

CHAPTER 4

Results

4.1 Effect of local anesthesia

Examples of records made before and after local anesthesia are shown in Fig. 4.1.

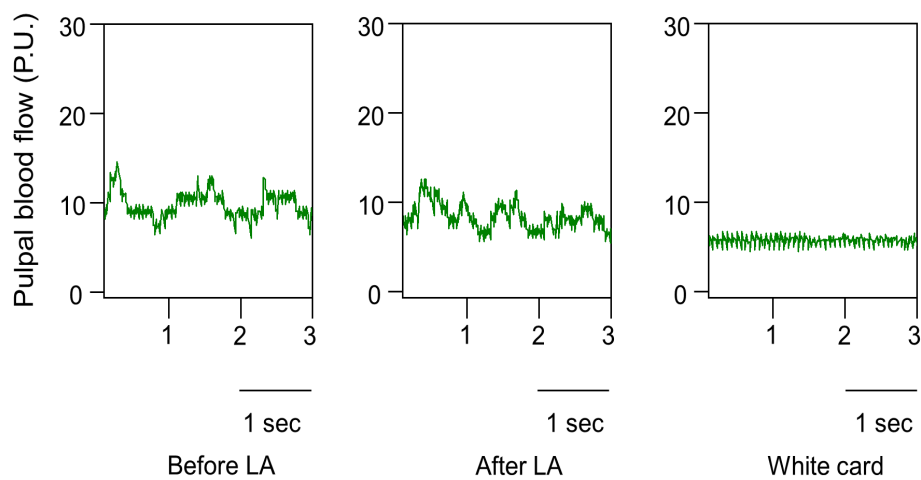


Figure 4.1 Blood flow signals recorded before and after local anesthesia and from white card.

The blood flow signals recorded before and after local anesthesia and from the white card are presented in Figure 4.1.

The value recorded from the white card (6.45 P.U.) was subtracted from all recorded blood flow values, and the products were used to calculate the mean pulpal blood flow values.

The mean \pm S.D. of pulpal blood flow values recorded before and after local anesthesia in all of the teeth ($n = 43$) were 2.62 ± 1.89 and 2.23 ± 1.73 P.U. respectively. The corresponding values in premolars and molars are shown in Table 4.1.

The differences between the two values recorded before and after LA in individual teeth were not significantly different ($p > 0.05$, Student's paired t-test), and when the values for the premolars ($n = 23$) and molars ($n = 20$) were compared separately, they also were not significantly different.

Table 4.1 Mean \pm S.D. of pulpal blood flow values from premolars and molars recorded before and after local anesthesia.

Tooth	Mean \pm S.D. of pulpal blood flow (P.U.)	
	Before LA	After LA
Premolar	2.54 \pm 1.90	1.90 \pm 1.39
Molar	2.73 \pm 1.92	2.61 \pm 2.02

4.2 Effect of tooth preparation

Examples of records made after buccal preparation and after complete preparation are shown in Fig. 4.2.

