

Chapter Four

Results

4. Results:

In this present study, a linear measurement system of evaluating the coronal microleakage in endodontically treated teeth restored with different post systems and different cements was used in analysing the data. The analysis of data for each post group was done separately; as the result was not significant, the evaluation was done for both types of post systems together.

4.1 Evaluation of coronal microleakage among different types of Cements:

4.1.1 Descriptive statistics:

The mean percentages values through different cements were as the following:

For the resin cement groups for both fibre and metal posts, the leakage values ranged from 0.05% to 4.8% as shown in Table 4.1 with a mean value of 1.53%

For the zinc phosphate cement groups for both fibre and metal posts, the leakage values ranged from 0.21% to 5.8% as shown in Table 4.2 with a mean value of 1.72%

For the glass ionomer cement groups for both fibre and metal posts, the leakage values ranged from 0.13% to 3.4% as shown in Table 4.3 with a mean value of 0.92%

For the root canal treatment groups (control group), the leakage values ranged from 0.87% to 7% as shown in Table 4.4 with a mean value of 2.31%

The lowest mean percentages value of leakage was recorded from 0.05% regardless of the type of cements used. Regardless of the type of posts used, glass ionomer cement group were the lowest mean value (0.92%) and root canal treatment group were the highest mean value (2.31%).

Table 4.1 The mean percentages value of the dye infiltration for the resin cement groups for both fibre and metal posts

Group	Specimen #	Mean of coronal microleakage (%)
Fiber post with resin cement		
	1	1.59
	2	1.17
	3	0.15
	4	0.05
	5	0.6
	6	1.59
	7	1.22
	8	0.25
	9	1.58
	10	0.6
Metal post with resin cement		
	1	4.8
	2	2.27
	3	1.94
	4	0.66
	5	3.78
	6	2.72
	7	1.21
	8	1.24
	9	2.06
	10	0.73

Table 4.2 The mean percentages value of the dye infiltration for the zinc phosphate cement groups for both fibre and metal posts

Group	Specimen #	Mean of coronal microleakage (%)
Fiber post with zinc phosphate cement		
	1	3.71
	2	1.71
	3	0.57
	4	0.21
	5	0.66
	6	0.3
	7	0.52
	8	2.22
	9	1.62
	10	0.26
Metal post with zinc phosphate cement		
	1	5.8
	2	2.54
	3	0.98
	4	4.6
	5	2.4
	6	0.9
	7	2.36
	8	0.8
	9	1.72
	10	0.24

Table 4.3 The mean percentages value of the dye infiltration for the glass ionomer cement groups for both fibre and metal posts

Group	Specimen #	Mean of coronal microleakage (%)
Fiber post with glass ionomer cement		
	1	0.21
	2	2.39
	3	0.74
	4	0.13
	5	0.5
	6	3.4
	7	0.41
	8	0.14
	9	0.35
	10	0.24
Metal post with glass ionomer cement		
	1	0.58
	2	0.19
	3	0.18
	4	1.5
	5	3.38
	6	1.11
	7	0.32
	8	0.55
	9	1.3
	10	0.87

Table 4.4 The mean percentages value of the dye infiltration for the root canal treatment groups (control group)

Group	Specimen #	Mean of coronal microleakage (%)
RCT		
	1	3.17
	2	2.47
	3	1.39
	4	7.00
	5	1.02
	6	3.6
	7	1.24
	8	1.38
	9	0.87
	10	1.02

4.1.2 Statistical analysis:

Before comparison between the cements was done, the assumption of normality and homogeneity were tested. As a result, all the assumptions were not met. Thus the nonparametric analysis test (Kruskal–Wallis test) was used while setting the significance of test at 5% ($p < 0.05$).

Kruskal–Wallis test was used to compare the mean percentages of leakage between 3 different cements and the RCT group. The results were shown in Table 4.5 and Figure 4.1.

