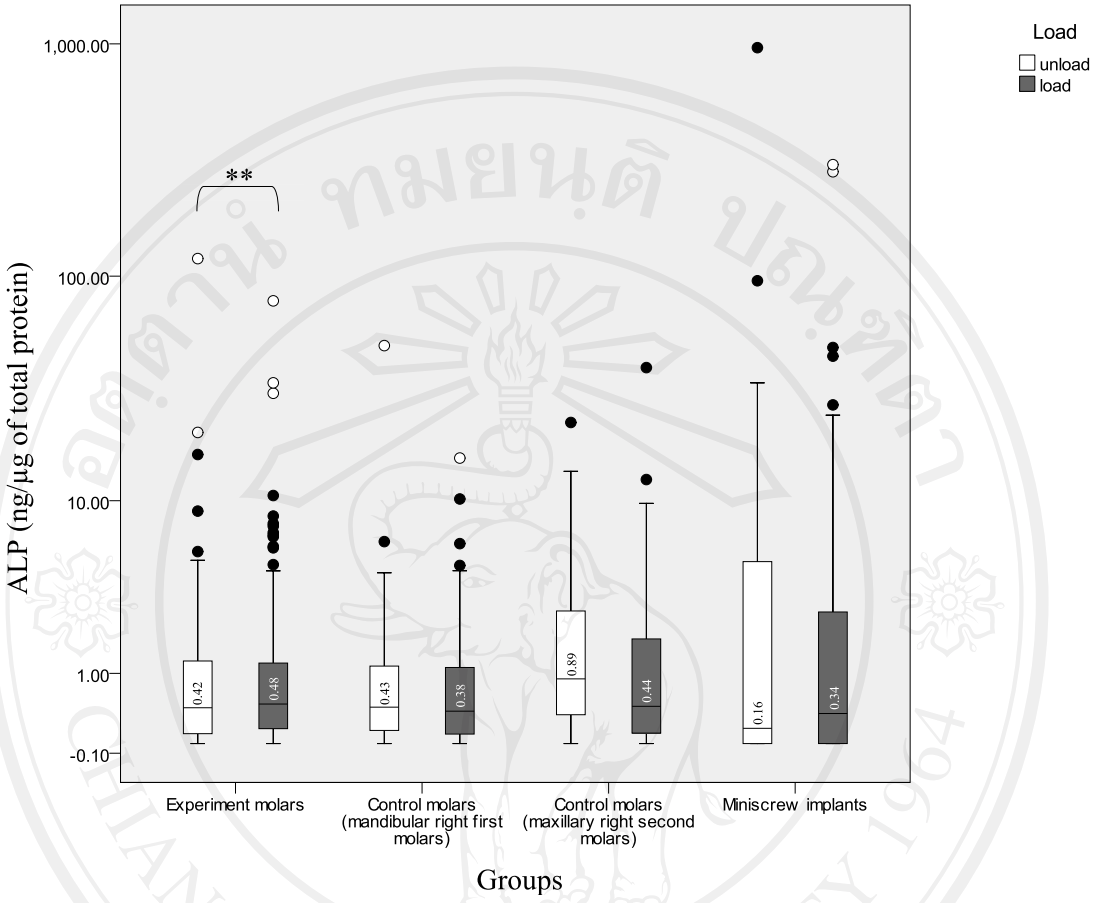
Alkaline phosphatase levels (nanogram per millileter) and total protein levels (microgram per millileter) could be detected in gingival crevicular fluid and peri-miniscrew implant crevicular fluid samples around experimental molars, control molars and miniscrew implants during the unloaded and the loaded experimental periods. It should be noted that the data from the failure case was not included in the calculated results.

During the unloaded period (2 weeks), the alkaline phosphatase levels around experimental molars ranged from 0.0 to 119.11 ng/µg of total protein, and the median of alkaline phosphatase levels was 0.42 ng/µg of total protein (n=90). The alkaline phosphatase levels around right mandibular first molars ranged from 0.0 to 49.88 ng/µg of total protein, and the median of alkaline phosphatase levels was 0.43 ng/µg of total protein (n=45). The alkaline phosphatase levels around right maxillary second molars ranged from 0.0 to 22.82 ng/µg of total protein, and the median of alkaline phosphatase levels was 0.89 ng/µg of total protein (n=45). The alkaline phosphatase levels around miniscrew implants ranged from 0.0 to 963.00 ng/µg of total protein, and the median of alkaline phosphatase levels was 0.16 ng/µg of total protein (n=36).

