

# Liver Needle Biopsies are Poor Predictors of Histologic Tumor Grade for Midgut Neuroendocrine Tumors

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**Background:** Our group has previously shown that neuroendocrine tumors (NETs) are heterogeneous neoplasms having histologic and functional differences between their primary tumor, lymph node, and hepatic metastases. Due to the heterogeneity of these malignancies, we hypothesized that there would be discordance between histologic grade of surgical specimen predicted by preoperative biopsies.

**Methods:** Twenty consecutive patients diagnosed with NETs of the ileum and hepatic metastasis were included. Ki-67 proliferative index and WHO 2010 histologic grade were recorded for preoperative hepatic needle biopsy and subsequent tissue-matched surgical specimens. Concordance between sample values was determined.

**Results:** Ten males and 10 females were included in this analysis. Five and fifteen patients had fine-needle aspirate (FNA) and core needle biopsies, respectively. Preoperative biopsies predicted the histologic grade of subsequent tissue-matched surgical specimens in only 65% of samples (13/20). Of the 7 values that changed grade (7/20, 35%), 4 went from intermediate (G2) to low (G1) grade [1 FNA and 3 core biopsies] and 3 went from low (G1) to intermediate (G2) grade [1 FNA and 2 core biopsies]. The corresponding inter-rater agreement statistic (K) was  $0.251 \pm 0.230$  (95% CI: -0.199-0.702), with  $0.21 < K < 0.40$  indicating fair strength of agreement.

**Conclusion:** Preoperative fine-needle aspirates and core needle biopsies of hepatic metastasis have a 35% error rate in predicting the histologic grade from subsequent tissue-matched surgical NET specimens. Clinicians should be cognizant of this error rate when making decisions on systemic treatment and consider repeat needle biopsy or open biopsy if actual clinical course