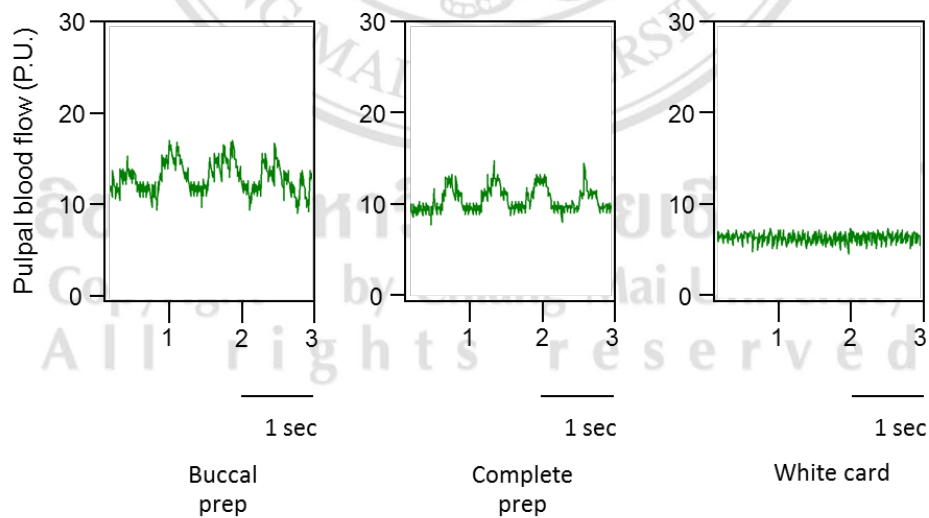


Figure 4.2 Blood flow signals recorded after buccal preparation, after complete preparation and from white card.

The mean \pm S.D. of pulpal blood flow values recorded after buccal preparation and after complete preparation in all teeth ($n = 40$) were 5.63 ± 2.84 and 4.59 ± 2.64 P.U. respectively. The mean pulpal blood flow recorded after complete preparation was significantly lower than that after buccal preparation ($p = 0.0429$, Student's paired t-test). When the values for the premolars and molars were compared separately, as shown in Table 4.2, there was a significant difference only in premolar group ($p = 0.0383$, Student's paired t-test).

Table 4.2 Mean \pm S.D. of pulpal blood flow values from premolars and molars recorded after buccal preparation and after complete preparation.

Tooth	Mean \pm S.D. of pulpal blood flow (P.U.)	
	Buccal preparation	Complete preparation
Premolar	5.46 ± 3.28	3.80 ± 2.37
Molar	5.81 ± 2.37	5.38 ± 2.72

4.3 Effect of gingival retraction

Examples of records made after complete preparation and after gingival retraction are shown in Fig. 4.3.

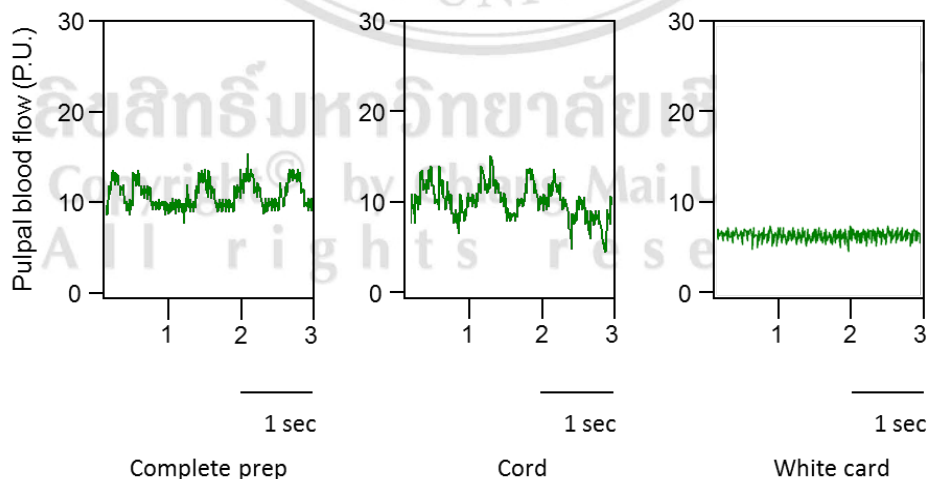


Figure 4.3 Blood flow signals recorded after complete preparation and after gingival retraction.

The mean \pm S.D. of pulpal blood flow values recorded after complete preparation and after gingival retraction in all teeth ($n = 40$) were 4.59 ± 2.64 and 4.52 ± 3.37 , P.U. respectively. The corresponding values in premolars and molars are shown in Table 4.3. The differences between the two values recorded after complete preparation and after gingival retraction in individual teeth were not significantly different ($p > 0.05$, Student's paired t-test), and when the values for the premolars ($n = 20$) and molars ($n = 20$) were compared separately, they also were not significantly different.

Table 4.3 Mean \pm S.D. of pulpal blood flow values from premolars and molars recorded after complete preparation and after gingival retraction.

