

CHAPTER IV

RESULTS

As seen in table III, the presence of ferrule approximately doubled the fracture resistance compared to teeth without ferrule, irrespective of the fit of the post. These differences were statistically significant. In teeth prepared with ferrule, the presence of a smaller post reduced the fracture resistance by approximately 10%, but this was not statistically significant. In teeth with no ferrule, a smaller post reduced the fracture resistance by about 20%, which was also not statistically significant (table III).

Table III Mean and standard deviation of fracture resistance force of tooth specimens with different remaining tooth structure and post diameters

		Mean \pm SD (N)	
		Ferrule	No ferrule
Post diameter	Properly fit	1474.67 \pm 285.49 ^a	811.67 \pm 155.71 ^b
	Smaller	1339.42 \pm 120.59 ^a	668.47 \pm 170.24 ^b

Mean values with the same superscript letters are not statistically significant different ($p>0.05$)

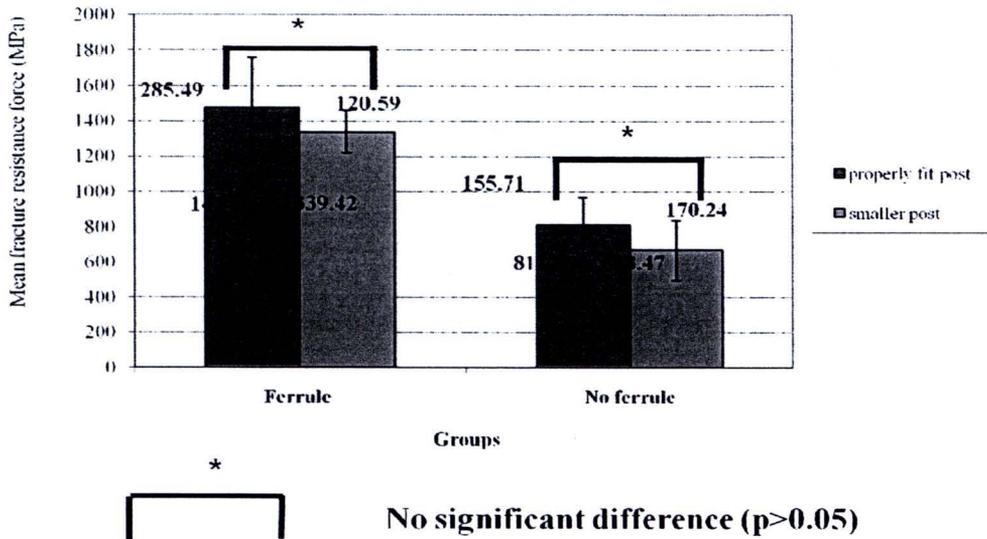


Fig. 10 Mean fracture resistance force of tooth specimen with different tooth structure and post diameters

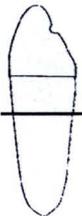
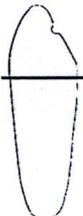
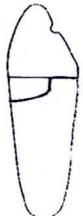
Two-way ANOVA revealed significant effects of the teeth with or with no ferrule in fracture resistance ($p < 0.05$) (Table IV), but the diameter of post did not affect fracture resistance. Different post sizes had no effect ($p > 0.05$). An interaction effect between these variable was not found ($p > 0.05$).

Table IV Two-way ANOVA for effects and interactions of ferrule preparation and diameter of post

	df	Sum of Squares	Mean Square	F	Sig.
Ferrule	1	3558825.196	3558825.196	95.363	.000
Post diameter	1	155061.844	155061.844	4.155	.051
Ferrule * Post diameter	1	126.683	126.683	.003	.954

Three modes of failure were observed, horizontal root fracture at cervical root, horizontal fracture at crown margin and debonding of margin combined with cervical root fracture as described in table V. In groups with ferrule (groups 1 and 2), the failure mode was horizontal root fracture at the cervical of root or debonding of margin combined with cervical root fracture. In groups with no ferrule (groups 3 and 4), the failure mode was observed all 3 patterns.

Table V Distribution of different modes of failure of four experiment groups

	Horizontal root fracture at cervical of root	Horizontal fracture at crown margin	Debonding of margin combined with cervical root fracture
			
Group 1 (ferrule+ properly fit)	3	0	5
Group 2 (ferrule+ smaller post)	7	0	1
Group 3 (no ferrule+ properly fit)	1	4	3
Group 4 (no ferrule+ smaller post)	3	3	2
Total	14	7	11

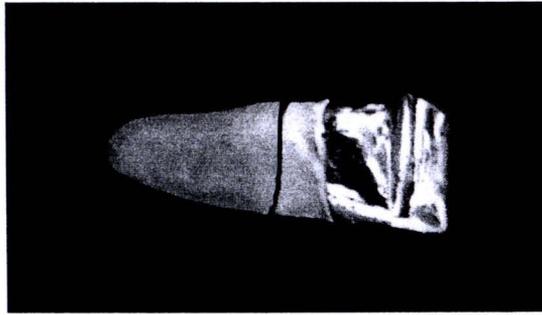


Fig. 11 Fracture mode of specimen which was horizontal root fracture at cervical of root



Fig. 12 Fracture mode of specimen which was horizontal root fracture at crown margin

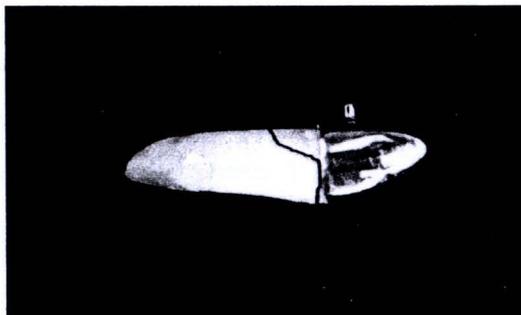


Fig. 13 Fracture mode of specimen which was debonding of margin combined with cervical root fracture