Table 4.5 Comparison of coronal microleakage between 3 different cements and RCT

Cement	N	Median (IQR)	P value#
Resin cement	20	1.41 (1.42)	0.018*
Zinc phosphate cement	20	1.30 (1.84)	
Glass ionomer cement	20	0.52 (1.03)	
RCT	10	1.38 (2.26)	
Total	70		

#Kruskal–Wallis test

* Significant $p < 0.05$

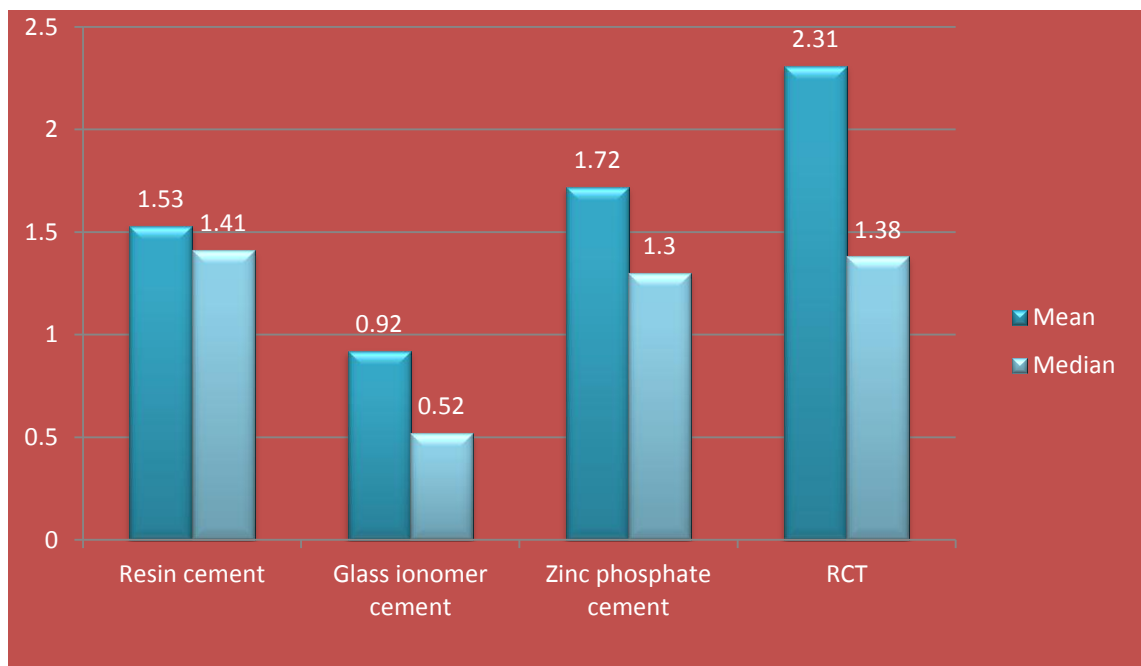


Figure 4.1 Comparison of coronal microleakage (%) between 3 different cements and RCT group.

According to the results, significant differences were found between the different types of the cements and the RCT group ($p= 0.018$). Because of the significant nature of the result, Mann–Whitney U test was done for pairwise comparison. Results are shown in Table 4.6

Table 4.6 Pairwise comparison of microleakage between different types of cement and RCT

	Glass ionomer cement	Zinc phosphate cement	RCT
Resin cement	0.21	4.86	1.8
Glass ionomer cement		0.16	0.03*
Zinc phosphate cement			1.3

*Significant $p<0.05$

Pairwise comparison showed that significant difference in microleakage was only found between glass ionomer cement groups and root canal treatment group (control group) $p= 0.03$ but no significant difference between the other Pairs.

4.2 Evaluation of coronal microleakage among different types of post system and RCT group:

4.2.1 Descriptive statistics:

Regardless of the type of cements, the mean value of coronal microleakage of fiber post was 0.98%, the mean value of coronal microleakage of titanium post was 1.80%, and the mean value of coronal microleakage of RCT group was 2.31%.

