

**PRESENTER (COUNTRY ONLY):** Netherlands

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**TITLE:** The microbiome of endodontic infections and its association with clinical features

**ABSTRACT BODY:**

**Objectives:** To describe the endodontic infection of teeth with primary and secondary apical periodontitis and explore differences related to symptomatology.

**Methods:** Twenty-nine teeth with primary or secondary apical periodontitis were extracted and cryo-pulverized. Amplicons based on the V4 hypervariable region of the 16S rRNA gene were sequenced using Illumina MiSeq. The data was processed in line with the UPARSE pipeline and subsampled at equal depth (6400 reads/sample). The microbiome profiles were ordinated using Principal Component Analysis (PCA), and tested for differences between groups with permutational multivariate analysis of variance (PERMANOVA) using the Bray-Curtis distance. If significantly different, the microbial profiles were further analyzed using the LDA effect size biomarker (LEfSe) discovery tool.

**Results:** The 334 thousand sequences that passed quality filtering were clustered into 276 Operational Taxonomic Units (OTUs) and classified into 126 genera or higher taxa. The predominant genus in the entire sample set was Fusobacterium. The microbiomes of the endodontic infections were significantly associated with endodontic status (primary/secondary infection) ( $F=2.2$ ,  $P=0.015$ ) as well as with the presence or absence of pain ( $F=2.3$ ,  $P=0.013$ ). There were no associations between gender and microbiome or gender and the presence or absence of pain. The relative abundance of several OTUs differed based on pain existence. For example, Streptococcus, Prevotella 7 and Bifidobacterium were more abundant in asymptomatic, while Fretibacterium, and Peptostreptococcus in symptomatic apical periodontitis. The Streptococcus OTU was further identified as *S. mutans* and even was the second most abundant OTU in the asymptomatic group. Secondary apical periodontitis showed a higher relative abundance of e.g. a Tannerella and Mogibacterium OTU.

**Conclusions:** The microbial profile of primary endodontic infection differed from that of secondary. The presence or absence of pain in apical periodontitis was related to the microbial ecology of the root canal. These results should be taken into consideration in future treatment strategies.

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