In vivo thickness measurement of basal cell carcinoma and actinic keratosis with optical coherence tomography and 20-MHz ultrasound - DTU Orbit (18/02/2019)

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Background Accurate assessment of tumour size is important when planning treatment of nonmelanoma skin cancer (NMSC). Imaging with optical coherence tomography (OCT) has the potential to diagnose and measure depth of NMSC.

Objectives To compare accuracy of mean tumour thickness measurement in NMSC tumours <2 mm of depth using OCT and 20-MHz high-frequency ultrasound (HFUS). In addition, OCT morphology of NMSC was studied in OCT images and the influence of histological and colorimetric values on the quality and penetration depth in OCT images was estimated.

Methods In total, 93 patients were scanned and 34 lesions [23 basal cell carcinoma (BCC) and 11 actinic keratosis (AK) lesions] <2 mm thick and easily identified in OCT images were studied. OCT and HFUS were compared with biopsies. The influence of skin pigmentation and infiltration analgesia on OCT image quality was studied. Skin colour was measured with a colorimeter. Results OCT presented narrower limits of agreement than HFUS. Both methods overestimated thickness but OCT was significantly less biased (0Æ392 mm vs. 0Æ713 mm). No relation between OCT penetration depth and skin colour was found. Conclusions OCT appears more precise and less biased than HFUS for thickness measurement in AK and BCC lesions <2 mm, but both OCT and especially HFUS tended to overestimate tumour thickness.

General information
State: Published
Organisations: Department of Photonics Engineering, Terahertz Technologies and Biophotonics, Copenhagen University Hospital
Contributors: Mogensen, M., Nürnberg, B., Forman, J., Thomsen, J. B., Thrane, L., Jemec, G.
Pages: 1026-1033
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: British Journal of Dermatology
Volume: 160
Issue number: 5
ISSN (Print): 0007-0963
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.55 SJR 2.166 SNIP 1.858
Web of Science (2017): Impact factor 6.129
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.59 SJR 2.07 SNIP 1.893
Web of Science (2016): Impact factor 4.706
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.98 SJR 2.133 SNIP 1.93
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.92 SJR 2.072 SNIP 1.977
Web of Science (2014): Impact factor 4.275
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 3.19 SJR 1.999 SNIP 1.932
Web of Science (2013): Impact factor 4.1
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.97 SJR 2.064 SNIP 1.749
Web of Science (2012): Impact factor 3.759
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 3.02 SJR 1.932 SNIP 1.878