

# Visualisation with Amira™ of internal structures of life objects obtained by Optical coherence tomography (Amira™を用いた OCT による光生体断層画像の可視化)

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目的 : Analysis of internal structures of oral dental tissues to diagnose early caries and periodontal disease

方法 : Optical coherence tomography OCT is an interference optical method based on the detection of backscattered light, which can provide high-resolution whole-field images of biological tissues. The advantage of OCT method is that it can provide *in-vivo* imaging. Fiber based Fourier Domain Optical Coherence Tomography (SD-OCT) systems for dental measurements is demonstrated. Wavelength scanning laser at center wavelength of 1.3  $\mu\text{m}$ , wavelength range of 110 nm with scanning rate of 20 KHz were used as light sources. The systems can acquire three dimensional (3-D) images in the range of several second with high sensitivity ranging from 100 to 108 dB. *In-vivo* measurements of human teeth were carried out and the ability of the systems to detect under enamel caries was demonstrated. In addition, *in-vivo* measurements of tooth and mucosa junction were performed and the system proved to be potentially useful in diagnostics of periodontal diseases. The 3-D volume data were rendered using Amira™ for volume data visualisation.

結果 :

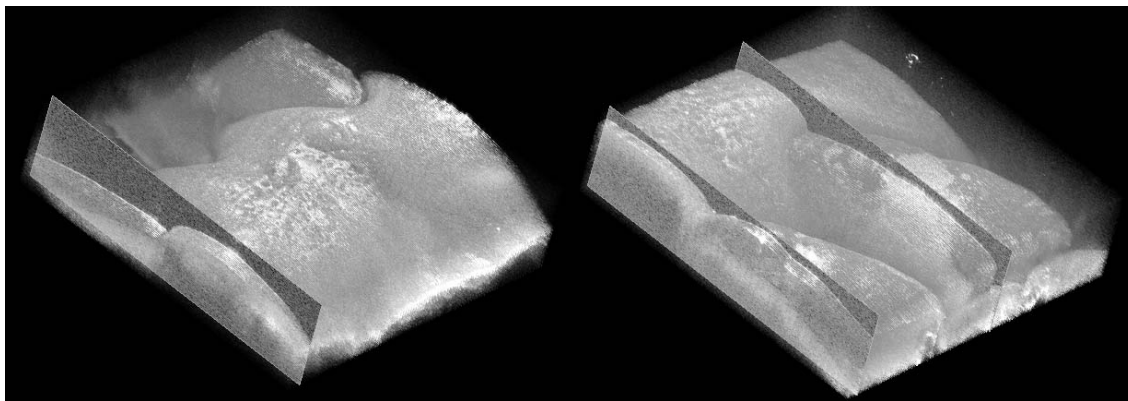


Figure 1 Volume rendered data. (a) Human gingival tissue; (b) human tooth with resin filling

結論 : With the help of the Amira™ product, it is possible to visualise minute features inside tissues. Since the product also permits various post-processing techniques, such as, for example, skeletonising, noise filtering, cross-sectioning in arbitrary direction, it is very useful and valuable tool.