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48 Months Clinical Outcomes of Composite Restorations with Cavity Lining

#0497

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Introduction

Marginal/internal leakage, which is ultimately an immediate failure in composite restorations, is often caused by inadequate primary adaptation of the restorative material to the respective cavity walls. In order to avoid these defects, especially in the posterior region, the idea of using flowable composite as liner emerged[1-5].

Objectives

The aim of this randomized, split-mouth-designed controlled and single-blind clinical study was to evaluate the 3-year clinical performance of Class I and Class II resin composite restorations placed with or without cavity lining with a high viscosity flowable.

Methods

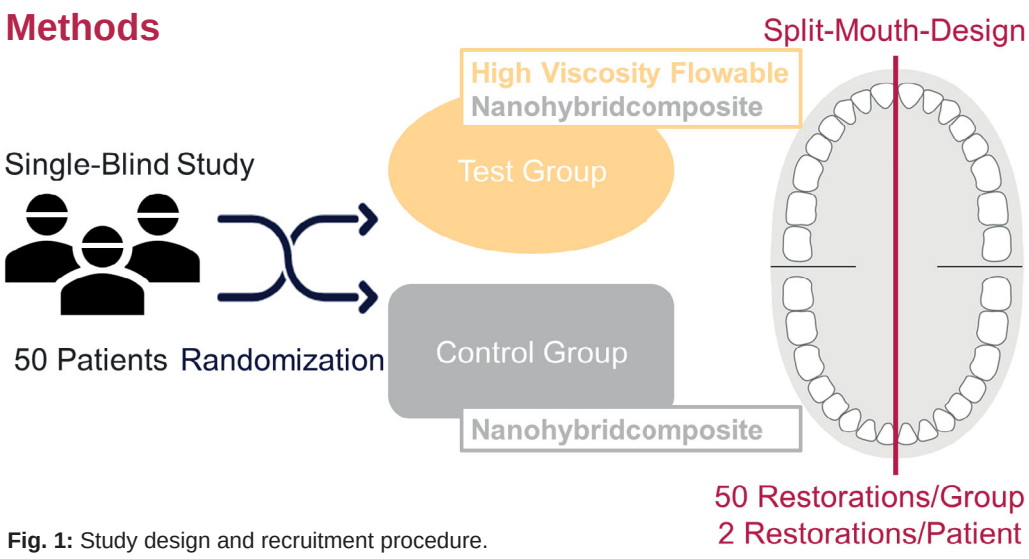

Fig. 1: Study design and recruitment procedure.

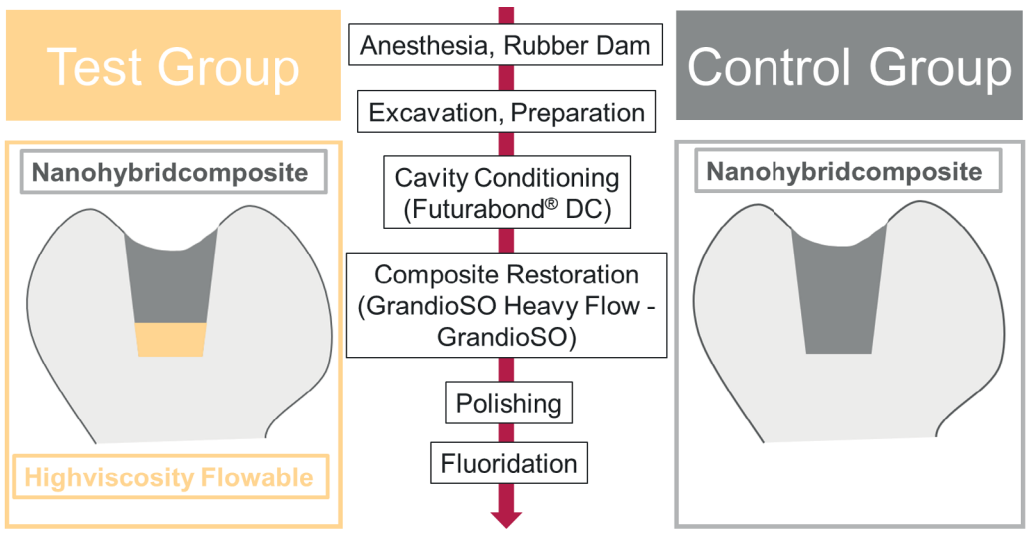

Fig. 2: Clinical procedure, materials and methods.

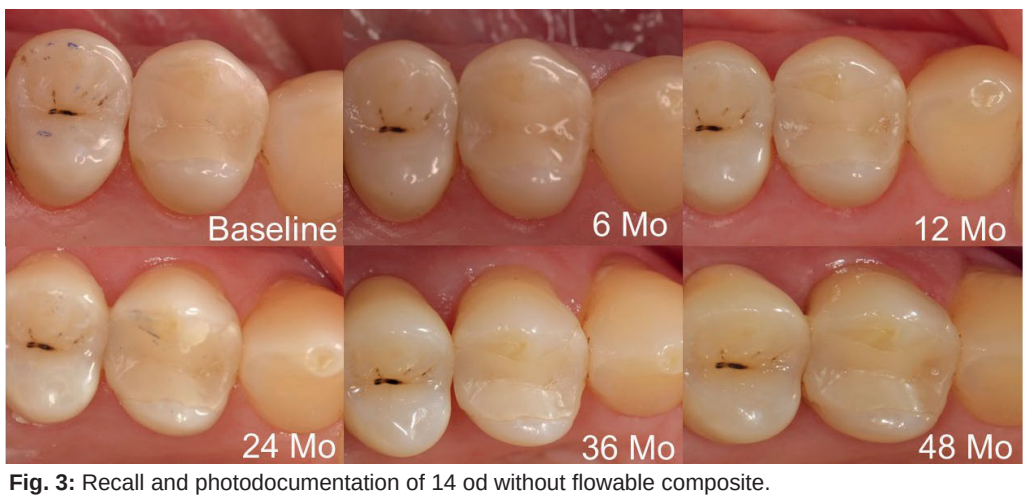

Fig. 3: Recall and photodocumentation of 14 od without flowable composite.

