Potential of contrast agents to enhance in vivo confocal microscopy and optical coherence tomography in dermatology - DTU Orbit (08/11/2019)

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Distinction between normal skin and pathology can be a diagnostic challenge. This systematic review summarizes how various contrast agents, either topically delivered or injected into the skin, affect distinction between skin disease and normal skin when imaged by optical coherence tomography (OCT) and confocal microscopy (CM). A systematic review of in vivo OCT and CM studies using exogenous contrast agents on healthy human skin or skin disease was performed. In total, nine CM studies and one OCT study were eligible. Four contrast agents aluminum chloride (AlCl) n = 2, indocyanine green (ICG) n = 3, sodium fluorescein n = 3 and acetic acid n = 1 applied to CM in variety of skin diseases. ICG, acetic acid and AlCl showed promise to increase contrast of tumor nests in keratinocyte carcinomas. Fluorescein and ICG enhanced contrast of keratinocytes and adnexal structures. In OCT of healthy skin gold nanoshells, increased contrast of natural skin openings. Contrast agents may improve delineation and diagnosis of skin cancers; ICG, acetic acid and AlCl have potential in CM and gold nanoshells facilitate visualization of adnexal skin structures in OCT. However, as utility of bedside optical imaging increases, further studies with robust methodological quality are necessary to implement contrast agents into routine dermatological practice.

General information
Publication status: Published
Organisations: Department of Photonics Engineering, Fiber Sensors & Supercontinuum, University of Copenhagen
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Number of pages: 9
Publication date: 1 Jan 2019
Peer-reviewed: Yes

Publication information
Journal: journal of biophotonics
Article number: e201800462
ISSN (Print): 1864-063X
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
Original language: English
Keywords: Au, Contrast agent, Contrast enhancer, Fluorescence confocal microscopy, Gold microparticles, Medical skin imaging, Optical coherence tomography, Optical imaging, Reflectance confocal microscopy
DOI:
10.1002/jbio.201800462
Source: Scopus
Source ID: 85064528595
Research output: Contribution to journal » Review – Annual report year: 2019 » Research » peer-review