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Invasive Breadth as a Novel Prognostic Marker for Malignant Melanoma

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Purpose of the study: In the UK Melanoma is the 5th commonest cancer. Histological markers are crucial to staging. The AJCC cancer staging manual 8th edition regards tumour thickness as the strongest predictor for melanoma specific survival (MSS). Histological breadth of invasion has never been investigated. We aim to investigate the impact of histological invasive breadth on survival, using 1004 samples. We hypothesise that breadth is a valid prognostic feature.

Methods: The invasive breadth was defined as the horizontal distance between the lateral most invasive components of a melanoma. Measurements were carried out using hematoxylin and eosin stained slides and standard light microscopy. 1,209 patients with primary invasive melanomas, diagnosed at the University Hospitals of Leicester (UHL) between 2004-2012, were eligible. 1,004 patients were included in the study. Data was acquired through original pathology reports and UHL patient databases. Bivariate analysis of breadth and other prognostic features alongside and univariate / multivariate survival analysis with MSS as primary outcome were carried out using R.

Results: Bivariate analysis showed strong association between breadth and other histological variables such as Breslow thickness (BT) and mitoses. Multivariate analysis showed that breadth was strongly associated with MSS, p value <0.001, adjusted hazard ratio (HR) 1.11(CI 1.07-1.15), however adjusted BT HR was not significant. BT was significant in a multivariate analysis only when breadth was not in the model. Analysis showed that an interaction effect was present between breadth and BT. To explore this further the data set was divided into 2 groups of BT ≤ 2mm and BT > 2mm. This showed that breadth was significantly associated with MSS in thicker melanomas, but not thin and vice versa for BT.

Conclusion: This study showed that breadth was strongly associated with MSS even after adjustment and may predict MSS better than BT. Further research is necessary in order to validate our findings.