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### Ex vivo fluorescence confocal microscopy for intraoperative, real-time diagnosis of cutaneous inflammatory diseases: A preliminary study.

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#### ABSTRACT

Ex vivo fluorescence confocal microscopy (FCM) is an innovative imaging tool that can be used intraoperatively to obtain real-time images of untreated excised tissue with almost histologic resolution. As inflammatory diseases often share overlapping clinical features, histopathology evaluation is required for dubious cases, delaying definitive diagnoses, and therefore therapy. This study identifies key-features at ex vivo FCM for differential diagnoses of cutaneous inflammatory diseases, in particular, psoriasis, eczema, lichen planus and discoid lupus erythematosus. Retrospective ex vivo FCM and histological evaluations with relevant diagnoses were correlated with prospectively reported histopathologic diagnoses, to evaluate agreement and the level of expertise required for correct diagnoses. We demonstrated that ex vivo FCM enabled the distinction of the main inflammatory features in most cases, providing a substantial concordance to histopathologic diagnoses. Moreover, ex vivo FCM and histological evaluations reached a substantial agreement with histopathologic diagnoses both for all raters and for each operator. After a yet to be defined learning curve, these preliminary results suggest that dermatologists may be able to satisfactorily interpret ex vivo FCM images for correct real-time diagnoses. Despite some limitations mainly related to the equipment of FCM with a single objective lens, our study suggests that ex vivo FCM seems a promising tool in assisting diagnoses of cutaneous inflammatory lesions, with a level of accuracy quite close to that offered by histopathology. This is the first study to investigate ex vivo FCM application in cutaneous inflammatory lesions, and to evaluate the diagnostic capability of this technology. **KEYWORDS:** discoid lupus erythematosus; eczema; ex vivo FCM; lichen planus; psoriasis PMID: 30033578 DOI: 10.1111/exd.13754