

Differences in Negative Lymph Node Size in Rectal Cancer Resections are Related to Patient's Immune Reaction

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Introduction: The number and size of lymph nodes without metastasis (LNneg) is an independent prognostic factor in rectal cancer (RC) patients. It is unclear what influences LN size in RC patients. To explore whether there is a relationship between LN size and LN architecture in RC patients we focussed our pilot study on LNnegs using haematoxylin/eosin (H&E) stained slides.

Method: 50 RC patients treated between 2012 and 2015 with surgery (n=17) or neoadjuvant treatment (NAT) followed by surgery (n=33) were included. All H&E slides were digitalised and LNnegs were outlined manually using image analysis software to calculate the LN area. In addition, LNs were reviewed under the microscope with a 2.5x objective to establish number of primary and secondary lymphoid follicles and presence of intranodal fat (inF). LNnegs were grouped in five groups based on primary and secondary follicle count. The relationship between LN morphology and LN area was analysed.

Results: 677 LNnegs were analysed. The median size of LNs with NAT is 98.48mm² (range 2.74mm² - 1107.71mm²) compared to 119.33mm² (range 9.26mm² -- 1214.89mm²) in patients without. 150 (22.5%) LNnegs contained inF. Presence of inF was related to smaller LNneg area in patients after NAT (median (range) LNneg area without inF 103.9mm² (3.5mm²-1007.7mm²) versus 82.2mm² (2.7mm²-642.9mm²) with inF) p=0.04. Increasing numbers of lymphoid follicles were related to larger LNneg area in all patients (p < 0.05).

Conclusion: This pilot study in LNnegs from RC resections showed that patients with larger LNneg appear to have higher number of lymphoid follicles and interestingly less inF. This study seems to confirm a previously proposed interaction between the immune system and fat tissue. Thus, larger LNs in cancer patients could be related to patient prognosis and treatment response, this need to be investigated in future studies.