MORPHOLOGIC PREDICTORS ASSOCIATED WITH REGIONAL
LYMPH NODE METASTASES OF COLORECTAL CANCER

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Introduction. Despite the remarkable progress in the diagnostics, treatment and scientific studies of colorectal cancer (CRC), it still represents one of the most frequent malignant tumours in Latvia and the whole Western world. Regarding the outcome and the selection of treatment, presence and number of regional lymph node (LN) metastases (MTS) are of utmost importance. The analysis of associations between regional LN status and other tumour characteristics can yield pathogenetic information and help in the elaboration of diagnostic protocols for preoperative assessment or in controversial cases.

Aim. The aim of this study was to identify the association between the presence and extent of regional LN MTS and both classical (cancer grade, invasion depth, histological type) and innovative characteristics (cancer volume, nuclear atypia, type of the invasive border, mitotic count).

Materials and methods. A retrospective study design was selected as appropriate. All consecutive patients who underwent colorectal cancer surgery with potentially curative intention were identified by archive search in a single clinical university hospital, 2011 – 2014. The following demographic and clinical data were studied: patients' age and sex, the histological cancer type by World Health organisation (WHO) classification (Bosman *et al*., 2010) and spread characterised by pTNMGR parameters (Edge *et al*., 2010), number of retrieved LN, presence and quantity of MTS in LN and in pericolonic fat, volume and localisation of the tumour. By light microscopy, histological cancer specimens were analysed to evaluate the nuclear atypia in three-tiered scale, invasive border (rounded *versus* streaming dissection) and mitotic count within 10 high power (400x) fields of view (HPF). SPSS and CIA (Altman *et al*., 2000) software was applied for descriptive and analytical statistics involving 95% confidence interval (CI) for proportions and means, interquartile range (IQR) and Pearson correlation. $p < 0.05$ was considered significant.

Results. The archive search yielded 429 cases including 53.4% women [95% CI: 48.7 – 58.1], and 46.6% men [41.9 – 51.3]. The median age of CRC diagnosis was 71.0 year (IQR: 14). Adenocarcinoma was the most frequent

histological type comprising 86.9% of cases [p<0.001]. The tumours predominantly affected sigmoid colon and rectum – 60.4% [54.0 – 66.8]. In 28.2% [22.4 – 34.1] of patients, the tumour was situated on the right side of colon. Direct relation was observed between pN and tumour volume (p=0.02), pT (p<0.01) and G (p<0.01). pT4 constituted 61.4% of pN2 [56.8 – 66.0], 40.0 % pN1 [35.4 – 44.6] and 20.9% of pN0 cases [17.1 – 24.8]. G3 comprised 41.8% cases of pN2 [37.1 – 46.5], 23.6% of pN1 [19.6 – 27.7] and 34.5% of pN0 [30.0 – 39.0] CRC. The invasive border showed streaming dissection in 67.0% [57.2 – 76.8] pN2 CRC cases. In contrast, the border was rounded in 88.4% [85.4 – 91.4] pN0 tumours. The highest mean mitotic count was observed in pN2 CRC reaching 8.8 mitoses per 10 HPF [8.3 – 9.3]. There was significant association between LN MTS, high nuclear atypia (p<0.01) and mitotic count (p< 0.01).

Conclusions.

1.   Surgically treatable colorectal cancer in Latvian patients is diagnosed at the median age of 71 years. It is characterised by significant predominance of adenocarcinoma over other WHO-defined histological types and by predominant left-sided location.

2.   Presence and extent of LN MTS is associated with higher tumour volume (p=0.02), locally advanced spread reflected by pT (p<0.01), high grade (p<0.01), high nuclear atypia (p<0.01) and mitotic count (p< 0.01).

3.   There is significant correlation between pN values and invasive border – pN0 cancers generally have rounded invasion border while high pN is associated with streaming dissection (p<0.01).