During the loaded period (12 weeks), the alkaline phosphatase levels around experimental molars ranged from 0.0 to 78.14 ng/µg of total protein, and the median of alkaline phosphatase levels was 0.48 ng/µg of total protein (n=212). The alkaline phosphatase levels around right mandibular first molars ranged from 0.0 to 15.76 ng/µg of total protein, and the median of alkaline phosphatase levels was 0.38 ng/µg of total protein (n=106). The alkaline phosphatase levels around right maxillary

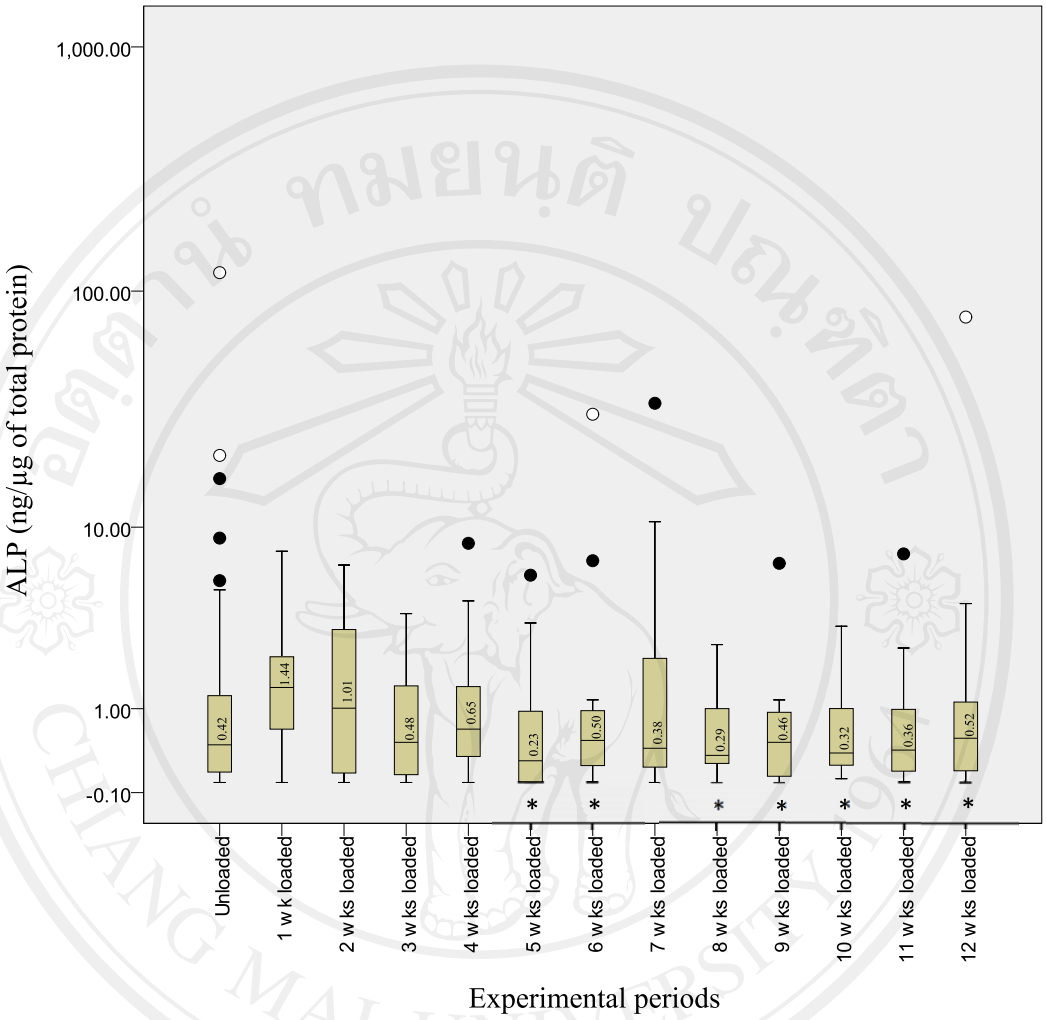
second molars ranged from 0.0 to 39.95 ng/μg of total protein, and the median of alkaline phosphatase levels was 0.44 ng/μg of total protein (n=106). The alkaline phosphatase levels around miniscrew implants ranged from 0.0 to 302.67 ng/μg of total protein, and the median of alkaline phosphatase levels was 0.34 ng/μg of total protein (n=106).

Comparisions of alkaline phosphatase levels between the unloaded period (2 weeks) and the loaded periods (12 weeks) of each group were shown in **Figure 3**. The median of alkaline phosphatase levels around experimental molars during the loaded period was significantly greater than those during the unloaded period ($P < .05$). Around right mandibular first molars, right maxillary second molars and miniscrew implants, the medians of alkaline phosphatase levels during the loaded period were not significantly different from those during the unloaded period.



** Significant difference: $P < .05$.

Figure 3 Boxplot graphs show the medians of alkaline phosphatase levels around experimental molars, control molars and miniscrew implants during the unloaded period (2 weeks) and the loaded periods (12 weeks).

