DERMOSCOPY AND SKIN IMAGING

NONINVASIVE SKIN PATHOLOGY EVALUATION: HIGH-FREQUENCY ULTRASOUND IMAGING AND DIAGNOSTICS

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Background: High Frequency Ultrasound (HFU) skin imaging is the diagnostic procedure for the objective noninvasive skin morphology study. HFU has capacity for quantitative measurement, and differentiation of the inflammatory, exudative, cystic, sclerotic, atrophic, necrotic changes, benign and malignant skin tumors.
In addition, HFU helps to measure precise localization of the lesion, to define tissues involved in pathologic process, lesion size and margins, interaction with the surrounding tissues. This diagnostics information is important for the treatment choice and treatments efficacy monitoring.

Objective: Demonstrate the High Frequency Ultrasound utility for different skin pathology imaging and diagnosis and treatment effects monitoring.

Materials and methods: From January 2013 until January 2018, 438 patients with various skin pathologies were examined with HFU using 22, 33 MHz and 75 MHz probes. For quantitative analysis the thickness and acoustic density of the epidermis, dermis and subcutis and the linear sizes, area and volume of the lesions, were measured.
The most common were patients with the following skin pathologies: psoriasis, scleroderma, acne, atopic dermatitis, and basic cell carcinoma, fibroma, keratoma, hemangioma, abscess, foreign body, granuloma, fillers side effects, scars and atrophies, age marks. All the patients had the clinical or the histopathology diagnosis.

Results: The localization, size, margins and the structure of the skin lesions were studied at patients with different diagnoses: 86 psoriasis, 51 scleroderma, 24 atopic dermatitis, 25 lipomas, 28 hemangiomas, 4 foreign bodies, 20 cysts, 40 basic cell carcinoma,15 actinic keratosis, 8 melanoma, 20 fibroma, 28 keratoma, 40 side effects after filler injections, 30 scars, 4 transdermal fistulas, 15 stretch marks.

Conclusion: High Frequency Ultrasound examination is the safe and useful practical tool for quantitative noninvasive skin lesions imaging, measurement, differentiation and treatment effects monitoring for very wide range of the skin pathologies. The HFU limitation – the max scanning depth 16 mm.