

## One-step and no-prep treatment of worn dentition using PICNs. A prospective clinical study

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**INTRODUCTION:** Computer-Aided Design and Manufacturing (CAD-CAM) composite materials offer new possibilities in terms of minimally invasive treatment strategies of worn dentition. Among those materials, Polymer Infiltrated Ceramic Network (PICN) materials, (Vita Enamic, Vita Zahnfabrik, Bad Sackingen, Germany) exhibit mechanical properties significantly superior to conventional composites<sup>1</sup>. Their ability to be milled in very low thickness allows to perform very thin bonded restorations without further elimination of tooth tissues (no-prep). Yet, the treatment is complex particularly with respect to the provisional restoration realization, which is intended to test and determine the new vertical dimension of occlusion (VDO). On the other hand, some authors have previously reported that VDO determination remains empirical and that it can be increased in one time up to 5mm (in the front zone) without engendering any adverse effects. Therefore, the objective of the present study is to evaluate a new treatment approach of worn dentition using PICNs, entitled “One step-No prep”.

**METHODS:** Study enrolled 7 patients (mean age: 37.7 years) with a severe tooth wear (BEWE score >13). Etiology of tooth wear was determined by a closed questionnaire and a full diagnosis of temporo-mandibular disorders (TMD). Then, an occlusal analysis and a full-mouth wax-up on plaster casts were performed. PICN restorations were bonded on non-prepared teeth, with respect to the initial wax-up. Restorations (n=192) were placed during two consecutive visits within 24 hours. Buccal direct composites were performed later on incisors to mask the limit between the palatal veneer and the buccal tooth face. Patients with a TDM disorder were treated by a specialist. Restorations were clinically evaluated after 1

week, 1 and 6 months following the criteria of the World Dental Federation (FDI). Patient centered outcomes were assessed using questionnaires such as OHIP-49.



Fig 1. Typical PICN posterior restoration and clinical views before and after treatment

**RESULTS:** Tooth wear was mainly attributed to chemical erosion (sodas) and bruxism and loss of tissue was higher than 50% on most teeth. Mean VDO loss, as estimated with the wax-up, was  $5.09 \pm 0.85$  mm on the front teeth. The minimal restoration thickness was 0.17 mm. The survival and the success rates of restorations reached 100%. A high satisfaction rate of patients with the whole procedure, the functional and esthetic results, the restorative material and the absence of provisional restorations was observed. However; 43% of patients was unsatisfied about the appointments related to the bonding procedure. The treatment showed a significantly positive effect on pain (muscular, articular, tooth), posture, as on the psychological well-being.

**DISCUSSION & CONCLUSIONS:** The One step- No prep approach is very promising. The technique is particularly minimally invasive, straightforward, cost-effective and was highly appreciated by the patient. However, further clinical research should be done in order to validate such a protocol in routine practice, particularly exploring the long-term behavior of PICN restorations in terms of wear.

**References:** <sup>1</sup> Coldea, A., Swain, M.V., Thiel, N. et al. (2013) *Dental materials*, 29(4): 419-26.