**The SMART approach: Feasibility of Lentigo Maligna Superficial Margin Assessment with handheld Reflectance confocal microscopy Technology.**


**ABSTRACT**

BACKGROUND: Lentigo maligna may be challenging to clear surgically. OBJECTIVE: To evaluate feasibility of using superficial skin cuts as RCM imaging anchors for attaining negative surgical margins in lentigo maligna. METHODS: Included patients presented with lentigo maligna near cosmetically-sensitive facial structures. We evaluated, with handheld-RCM, microscopic clearance of melanoma beyond its dermoscopically-detected edges. Evaluated margins were annotated using shallow skin-cuts. If a margin was positive at 'first-step' RCM evaluation, we sequentially advanced the margin radially outward at that segment by 2mm intervals until an RCM-negative margin was identified. Prior to final surgical excision, we placed sutures at the outmost skin-cuts to allow comparison of RCM and histopathological margin assessments. Primary outcome measure was histopathological verification that RCM-negative margins were clear of melanoma. RESULTS: The study included 126 first-step margin evaluations in 23 patients, median age 70 years (range: 43-91). Seventeen patients (74%) had primary in situ melanoma and 6 (26%) invasive melanoma, mean thickness 0.3mm (range 0.2-0.4mm). Six cases (26%) showed complete negative RCM margins on 'first-step', 11 (48%) were negative at 'second-step', and 4 (17%) at 'third-step'. In two additional cases (9%), margins clearance could not be determined via RCM due to widespread dendritic cells proliferation. The RCM-negative margins in all 21 cases proved clear of melanoma on histopathology. Of the 15 cases that returned at one-year-follow-up, none showed any residual melanoma on dermoscopic and RCM examinations. Inter-observer reproducibility showed fair agreement between bedside RCM reader and blinded remote-site reader, with Spearman's rho of 0.48 and Cohen's kappa of 0.43; using bedside reader as reference, the remote reader's sensitivity was 92% and specificity 57% in positive margin detection. CONCLUSIONS: Margin mapping of lentigo maligna with handheld-RCM, using superficial skin cuts, appears feasible. This approach needs validation by larger studies. This article is protected by copyright. All rights reserved. PMID: 29704275 DOI: 10.1111/jdv.15033