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F. Karut, J. Abdine

MICROLEAKAGE AROUND CLASS V RESTORATIONS AFTER ULTRASONIC SCALING: A COMPARATIVE STUDY

Tutor: senior lecturer K.Y. Pstyga
Department of Conservative Dentistry
Belarusian State Medical University, Minsk

Resume. Oral hygiene is a critical component in maintaining the health of the oral cavity, with professional interventions playing a significant role in preventing dental diseases. Among these interventions, ultrasonic scaling has become a widely adopted technique due to its efficiency in plaque removal and periodontal therapy. However, the use of ultrasonic instruments presents unique challenges, particularly when interacting with dental restorations, especially Class V restorations, which are often subjected to the forces of ultrasonic vibration. The contact of ultrasonic scalers with these restorations can potentially compromise their longevity and effectiveness.

Keywords: ultrasonic scaling, composite, GIC, restoration border, staining, micro- cracks, chips, micro leakage, cavity class V.

Relevance. Studies have shown that the manipulation of restorative materials under ultrasonic influence may lead to alterations at the margins, contributing to microleakage and subsequent secondary caries [1, 3]. As we explore the intersection of ultrasonic scaling and restorative dentistry, it is imperative to understand the implications of these interactions on patient outcomes and the longevity of restorations [2, 4]. This research aims to provide insights into optimizing ultrasonic scaling techniques to preserve the integrity of Class V restorations while ensuring effective oral hygiene practices. However, there is not enough reasoned and scientifically based data on the effect of various ultrasonic vibrations on restorative materials and structures, as well as a comparison of different filling materials used in cervical area of the tooth. All of the above served as the basis for the study, defined the goal and objectives.

Aim: to evaluate the effect of ultrasonic scaling on the marginal microleakage around Class V restorations comparing the various materials used for this goal.

Objectives: assessment of the marginal leakage of composite under normal and excessive pressure by using a staining agent; comparison of different types of filling materials (composites and GIC).

Materials and methods. 32 Extracted teeth with class V cavities were selected for the stud (img. 1), prepared with diamond and carbine burs, turbine ana angle handpeice, etched and bonded (img. 2). Each 4 samples were filled with one of the filling materials showed in (img. 3), polished with rubber cups and polishing discs (img. 4). Teeth were marked before any manipulation and pictures were taken, subjected to a load of ultrasonic scaling (30 sec) and aggressive scaling while a caries marker was used after each process. The samples were photographed with a macro lens camera for further visual evaluation of the results.

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Fig. 1 – Prepared teeth

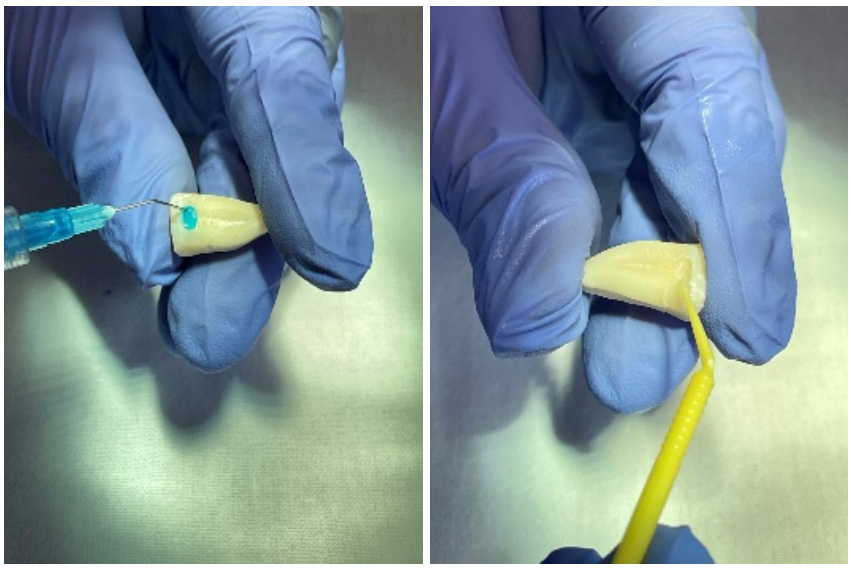

Fig. 2 – Etching and bonding

Fig. 3 – Materials used

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Fig. 4 – Finishing and polishing

Results and their discussion.

Tbl. 1. Table showing the results of microcracks in all groups of different filling materials

Materials	After 30sec scaling	After excessive scaling (45sec, forcful)
Gradia GC	0/4	1/4
Bulk SDR+	0/4	1/4
Denfil flowable	0/4	1/4
Denfil regular	0/4	1/4
Gaenial	1/4	1/4
T-econom plus	1/4	2/4
Escom 250	1/4	2/4
GIC vitremer	3/4	4/4
Total	6/32=18.75%	13/32=40.6%

18.75% of cases had microcracks after 30 sec manipulation;
50% GIC Vitremer (img. 5);
16.6% Gaenial, Escom 250 & T econom plus (img. 6);
40.6% Of cases got microcracks after excessive scaling;
30% GIC vitremer;
15.3%T econom plus (img. 8) and Escom 250 (img. 9).

Gradia GC, Bulk SDR+ (img. 7) and Denfil (img. 10) have the greatest tolerance under excessive force, minimal microleakage. GIC vitremer has Minimal tolerance and great risk of microleakage. Gaenial, EsCom 250 & T econom+ have Moderate tolerance, presence of risk of microcracks.

Fig. 5 – GIC vitremer

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Fig. 6 – Geanial

Fig. 7 – Bulk SDR

Fig. 8 – T econom+

Fig. 9 – Escom 250

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Fig. 10 – Regular denfill

Conclusion:

1. Ultrasonic scaling has a direct effect on the microleakage around Class v restorations.
2. 30 sec of scaling is more than enough per surface area.
3. 20 sec of scaling with sliding soft motions is a golden Standard for Ultrasonic scaling.
4. The materials cost and high esthetics doesn't necessarily mean more strength.
5. The practioner's manual skills overcomes the weak points of a restorative material but still can subside its attributes.

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