Tooth	Mean \pm S.D. of pulpal blood flow (P.U.)	
	Complete preparation	Gingival retraction
Premolar	3.80 ± 2.37	3.70 ± 3.20
Molar	5.38 ± 2.72	5.40 ± 3.40

4.4 Effect of temporary cementation

Examples of records made immediately after and one day and seven days after complete preparation, from Groups I and II are shown in Fig. 4.4 A & B.

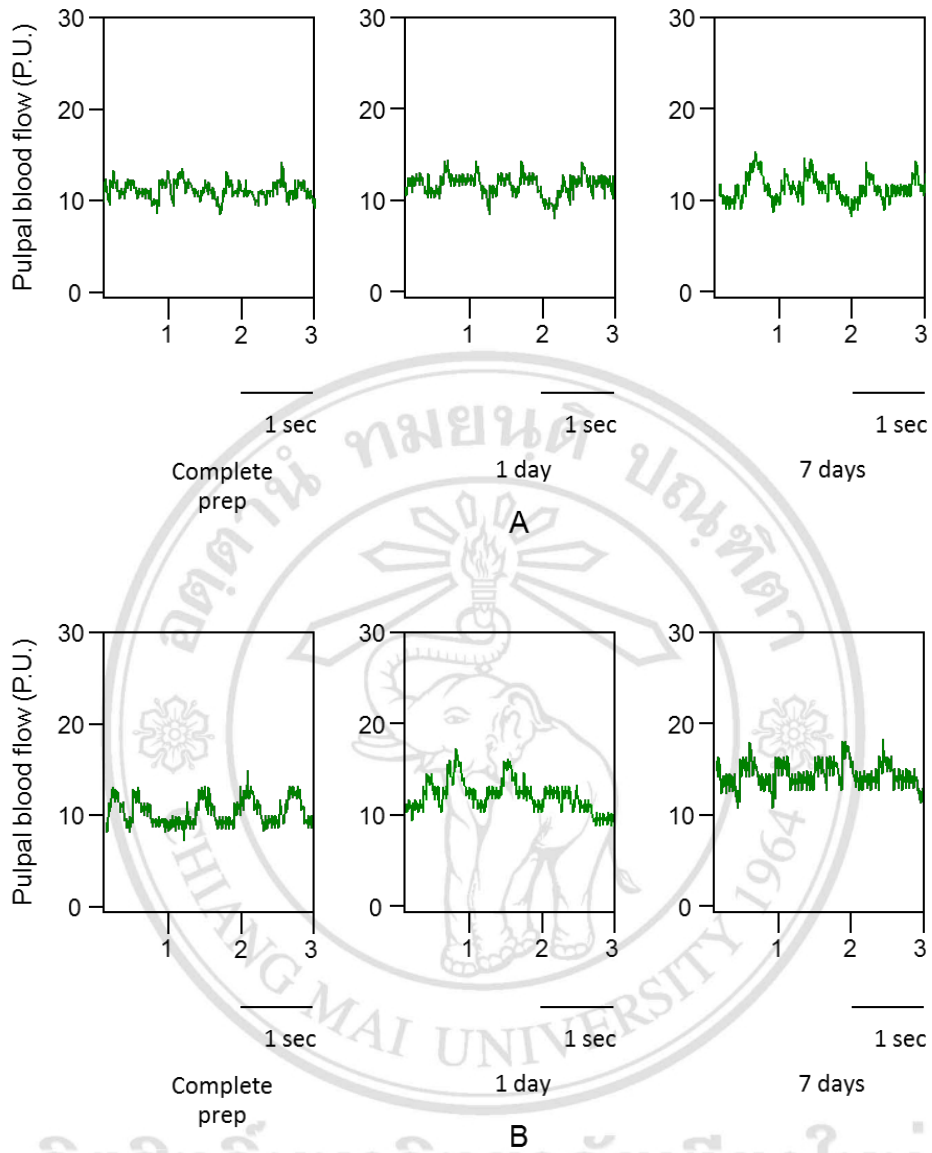


Figure 4.4 Blood flow signals recorded immediately after and one day and seven days after complete preparation.

