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Ex vivo confocal laser scanning microscopy: An innovative method for direct immunofluorescence of cutaneous vasculitis.

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ABSTRACT

Ex vivo confocal laser scanning microscopy (ex vivo CLSM) offers an innovative diagnostic approach through vertical scanning of skin samples with a resolution close to conventional histology. In addition, it enables fluorescence detection in tissues. We aimed to assess the applicability of ex vivo CLSM in the detection of vascular immune complexes in cutaneous vasculitis and to compare its diagnostic accuracy with direct immunofluorescence (DIF) microscopy. Eighty-two sections of 49 vasculitis patients with relevant DIF microscopy findings were examined using ex vivo CLSM following staining with fluorescent-labeled IgG, IgM, IgA, C3 and fibrinogen antibodies. DIF microscopy showed immunoreactivity of vessels with IgG, IgM, IgA, C3 and Fibrinogen in 2.0%, 49.9%, 12.2%, 59.2% and 44.9% of the patients, respectively. Ex vivo CLSM detected positive vessels with the same antibodies in 2.0%, 38.8%, 8.2%, 42.9% and 36.7% of the patients, respectively. The detection rate of positive superficial dermal vessels was significantly higher in DIF microscopy as compared to ex vivo CLSM ($P < .05$). Whereas, ex vivo CLSM identified positive deep dermal vessels more frequently compared to DIF microscopy. In conclusion, ex vivo CLSM could identify specific binding of the antibodies in vessels and showed a comparable performance to conventional DIF microscopy in diagnosing vasculitis. © 2019 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim. KEYWORDS: confocal microscopy; diagnostics; direct immunofluorescence microscopy; fluorescence; vasculitis MID: 31021054 DOI: 10.1002/jbio.201800425