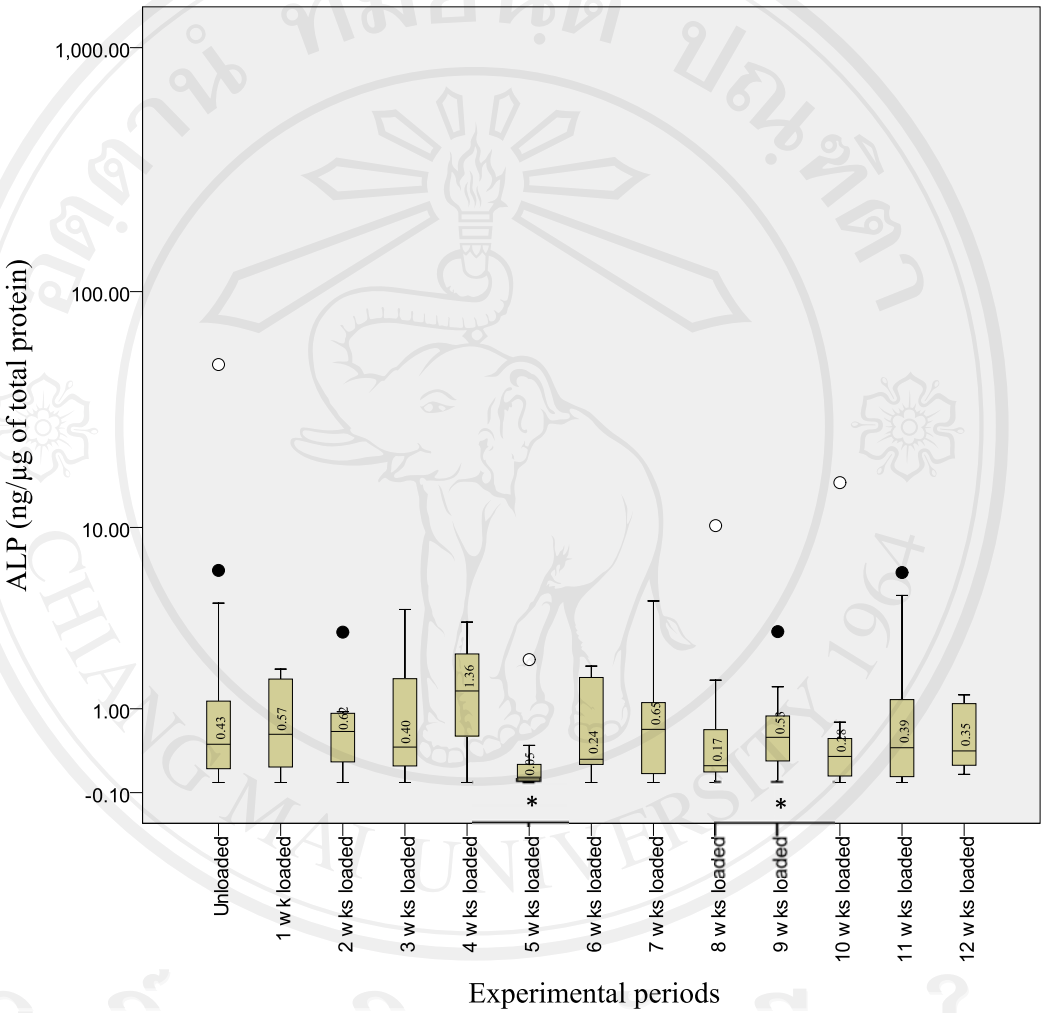


* Significant differences: $P < .05$.

Figure 4 Boxplot graphs show the medians of alkaline phosphatase levels around experimental molars during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks).

The medians of alkaline phosphatase levels around experimental molars during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks) were shown in **Figure 4**. There were significant differences between the medians of alkaline phosphatase levels during the unloaded period and those during

the fifth, the sixth, the eighth, the ninth, the tenth, the eleventh and the twelfth one-week interval of the loaded period ($P < .05$).

