

CHAPTER IV RESULTS

The results were divided into two parts as follows:

4.1 Part I: Five-week period

4.1.1 Clinical observations

Ten miniscrew implants were used in five male patients, aged 22.0 ± 2.9 years (range 18.0 - 24.0 years). At placement and during the unloaded period (one week), all miniscrew implants remained clinically immobile. The success rate of the miniscrew implant was 100%.

During the loaded period (four weeks), on Day 14, two miniscrew implants (MI 5 and MI 8) were mobile (see Appendix Table A.1). One miniscrew implant (MI 5) was displaced and later removed on Day 21. Another miniscrew implant (MI 8) was mobile, but it could serve as an anchorage for orthodontic loading. It was later removed on Day 35. The success rate of the miniscrew implant was 80%.

4.1.2 Chondroitin sulfate epitope (WF6 epitope) levels in PMICF samples

In almost all PMICF samples collected from peri-miniscrew implant sulcus during the unloaded and loaded periods, the CS epitope (WF6 epitope) (in nanogram per milliliter) could be precisely detected.

During the unloaded period, 40 PMICF samples were measured. The CS epitope (WF6 epitope) levels ranged from 0.00 to 58.53 ng/ml (see Appendix Table A.1). The median CS epitope (WF6 epitope) levels at each visit ranged from 1.83 to 8.78 ng/ml (Figure 4.1).

During the loaded period, 38 PMICF samples were measured. The CS epitope (WF6 epitope) levels ranged from 0.00 to 679.89 ng/ml (see Appendix Table A.1). The median CS epitope (WF6 epitope) levels at each visit ranged from 9.53 to 22.68 ng/ml (Figure 4.1).

