

Intra-tissue pressure measurement in ex vivo liver undergoing laser ablation with fiber-optic fabry-perot probe

Daniele Tosi, Paola Saccomandi, Emiliano Schena, Dinesh Babu Duraibabu, Sven Poeggel, Gabriel Leen, Elfed Lewis

- School of Engineering

Abstract

We report the first-ever intra-tissue pressure measurement performed during 1064 nm laser ablation (LA) of an ex vivo porcine liver. Pressure detection has been performed with a biocompatible, all-glass, temperature-insensitive Extrinsic Fabry-Perot Interferometry (EFPI) miniature probe; the proposed methodology mimics in-vivo treatment. Four experiments have been performed, positioning the probe at different positions from the laser applicator tip (from 0.5 mm to 5 mm). Pressure levels increase during ablation time, and decrease with distance from applicator tip: the recorded peak parenchymal pressure levels range from 1.9 kPa to 71.6 kPa. Different pressure evolutions have been recorded, as pressure rises earlier in proximity of the tip. The present study is the first investigation of parenchymal pressure detection in liver undergoing LA: the successful detection of intra-tissue pressure may be a key asset for improving LA, as pressure levels have been correlated to scattered recurrences of tumors by different studies.

Original language	English
Article number	544
Journal	<u>Sensors (Switzerland)</u>
Volume	16
Issue number	4
State	Published - Apr 15 2016

Tosi, D., Saccomandi, P., Schena, E., Duraibabu, D. B., Poeggel, S., Leen, G., & Lewis, E. (2016). *Intra-tissue pressure measurement in ex vivo liver undergoing laser ablation with fiber-optic fabry-perot probe*. *Sensors (Switzerland)*, 16(4), [544]. DOI: 10.3390/s16040544