DERMOSCOPY AND SKIN IMAGING

RISK ASSESSMENT OF MELANOMA – A CORRELATION OF DYNAMIC OPTICAL COHERENCE TOMOGRAPHY, HISTOLOGY AND DERMOSCOPY

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Introduction: Low-risk melanomas can be cured by surgery, whereas high-risk tumours frequently develop metastases over time. The risk of metastasis can be predicted solely after excision by assessing histologic features. Growing vascularization is crucial for tumor progression and has great impact on worsening prognosis. Dynamic optical coherence tomography (D-OCT) allows the non-invasive in vivo visualization of blood vessel patterns in the skin.

Objective: In vivo evaluation of blood vessel patterns in melanoma by means of D-OCT and correlation with histologic and dermoscopic parameters for the risk assessment of melanoma.

Materials and Methods: Histologically proven melanomas were analyzed using D-OCT before excision. The vessel patterns in D-OCT were assessed at three different depths (150, 300 and 500 µm) and their vessel shape (dots, blobs, coils, lines, curves and serpiginous), distribution and presence/type of branching were evaluated. The data were then correlated to similar patterns in dermoscopy as well as to histologic parameters like ulceration, regression, inflammation, Hmb45-, Ki67-, PDL-1-, BRAF-, CD31-, Podoplanin- and VEGF-intensity.

Results: 49 melanomas with D-OCT, dermoscopy and histology results were evaluated. In D-

OCT, blood vessel density and atypical shapes (like coils and serpiginous vessels) increase with higher tumor stage. The histologic parameters ulceration, Hmb45 and Ki67 intensity increase with risk, whereas regression, inflammation and PDL-1 positivity decrease with risk. The B-RAF mutation status has no influence. The histologic vessel parameters (CD31, VEGF and Podoplanin) correlate with the findings of D-OCT. Due to the pigment overlay and the summation effect the evaluation of vessels in dermoscopy shows hardly any correlation with D-OCT results.

Conclusions: The atypical vessel patterns in melanoma correlate with histology and risk for metastasis. The tumor vasculature and therefore the risk for tumor progression can be noninvasively assessed using D-OCT prior to excision.