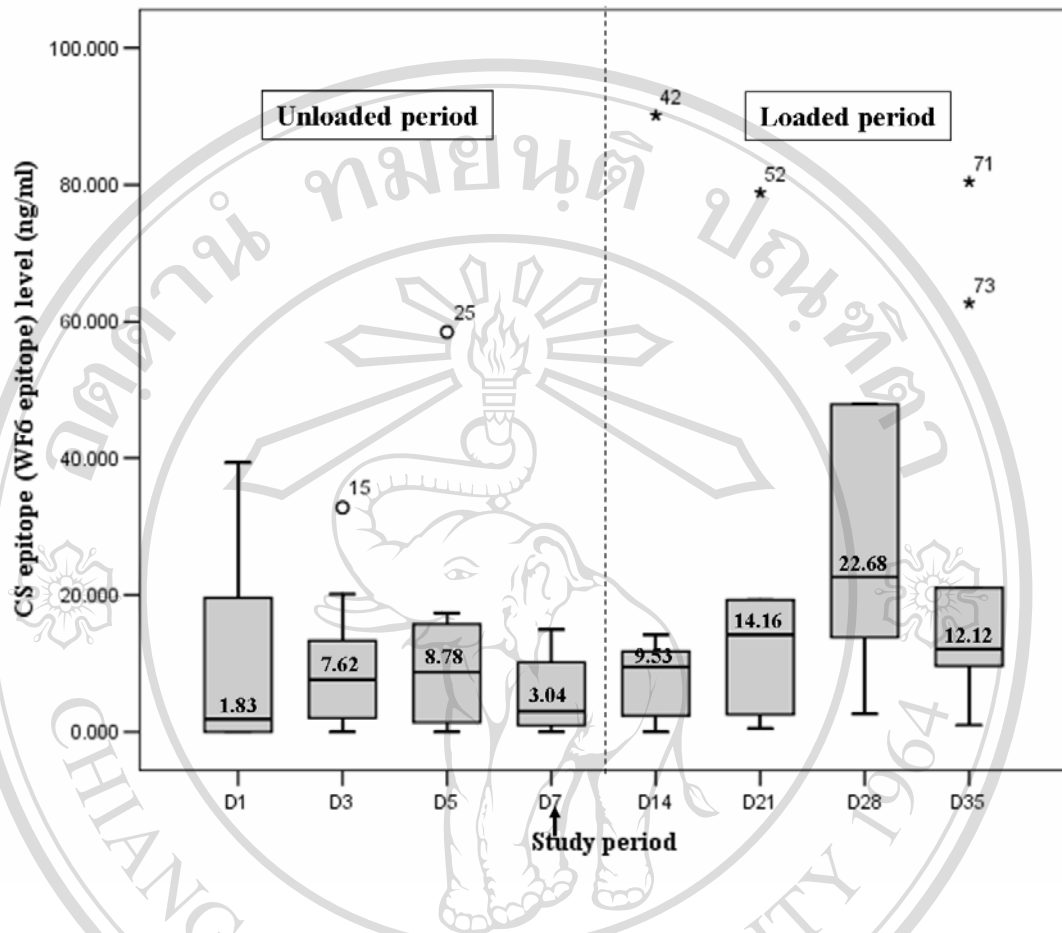
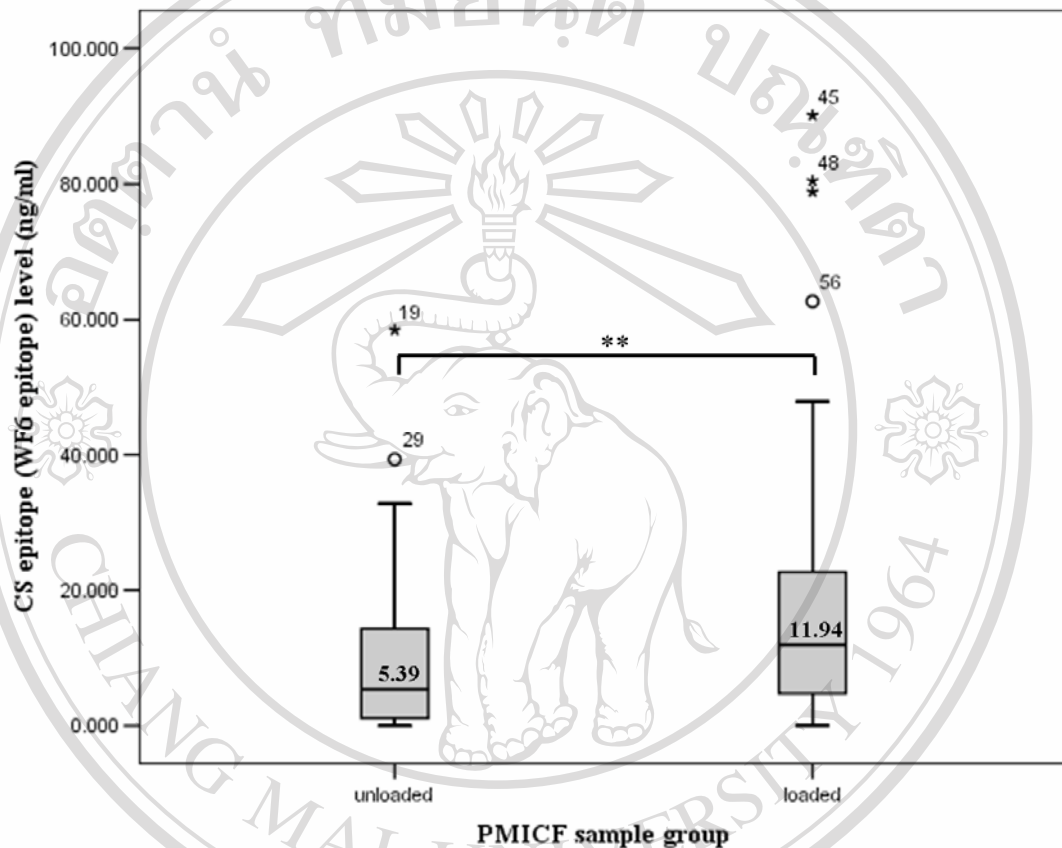


Figure 4 1 The median CS epitope (WF6 epitope) levels (ng/ml) in PMICF samples during the unloaded ($n = 40$) and the loaded ($n = 38$) periods. The arrow indicates the time when force (50g) was applied to the miniscrew implants.

Median CS epitope (WF6 epitope) level during the unloaded and loaded periods were 5.39 and 11.94 ng/ml, respectively. The median CS epitope (WF6 epitope) level during the loaded period was significantly greater than that during the unloaded period ($P < .05$) (Figure 4.2).

It should be noted that one miniscrew implant (MI 5) was mobile. It was displaced and later removed on Day 21. On Day 3 and Day 5, the CS epitope (WF6 epitope) levels in PMICF around that particular miniscrew implant (MI 5) were obviously high. One miniscrew implant (MI 8) was mobile on Day 14, but it could

serve as an anchorage for orthodontic loading until Day 35. One day after placement of that particular miniscrew implant (MI 8), a strikingly high CS epitope (WF6 epitope) level was found (see Appendix Table A.1).



