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Cleaning Splints' Clinical Performance on Plaque and Inflammation Parameters

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Objectives In daily clinical practice, patients still find it difficult to achieve optimal oral hygiene. Especially interdental spaces continue to be problematic, as many patients find effective interdental brushes (IDBs) cumbersome and difficult to use. The aim of this study is to investigate effectiveness of plaque removal using individually manufactured cleaning splints as support for IDBs.

Methods 16 subjects with periodontal disease and varying residual dentition/prosthetic restoration status were included in an ongoing randomized controlled clinical trial in parallel cross-over design. In the first session, impressions were taken and an individual fitting of IDBs was performed. Thereafter, cleaning splints were digitally designed for each patient. Design included grooves in the proximal area to facilitate insertion and guide surfaces to improve effect of IDBs. Splints were produced using 3D printing. To equilibrate interdental plaque indices, a standardized oral hygiene protocol was established, including suspension of interdental cleaning for 2 weeks. Thereafter, two parallel groups either performed normal oral hygiene without a cleaning splint (Group 1) or used IDBs with the aid of the cleaning splint for 2 weeks (Group 2). After a 2-week washout period Group 1 started using the cleaning splint and Group 2 performed interdental cleaning without the splint. Oral hygiene indices (Quigley Hein Plaque-Index QHI; Gingiva Index GI) were recorded before and after each 2 week-cleaning period. The statistical analysis was carried out using SPSS.

Results Initial value of the QHI was between 3.14 and 3.6. After application of the cleaning splint, QHI decreased significantly ($\Delta QHI1=-0.16$; $\Delta QHI2=-2.00$; $p>0.001$). However, there were no effects on the GI ($\Delta GI1=0.00$; $\Delta GI2=-0.07$).

Conclusions Within limitations of this study, the investigated cleaning splint beneficially affected plaque reduction, while there was no short-term effect on gingival inflammation. Using cleaning splints could be a promising approach to increase the effect of IDBs on plaque reduction.