EX-VIVO IMAGING OF THE NATIVE NON-FROZEN SAMPLES ATHEROSCLEROTIC PLAQUES

BY HIGH RESOLUTION X-RAY COMPUTED TOMOGRAPHY

Purpose: The purpose of this study was to evaluate the potential of this type of detectors for X-ray imaging of atherosclerotic lesion under experimental conditions.

Description of the method: The X-ray microtomograph MARS (Medical Imaging Systems Ltd.) is a hybrid X-ray detector designed for high-resolution imaging of small samples (less than 1 cm in diameter) with complex material composition. The device is equipped with two types of detectors: one for soft X-rays (up to 30 keV) and the other for hard X-rays (up to 80 keV). The radiographic resolution is 50 microns, which is three times better than that achieved by traditional X-ray tomographs. The detector is a hybrid pixel and sensor fabricated on the basis of ionization detectors based on gallium arsenide and CdTe, which gives an extremely good spatial resolution and an ability to distinguish different material components in the sample.

Results: Initial studies showed that the MARS device allows for high-resolution imaging of small samples, which is not possible with traditional X-ray devices. The material composition of the samples is determined by analyzing the spectrum of X-rays emitted by the sample.

Conclusions: The MARS device provides a new way of visualizing atherosclerotic plaques and could be used for the development of new medical devices for the treatment of cardiovascular diseases. The device is simple to use and provides high-quality images, which can be used for the development of new medical devices for the treatment of cardiovascular diseases.