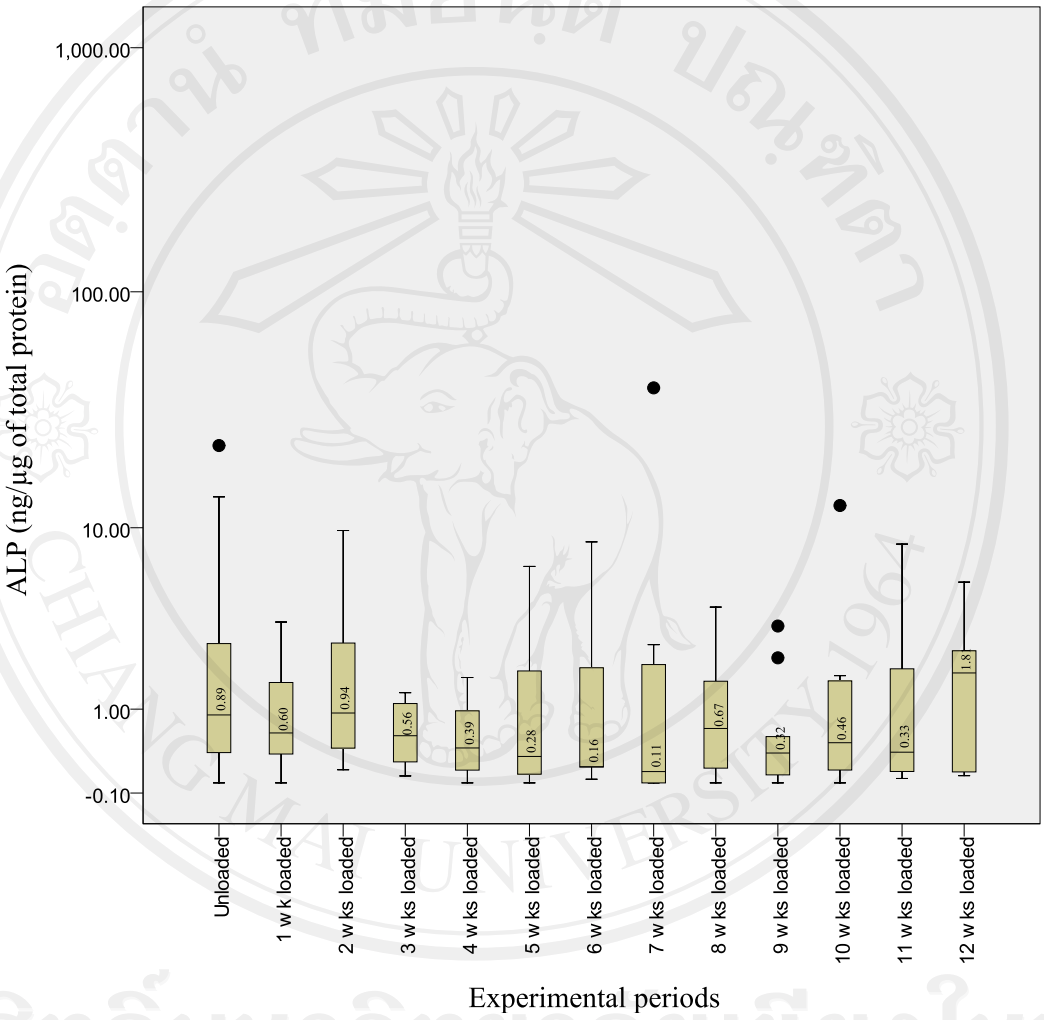


*Significant differences: $P < .05$.

Figure 5 Boxplot graphs show the medians of alkaline phosphatase levels around right mandibular first molars during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks).

The medians of alkaline phosphatase levels around right mandibular first molars during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 week) were shown in **Figure 5**. There were significant differences

between the medians of alkaline phosphatase levels between the unloaded period and those during the fifth and the ninth one-week intervals of the loaded period ($P < .05$).

