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FATIGUE FAILURE MODE OF PORCELAIN VENEERS WITH DIFFERENT PREPARATION DESIGNS

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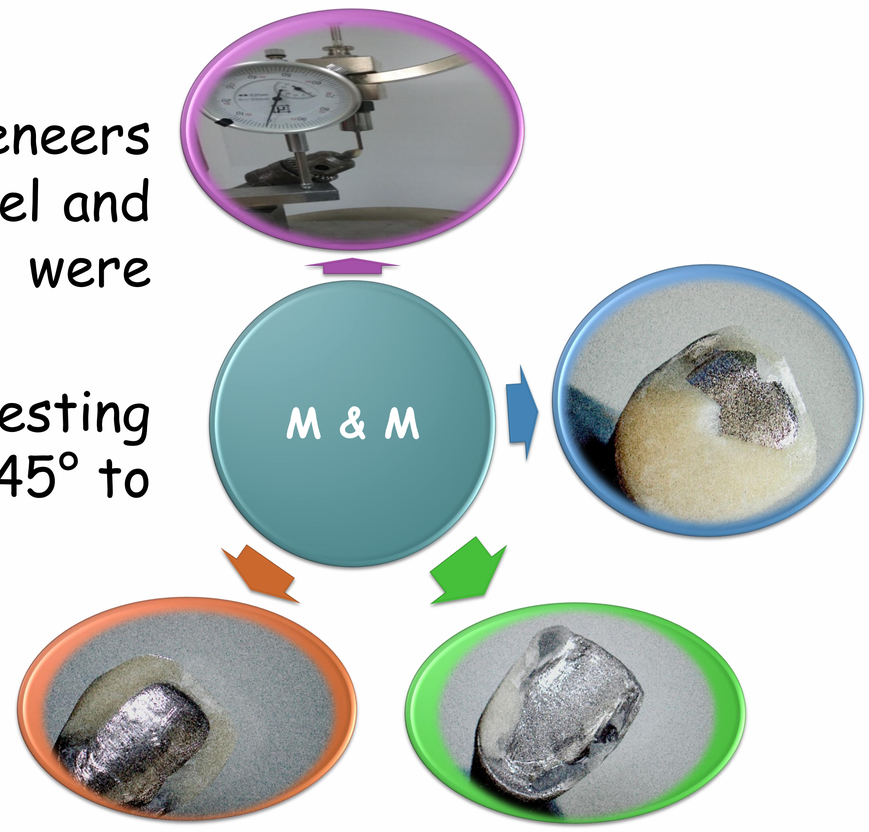
Introduction: Due to high aesthetic qualities, proven biocompatibility and prognosis for long term durability, porcelain veneers have become a routine restorative procedure for treatment of frontal teeth. The aim of this in vitro study was to examine the influence of the preparation designs on the fatigue failure of porcelain veneers.

Material and Methods: In this in vitro study porcelain veneers with three different types of preparation design – feather, bevel and incisal overlap – palatal chamfer were analyzed. The veneers were made on maxillary central incisor by refractory die technique.

The samples from all three groups were loaded to failure in a testing machine TRITECH WF 10056. The force was applied at angle of 45° to the long axis of the tooth, with constant speed of 0,5 mm/min.

The mode of failure was determined as debonding or fracture. The data were statistically analyzed using statistical program Statistica 7.1; SPSS17.0.



Results: In feather preparation as a consequence of mechanical strength, fracture is registered in 20.0% of samples and debonding at 80.0%. In bevel preparation fracture is register in 93.3% and debonding in 6.7%. In incisal overlap – palatal chamfer due to mechanical strength is registered fracture in 96.7% and debonding in 3.3%. The percentage difference between the registered mode of failure – fracture against debonding between the groups according to Difference test was statistically significant between group I against group II, and I against III group, for $p<0.05$ ($p=0.0438$).

Fatigue failure mode	I group		II group		III group	
	N	%	N	%	N	%
Fracture	6	20.0	28	93.3	29	96.7
Debonding	24	80.0	2	6.7	1	3.3
Total	30	100.0	30	100.0	30	100.0

1* - Fracture2* - Debonding

	Average – 1*	Average – 2*	Number - 1*	Number - 2*	Stand. dev. – 1*	Stand. dev. – 2*
Group I	196.0667	138.7833	6	24	21.92092	33.38217
Group II	195.3036	157.2500	28	2	44.66828	63.99316
Group III	249.2069	176.7000	29	1	49.48555	0.00

Conclusion: The most common fatigue failure in porcelain veneers with feather preparation is debonding, while in other preparation designs fracture dominates.