** Significant difference $P < .05$

Figure 4.2 Distribution of CS epitope (WF6 epitope) levels in Part I of the experiment (five-week period) during the unloaded ($n = 40$) and the loaded ($n = 38$) periods. Lines in the boxes show median value.

4.2 Part II: Ten-week period

4.2.1 Clinical observations

Ten miniscrew implants were used in two male and three female patients, aged 20.0 ± 1.9 years (range 18.0-29.0years). During the study period, one patient dropout

on Day 56. So, the PMICF samples from two miniscrew implants (MI 11 and MI 12) could not be collected (see Appendix Table A.4).

At placement and during the unloaded period (one week), all miniscrew implants remained clinically immobile. The success rate of the miniscrew implant was 100%.

During the loaded period (nine weeks), an obvious mobility of one miniscrew implant (MI 20) (see Appendix Table A.4) was detected on Day 70. Then that particular miniscrew implant (MI 20) was removed. The success rate of the miniscrew implant was 90%.

4.2.2 Chondroitin sulfate epitope (WF6 epitope) levels in PMICF samples

During the unloaded period, 40 PMICF samples were measured. The CS epitope (WF6 epitope) levels ranged from 0.00 to 758.03 ng/ml (see Appendix Table A.4). The median CS epitope (WF6 epitope) levels at each visit ranged from 44.77 to 54.85 ng/ml (Figure 4.3).

During the loaded period, 82 PMICF samples were measured. The CS epitope (WF6 epitope) levels ranged from 0.00 to 6,348.90 ng/ml (see Appendix Table A.4). The median CS epitope (WF6 epitope) levels at each visit ranged from 24.69 to 132.35 ng/ml (Figure 4.3).