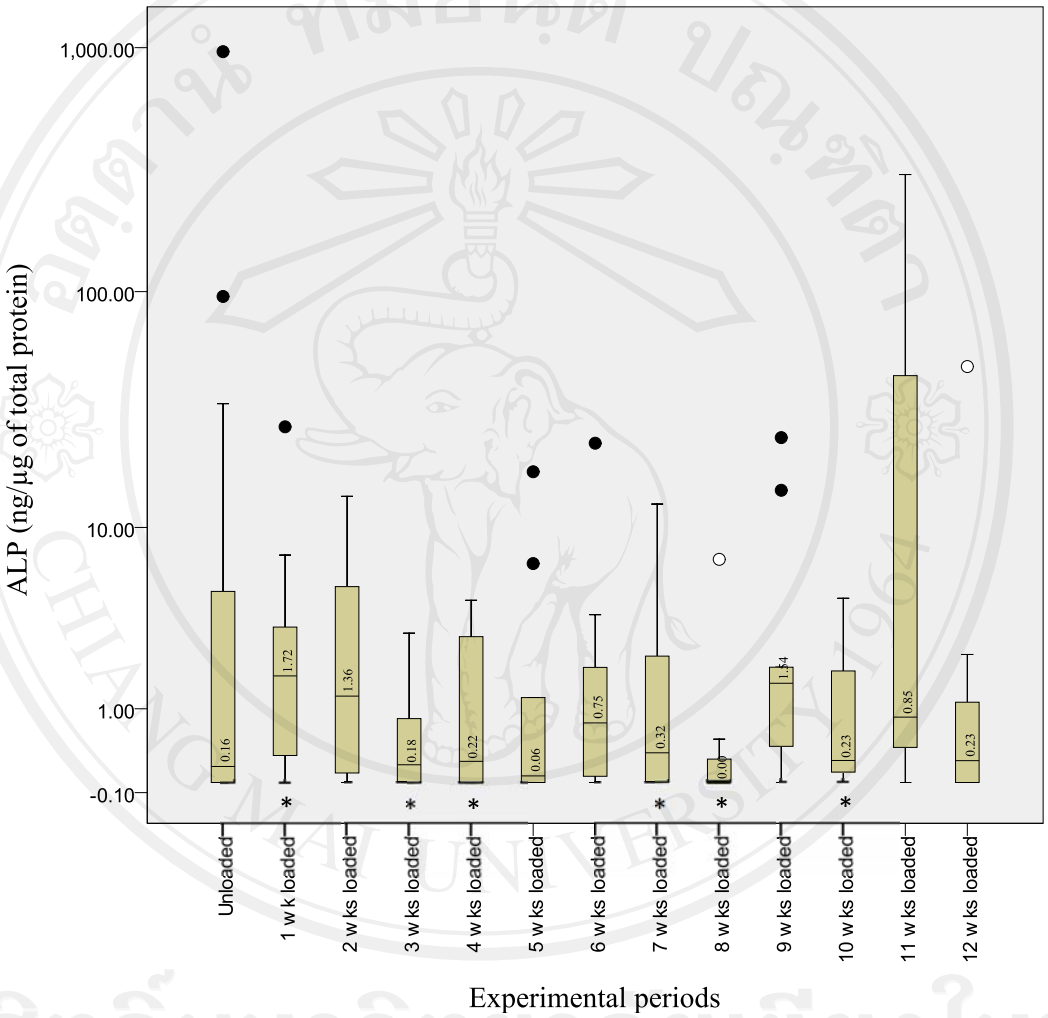


*Significant differences: $P < .05$.

Figure 6 Boxplot graphs show the medians of alkaline phosphatase levels around right maxillary second molars during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks).

The medians of alkaline phosphatase levels around right maxillary second molars during unloaded period (2 weeks) and each one-week interval of the loaded period (12 week) were shown in **Figure 6**. There was no significant difference

between the medians of alkaline phosphatase levels during the unloaded period and those during one-week interval of the loaded period.