Therefore, it can be concluded that the lowest microleakage value was in fiber post groups and the highest microleakage value was in RCT group.

4.2.2 Statistical analysis:

The non-parametric Kruskal–Wallis test was used to compare the mean percentages of leakage between 2 different types of post and RCT group. As seen in Table 4.7 and Figure 4.2, the results indicated that there is a significant difference in microleakage between Fiber Lux ParaPost and ParaPost XH and RCT group ($p= 0.005$).

Table 4.7 Comparison of coronal microleakage between 2 different post systems and RCT.

Group	N	Median (IQR)	P value#
Fiber Lux ParaPost	30	0.58 (1.35)	0.005*
ParaPost XH	30	1.27 (1.72)	
RCT	10	1.38 (2.260)	

#Kruskal–Wallis test
 * Significant p<0.05

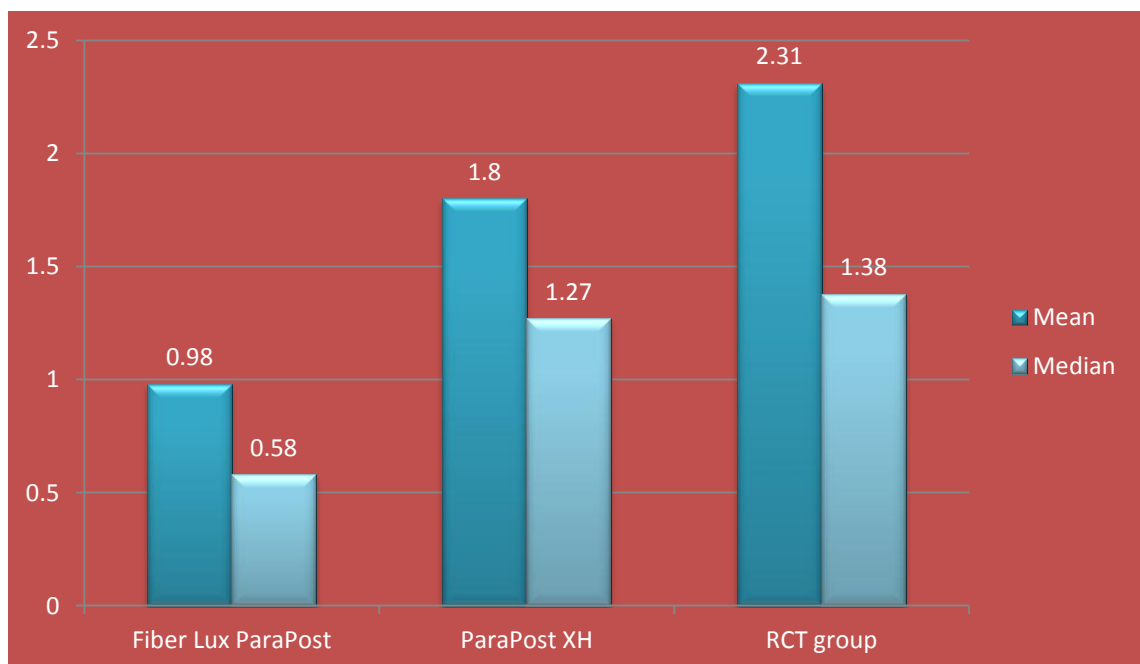


Figure 4.2 Comparison of coronal microleakage (%) between 2 different types of post and RCT.

Due to the significant nature of the result, Mann–Whitney U test was done for pairwise comparison. Results are shown in Table 4.8.

Table 4.8 Pairwise comparison of microleakage between different types of post and RCT

	ParaPost XH	RCT
Fiber Lux ParaPost	0.018*	0.03*
ParaPost XH		0.8

* Significant $p < 0.05$

Pairwise comparison showed that significant difference in microleakage was found between Fiber Lux ParaPost (fiber post) and ParaPost XH (titanium post) $p = 0.018$. In addition to that, there was also significant difference in microleakage between the Fiber Lux ParaPost and the RCT group $p = 0.03$.