Results

Parameter	Control Group				Test Group			
Interval	Baseline	24-months follow-up	36-months follow-up	48-months follow-up	Baseline	24-months follow-up	36-months follow-up	48-months follow-up
Secondary caries	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0
Tooth vitality	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0	50/0/0/0	44/0/0/3	43/0/0/3	40/0/0/3
Postoperative sensitivity	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0
Filling integrity/fracture	50/0/0/0	47/0/0/0	46/0/0/0	41/0/0/2	50/0/0/0	45/2/0/0	44/1/1/0	40/1/1/1
Proximal contact	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0
Surface roughness	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0	50/0/0/0	47/0/0/0	46/0/0/0	43/0/0/0
Marginal adaption	50/0/0/0	47/0/0/0	45/1/0/0	41/2/0/0	50/0/0/0	46/1/0/0	44/2/0/0	40/3/0/0
Marginal discoloration	50/0/0/0	45/2/0/0	41/5/0/0	38/5/0/0	50/0/0/0	44/3/0/0	43/3/0/0	39/4/0/0
Color match	50/0/0/0	47/0/0/0	46/0/0/0	40/3/0/0	50/0/0/0	47/0/0/0	46/0/0/0	40/3/0/0
n assessed	50	47	46	43	50	47	46	43
recall rate (%)	100	94	92	86	100	94	92	86
n failure (cumulative failure%)	0 (0%)	0 (0%)	0 (0%)	2 (4%)	0	3 (6,0%)	4 (8%)	5 (10%)
AFR (%)	0%	0%	0%	1,0 %	0%	3,0%	2,7%	2,5%

Fig. 4: Summary of the parameters evaluated according to the modified USPHS/Ryge criteria[1].

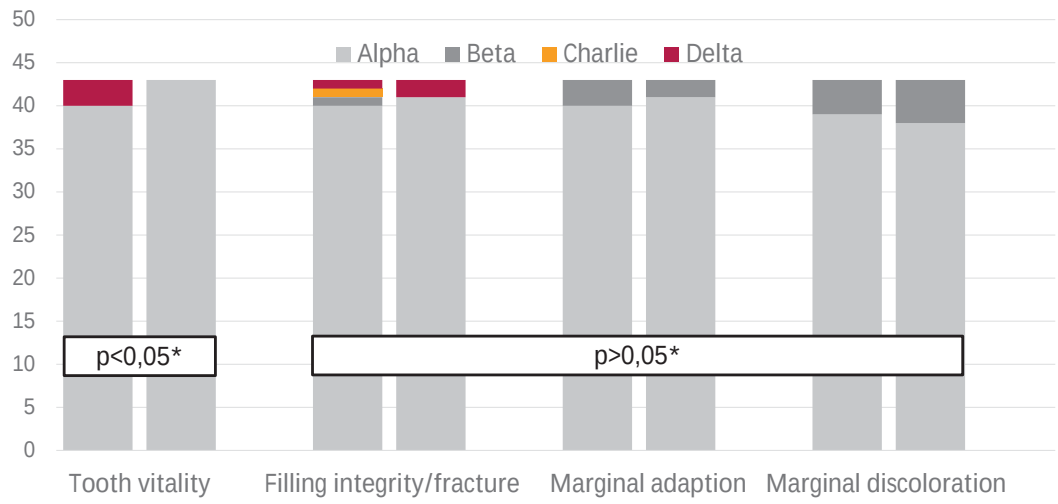

Fig. 5: Test group vs. control group (*significant difference p<0.05, Mann-Whitney U-test).

Conclusions

With regard to the effects of the cavity lining, the results of the test group using a flowable composite ultimately led to a significantly increased annual failure rate (AFR) of 2.9% compared to 0% in the control group (p<0.05; Mann-Whitney U test). Apart from the differences in tooth vitality, success rate, marginal discoloration and AFR, no significant effects of the flowable composite on the other parameters were found. The additional application of a flowable composite did not tend to be superior in this trial and should be further evaluated over an even longer period of time.

References

[1]Ryge, G. Clinical criteria. Int Dent J 1980;30:347-358.

[2]Ryge, G.; Snyder, M. Evaluating the clinical quality of restorations. J Am Dent Assoc 1973;87:369-377.

[3]Gernhardt CR, Nguyen AD, Michaelis M, Pütz N. Clinical Outcome of Class I and II Restorations with and without an Intermediary Layer of a Flowable Composite after 24 Months: A Prospective, Randomized, Split-Mouth-Designed, Controlled and Single-Blinded Clinical Trial. Appl Sci 2023;13:4224.

[4]Aggarwal V, Singla M, Yadav S, Yadav H. Effect of flowable composite liner and glass ionomer liner on class II gingival marginal adaptation of direct composite restorations with different bonding strategies. J Dent 2014;42:619-625.

[5]Al Sunbul, N. Silikas, D.C. Watts. Polymerization shrinkage kinetics and shrinkage-stress in dental resin-composites, Dent Mater 2016;32: 998-1006.

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