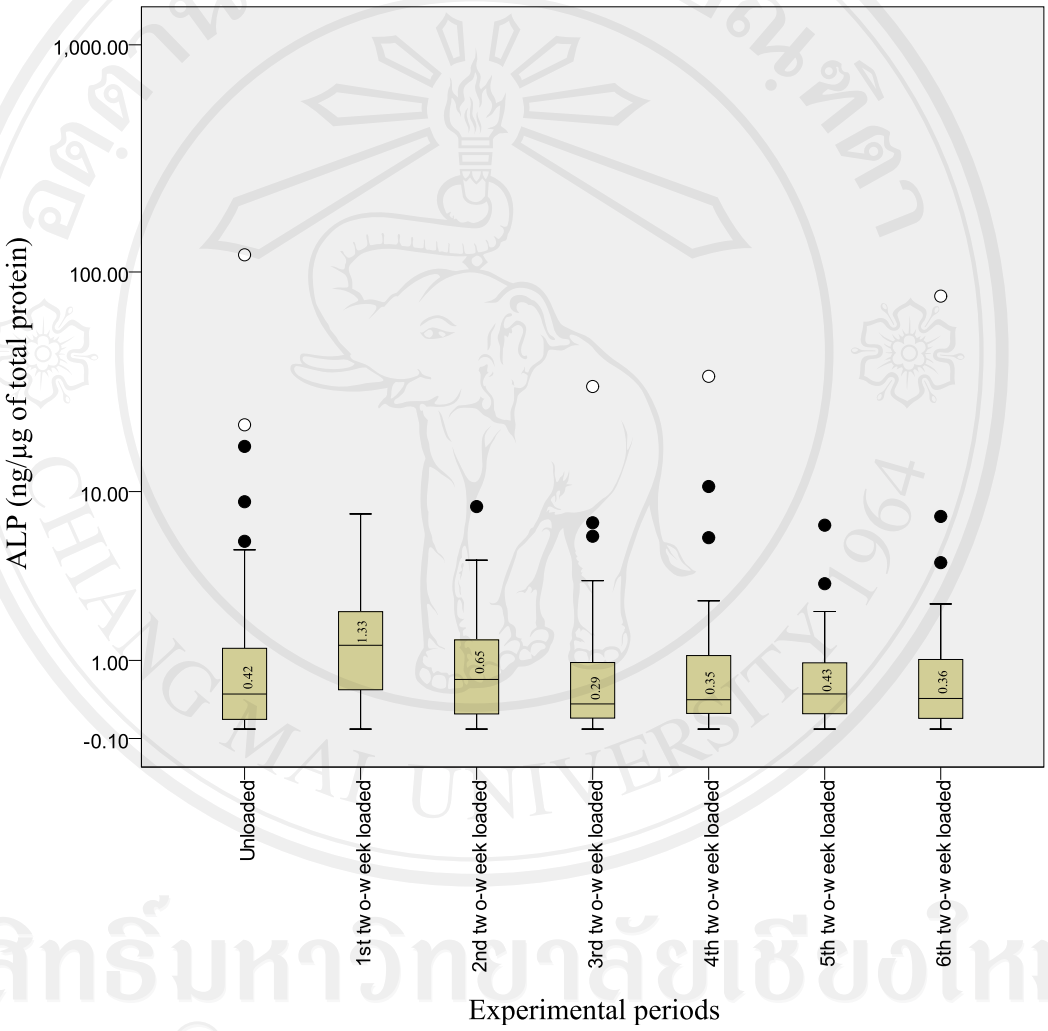


*Significant difference: $P < .05$.

Figure 7 Boxplot graphs show the medians of alkaline phosphatase levels around miniscrew implants during unloaded period (2 weeks) and each one-week interval of the loaded period (12 weeks).

The median of alkaline phosphatase levels around miniscrew implants during the unloaded period (2 weeks) and each one-week interval of the loaded period (12 week) were shown in **Figure 7**. There were significant differences between the

medians of alkaline phosphatase levels during the unloaded period and those during the first, the third, the fourth, the seventh, the eighth and the tenth one-week interval of the loaded period ($P < .05$).

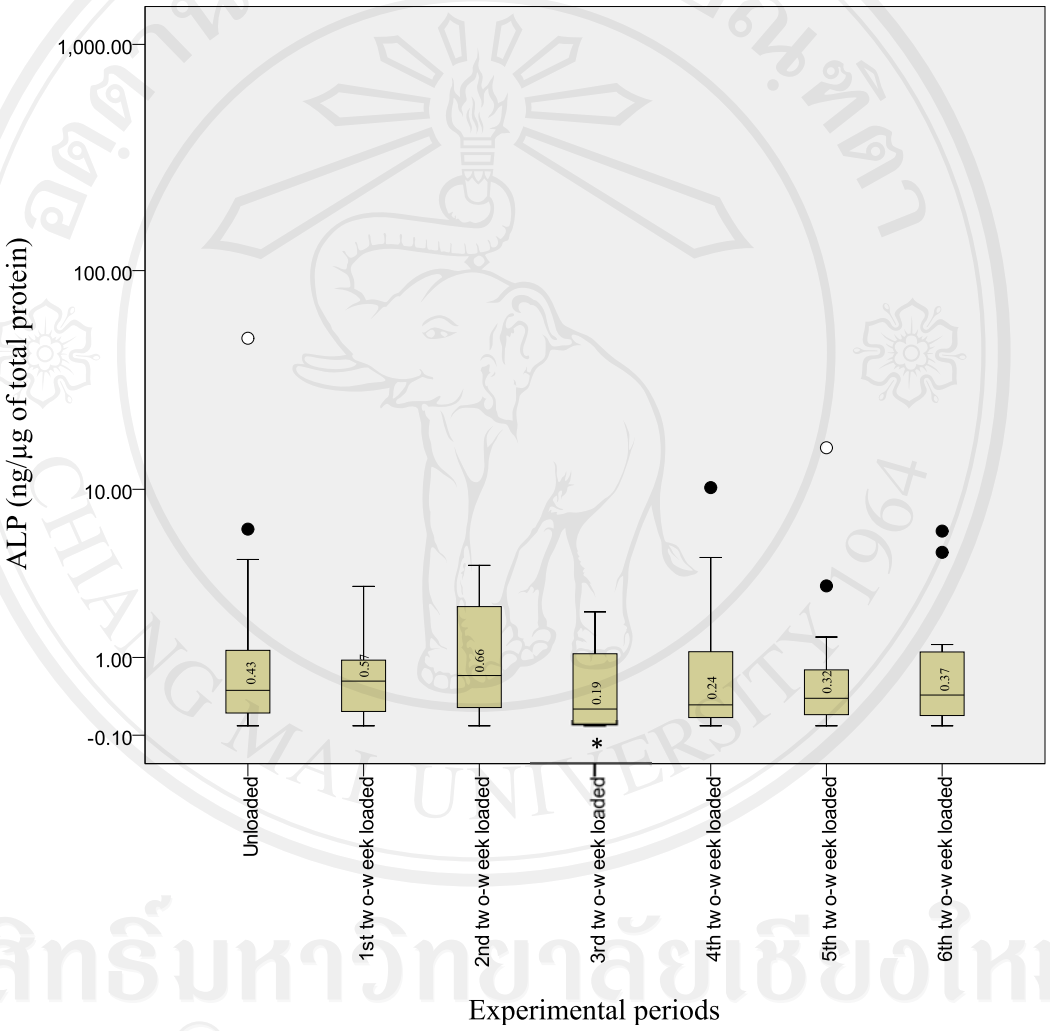


*Significant difference: $P < .05$.

