

Confocal microscopy in the diagnosis of fibreglass dermatitis

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First described by Sulzberger and Baer in 1942, fibreglass dermatitis is an occupational dermatosis resulting from percutaneous penetration of fibreglass fragments (1). Diagnosis is a challenge and is often made clinically, as fibreglass fragments can be easily missed in biopsies (2, 3). Skin stripping with adhesive tape followed by examination with light or scanning electron microscopy is an option, but the sensitivity is not high (4). We describe how

reflectance confocal microscopy (RCM) can be utilized to detect fibreglass fibres.

Case Report

A 66-year-old man was referred for patch testing because of an itchy rash affecting his upper back and posterior upper arms. Clinical examination showed numerous pink to skin-coloured papules coalescing into plaques. Two skin biopsies were taken, and were not diagnostic. Patch tests with the North American Standard Series of 50 allergens gave negative results. The patient was a boat technician, and reported lying on his back while restoring the hulls. Fibreglass dermatitis was suspected, and we advised the patient to put a thick carpet on the floor when working. We conducted a review of the skin biopsies, but

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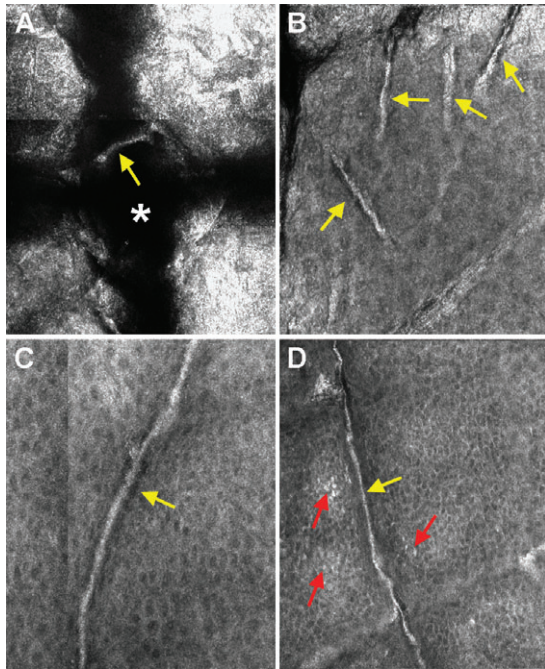


Fig. 1. RCM images of different skin layers: (A and B) stratum corneum, (C) stratum granulosum and (D) stratum spinosum. Fibreglass has a high refractive index and appears white (yellow arrows). Image A shows skin fold (white star) and image D shows inflammatory cells (red arrows).

no evidence of fibreglass fragments or granulomas was seen. At 6-week follow-up, the patient had considerably

improved after just following our instructions. At this time, we performed an adhesive tape test, which gave a negative result. However, examination with *in vivo* RCM revealed hyper-refractive linear structures of similar diameter and varying length, consistent with fibreglass fibers (Fig. 1), parakeratosis, spongiosis, inflammatory cell infiltrate, and disarray at the dermoepidermal junction.

Discussion

Occupational dermatoses constitute a common health concern in the boat building or maintenance industry, with as many as 25% of workers reporting dermatitis (5, 6). Fibreglass dermatitis related to boating or watersports is usually not occupational, and is mostly observed in recreational fishermen and surfers who sit in old boats or ride a surfboard without a wetsuit (7).

RCM is an *in vivo* diagnostic imaging modality with a resolution of approximately 0.2–1.0 μm . Thus, glass fibres, which range from 6 to 15 μm in diameter, can easily be identified, as they are larger than the resolution threshold (1). We were able to locate many fibres of similar diameter but of varying lengths, not only at the level of the stratum corneum, but also at the levels of the stratum granulosum and spinosum. RCM can be an effective non-invasive method to confirm a diagnosis of fibreglass dermatitis in both occupational and non-occupational settings.

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