A. Group I eugenol, B. Group II non-eugenol

The mean \pm S.D. (n = 10) of pulpal blood flow values recorded after complete preparation, and one day and seven days after cementation from premolars and molars in Groups I and II are shown in Table 4.4.

Table 4.4 The mean \pm S.D. of pulpal blood flow values recorded after complete preparation and 1 day and 7 days after cementation from premolars and molars in Groups I and II.

Tooth	Group	Mean \pm S.D. of pulpal blood flow (P.U.)		
		Complete preparation	1 day	7 days
Premolar	I (eugenol)	4.80 \pm 2.54	5.16 \pm 1.52	4.51 \pm 1.23
	II (non-eugenol)	2.79 \pm 1.77	4.42 \pm 4.30	4.94 \pm 2.35
Molar	I (eugenol)	5.74 \pm 2.72	6.76 \pm 3.81	6.98 \pm 4.75
	II (non-eugenol)	5.02 \pm 2.82	5.40 \pm 3.41	5.84 \pm 3.50

After adjusting the PBF values after complete preparation to 100 to produce baseline values, all values from one day and seven days after preparation were adjusted to compare to the baseline value in each group. The mean and S.D. values are shown in Table 4.5.

Table 4.5 Adjusted mean \pm S.D. of pulpal blood flow values from premolars and molars in Groups I and II.

Tooth	Group	Adjusted mean \pm S.D. of pulpal blood flow		
		Complete preparation	1 day	7 days
Premolar	I (eugenol)	100	127.72 \pm 76.55	92.29 \pm 38.03
	II (non-eugenol)	100	138.40 \pm 94.84	238.32 \pm 119.73
Molar	I (eugenol)	100	142.02 \pm 102.64	154.31 \pm 114.03
	II (non-eugenol)	100	121.06 \pm 95.01	134.82 \pm 88.10

The mean pulpal blood flow values in premolar abutment teeth in Group I measured immediately after and one day and seven days after complete preparation were not significantly different ($p>0.05$, two-way RM ANOVA). In premolar abutment teeth in Group II, the mean blood flow values seven days after complete preparation was significantly higher than those immediately after and one day after complete preparation ($p = 0.042$ and $p< 0.001$, respectively, Two-way RM ANOVA). The mean values immediately after complete preparation was not significantly different from that one day after complete preparation. The mean pulpal blood flow seven days after complete preparation in Group II was significantly higher than that in Group I ($p< 0.001$) but there was no significant difference one day after complete preparation.

The mean pulpal blood flow values after complete preparation and one day and seven days after complete preparation in Groups I and II in molar abutment teeth were not significantly different ($p>0.05$, two-way RM ANOVA).

The differences between the blood flow values obtained from each tooth in the control group of un-operated, mandibular first premolars ($n = 3$) at all seven conditions under which recordings were made, were also not significantly different, as shown in Table 4.6.

Table 4.6 Mean \pm S.D. blood flow values of the un-operated first premolars under seven conditions.

Before LA	After LA	Buccal preparation	Complete preparation	Cord	1 day	7 days
1.89 \pm 1.52	2.14 \pm 0.93	2.46 \pm 0.46	2.38 \pm 0.88	2.47 \pm 1.89	1.83 \pm 0.62	2.02 \pm 1.03

There was no significant change in the DC levels (backscattered light intensity) recorded by the laser Doppler flow monitor from each tooth at each stage during the experiment ($p > 0.05$, two-way RM ANOVA).

The subjects experienced minimal symptoms after the temporary bridges had been fitted; for 36 of the 40 abutment teeth there was no sensitivity to hot or cold, no pain during eating, and no spontaneous pain. For the other 4, the subjects experienced slight pain when drinking cold water, but no pain during eating and no spontaneous pain.

Seven days after cementation of the permanent bridges, the subjects reported no symptoms.



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