Figure 8 Boxplot graphs show the medians of alkaline phosphatase levels around experimental molars, during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks).

The medians of alkaline phosphatase levels around experimental molars, during the unloaded period (2 weeks) and each two-week interval of the loaded period

(12 weeks) were shown in **Figure 8**. There was no significant difference between the medians of alkaline phosphatase levels during unloaded period and those during each two-week interval of the the loaded period.

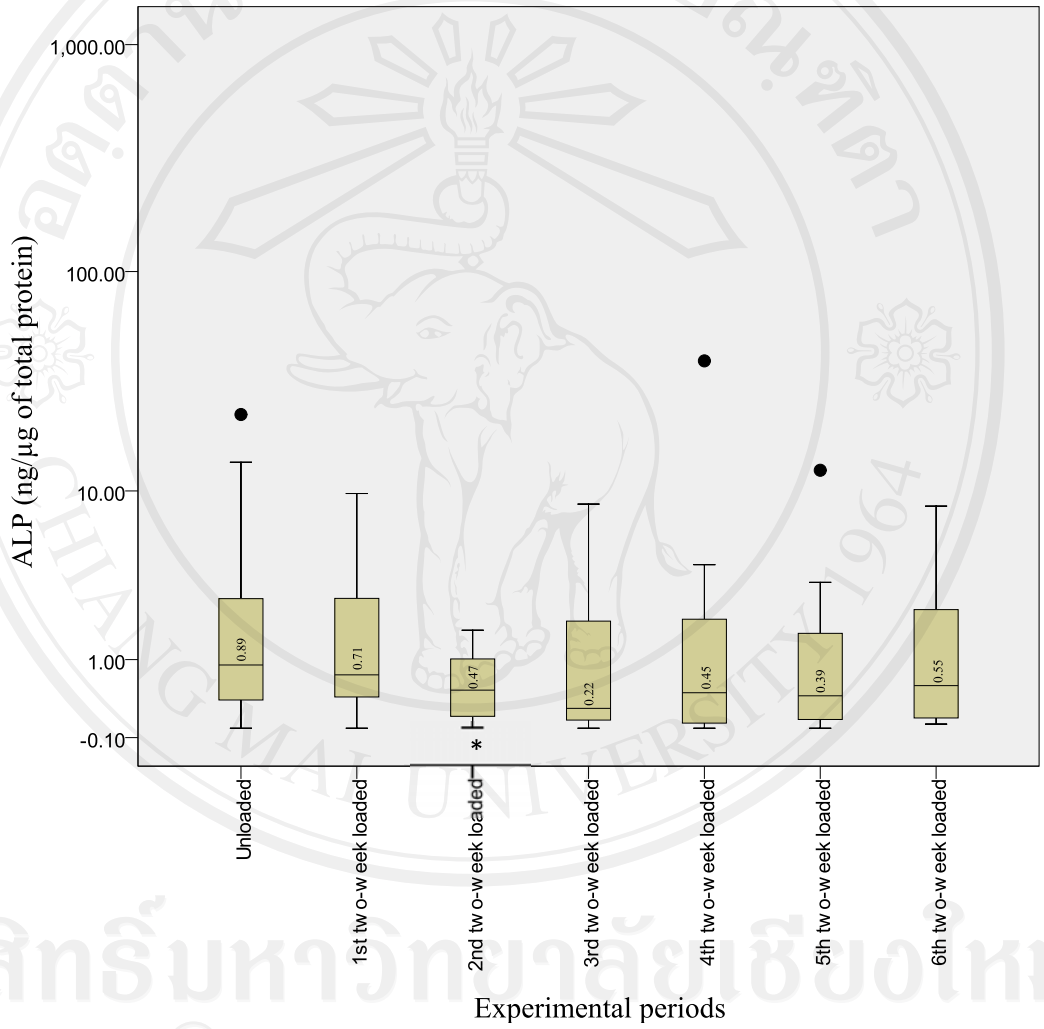


*Significant difference: $P < .05$.

Figure 9 Boxplot graphs show the medians of alkaline phosphatase levels around right mandibular first molars during unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks).

