

## Effect of Low Abrasive Airpolishing on the Gingiva using an *Ex Vivo* Porcine Model

### 35 **Abstract**

*Objectives:* To establish and evaluate an ex-vivo porcine model to investigate the influence of different modes of periodontal instrumentation on the surrounding soft tissue.

*Material and Methods:* In each of 120 pig mandibles, one molar tooth was chosen at random and its root surface instrumented. 30 teeth in 30 other pig mandibles served as untreated  
40 control. For debridement, two different low abrasive airpolishing powders (Glycine Powder  $d_{90}=25\ \mu\text{m}$ , Erythritol Powder  $d_{90}=14\ \mu\text{m}$ ), as well as Gracey Curets and a piezoelectric ultrasonic scaler were used. Gingival biopsies were taken and histologically assessed for destruction using a four graded scale. Statistical analysis was performed in a descriptive manner.

45 *Results:* The porcine model was deemed suitable for the planned investigation. Hand instrumentation and ultrasonic scaling caused higher tissue damage than both low abrasive airpolishing modes (Fisher's exact test,  $p=0.0025$ ). Erythritol powder led to less, yet non statistical noticeable gingival changes compared to glycine based powder (Fisher's exact test,  $p=0.39$ )

50 *Conclusion:* For histological observation of soft tissue damage following periodontal debridement, an ex-vivo porcine model may be used within its limitations. As regards the immediate effects on gingival tissue, airpolishing using glycine and erythritol powder may be considered safe.

55 **Clinical Relevance**

*Scientific Rationale:* In recent years, numerous powders for low abrasive airpolishing (LAA) technique have been developed and it may be expected that additional products will follow. To avoid gingival damage, histological observations of gingival tissue after LAA are useful.

60 *Principal findings:* An ex-vivo porcine model is suitable for evaluating the immediate influence of LAA on gingiva.

*Practical Implications:* For debridement, LAA using Erythritol- or Glycine based powders may be used safely. The chosen ex-vivo model may be suitable for further studies.