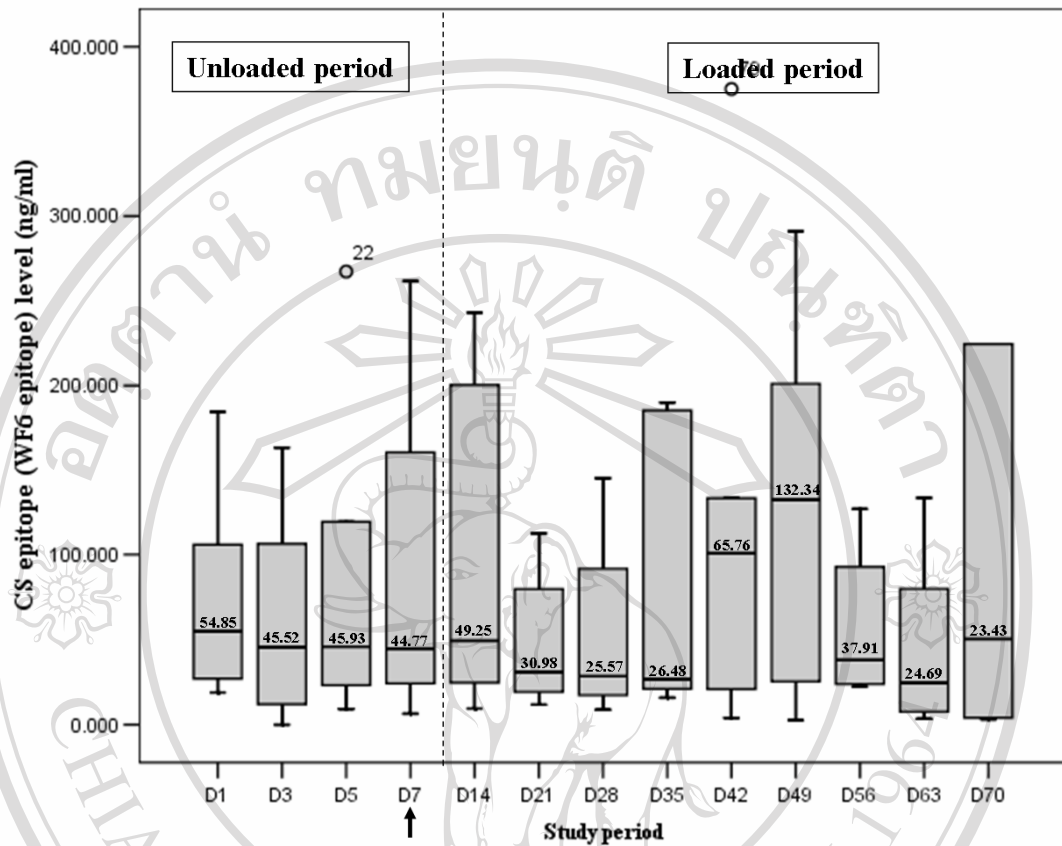
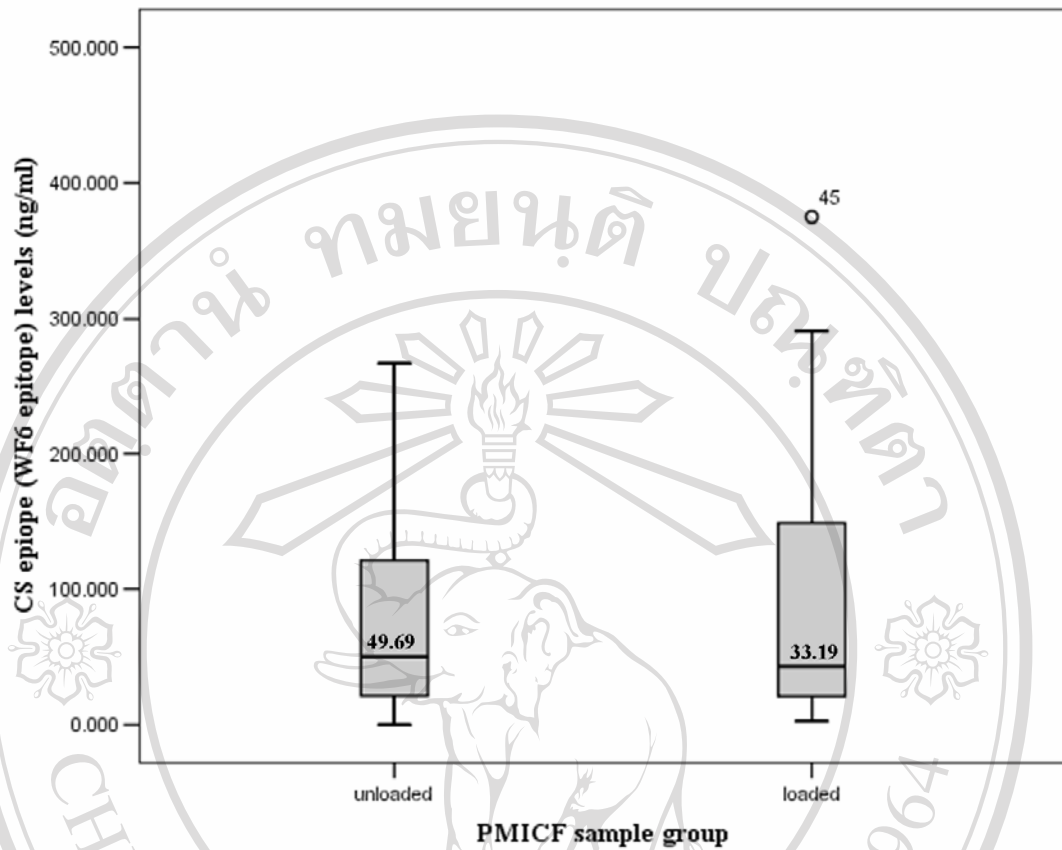


Figure 4.3 The median CS epitope (WF6 epitope) levels (ng/ml) in PMICF samples during the unloaded ($n = 40$) and the loaded ($n = 82$) periods. The arrow indicates the time when force (50g) was applied to the miniscrew implants.

Median CS epitope (WF6 epitope) levels during the unloaded and loaded periods were 49.69 and 33.19 ng/ml, respectively. No significant difference was found between the median CS epitope (WF6 epitope) level during the unloaded period and that during the loaded period (Figure 4.4).

It should be noted that one miniscrew implant (MI 20) was considered, on Day 70, to have failed. Interestingly, 14 days earlier, the CS epitope (WF6 epitope) level in PMICF around that particular miniscrew implant (MI 20) was dramatically high (6348.90 ng/ml) (see Appendix Table A.4).



Significant difference $P < .05$

Figure 4.4 Distribution of CS epitope (WF6 epitope) levels in Part II of the experiment (ten-week period) during the unloaded ($n = 40$) and the loaded ($n = 82$) periods. Lines in the boxes show median value.