The medians of alkaline phosphatase levels around right mandibular first molars, during unloaded period (2 weeks) and each two-week interval of the loaded

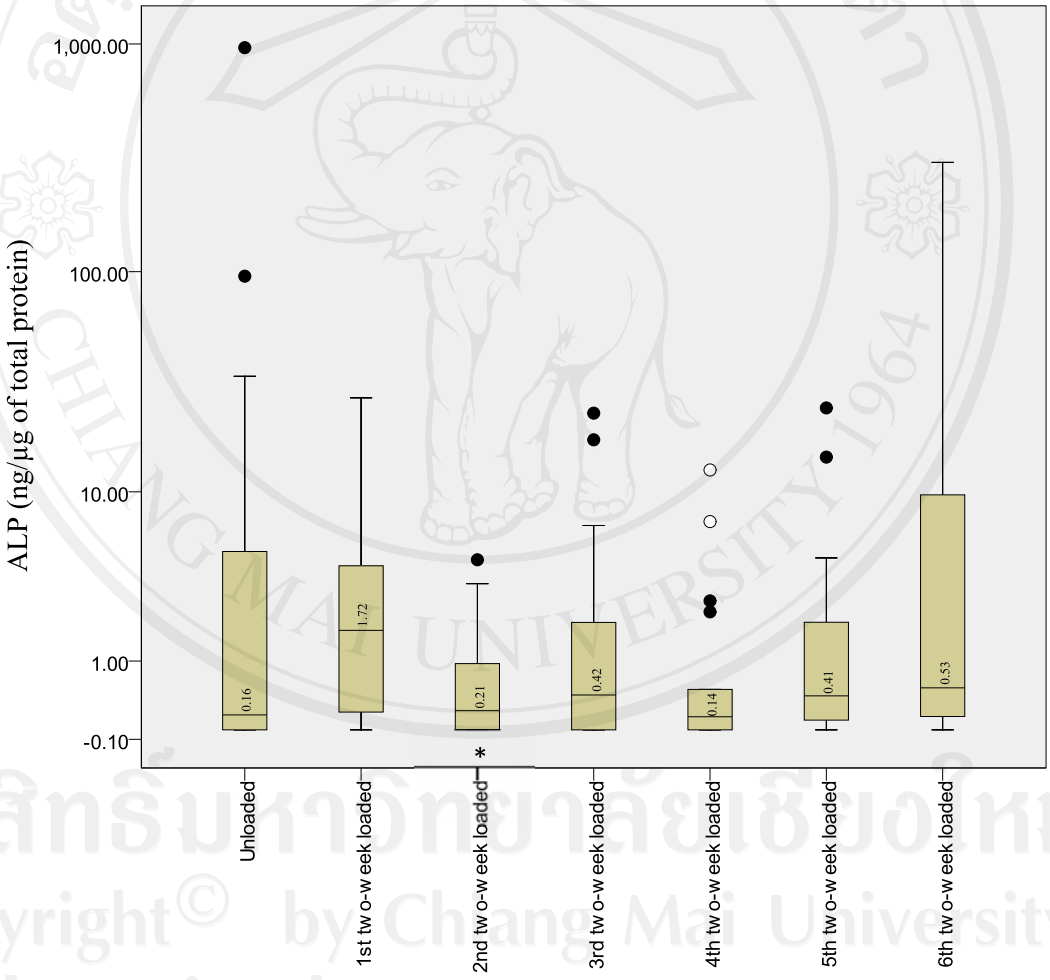
period (12 weeks) were shown in **Figure 9**. There was significant difference between the medians of alkaline phosphatase levels during the unloaded period and those during the third two-week interval of the loaded period ($P < .05$).



*Significant difference: $P < .05$.

Figure 10 Boxplot graphs show the medians of alkaline phosphatase levels around right maxillary second molars during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks).

The medians of alkaline phosphatase levels around right maxillary second molars during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) were shown in **Figure 10**. There was significant difference between the medians of alkaline phosphatase levels during the unloaded period and those during the second two-week interval of the loaded period ($P < .05$).



*Significant difference: $P < .05$.

Figure 11 Boxplot graphs show the medians of alkaline phosphatase levels around miniscrew implants during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks)

The medians of alkaline phosphatase levels around miniscrew implants during the unloaded period (2 weeks) and each two-week interval of the loaded period (12 weeks) were shown in **Figure 11**. There was significant difference between the medians of alkaline phosphatase levels during the unloaded period and those during the second two-week interval of the loaded period ($P < .05$).

In addition, there were some significant differences presenting in comparison between the unloaded period (2 weeks) and the three-week, the four-week and the six-week interval of the loaded period (12 weeks) of all groups. A constant pattern was not; however, shown. Thus boxplot graphs were illustrated in Appendix.