State of the art in Vocal Folds Optical Coherence Tomography

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In 1991, Huang et al. described the use of Optical Coherence Tomography (OCT) for biological tissue analysis[1]. OCT is an imaging technique based on the interference of two beams of broadband radiation from a reference arm and a sample arm[1]. To achieve Ultra- High- Resolution in OCT the components play a significant role, where the *superluminescent diodes* are crucial[2]. For the oral cavity, the UHR-OCT has shown more exact results based on operating wavelength (nm) 1305 for OCT, versus 1270 (1070-1470) for UHR-OCT[3].

With the right probe, it is possible in vivo to see the layers in the nose and pharynx with OCT which is very interesting in pathology, this is also the case for the course of infections as shown in oral mucosa[4]. With Deep-Learning it is possible automatically in vivo to detect benign/unclear and malignant tissues on the vocal folds in vivo which is also the case with the effect of laser ablations on the vocal folds.

As for studies of the vocal folds, 250 fps can be shown with movements of the vocal fold. It is possible to define the epithelium and the lamina propria. The authors found a size during the resting state for the epithelium state, in males 106 ± 49 µm, and the lamina propria 367 ± 197 µm. In females: 66 ± 24 µm and 595 ± 179 µm respectively. During phonation, the epithelium state was in males 81 ± 35 µm, and the lamina propria 376 ± 130 µm. In females:79 ± 38 µm and 522 ± 220 µm respectively. The amplitude movements of the vocal folds were also measurable[5].

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