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Droplet Spread Pattern Produced by Magnetostrictive Scaling with and without a High-volume Evacuator

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Abstract

Objectives: To study the droplet spread pattern from magnetostrictive scaling and the effect of a high-volume evacuator (HVE) on spread reduction.

Methods: Magnetostrictive scaling was simulated on a dental unit using dye-stained water. Gridded filter paper was installed at five vertical heights. Each height consisted of a center point with six radial directions, each divided into four horizontal distances. Eight minutes of scaling was performed in triplicate for two groups, scaling with HVE (H) and scaling without HVE (NH). The stained paper grid cells were counted, and the number and percentage of stained cells were calculated. Statistical comparison of H and NH was performed using SPSS.

Results: The 2 and 4 o'clock directions showed the highest number of stained areas in both groups. Pieces of paper located 30 cm from center horizontally in all directions from floor level up to 30 cm above the scaler tip were completely stained in both groups. The furthest distance that droplets spread was 120 cm from center at 2 and 4 o'clock in the NH group. The highest vertical spread was 45 cm above the tip in both groups and it was significantly decreased in the H group. The total stained area was reduced by 3.15% when using HVE.

Conclusions: Droplet spread from magnetostrictive scaling can reach 120 cm from the dental unit in the 2 and 4 o'clock directions. An HVE with adequate airflow rates is necessary for reducing contamination risk.

Keywords: high-volume evacuator, scaling droplets, spread pattern, ultrasonic scaler