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Tertiary Lymphoid Structures in Severe Periodontitis Patients: Preliminary Results

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Objectives Tertiary lymphoid structures (TLSs) are ectopically organized lymphoid tissues that drive immune responses in chronic inflammation. They develop in perivascular areas comprising of high endothelial venules (HEVs) and lymphatic vessels, together with cell aggregates of B and T-cells. The presumed influence of TLSs on the disease course has led to widespread interest in understanding their biology and function. We aimed to investigate the presence of TLSs in severe periodontitis lesions.

Methods Gingival tissues were obtained from periodontitis patients referred to the specialist clinic at Oral Health Centre of Expertise, Western Norway. The study was approved by the Regional Committee for Medical Research Ethics in Norway, 2017/1650/REK.

The patients included in this study were four males (1 smoker, 3 non-smokers) and one female (smoker), aged 19-73 years. All participants had completed a hygienic phase of therapy with a remaining pocket depth \geq 5mm, before surgical treatment. Gingival tissue excised during surgery was formalin fixed and immunohistochemical analysis was performed on serial paraffin sections. Antibodies used were rabbit anti-CD3 (T-cells), mouse anti-CD20 (B-cells), rat anti-MECA-79 (HEVs) and mouse anti-Podoplanin D2-40 (lymphatic endothelium (LEC)). Triple-enzymatic immunohistochemistry staining was used, in addition to single staining of LEC in neighbor sections.

Results TLSs were found in gingival tissue sections of 3 participants (2 males, nonsmokers and one female, smoker). Podoplanin⁺ lymphatic vessels were found within and in the periphery of the immune cell aggregates along with HEVs. In 2 patients (1 smoker, 1 non-smoker) no TLSs were identified.

Conclusions This study revealed the presence of TLSs in severe periodontitis cases. Analysis of more patients and the comparison with healthy controls are needed to identify the prevalence of TLSs in periodontitis patients and to understand the association of TLSs and periodontitis treatment outcomes.