ASSESSMENT OF MOLECULAR MARKERS ON PREOPERATIVE FNA BIOPSIES OF METASTATIC LYMPH NODES FROM DIFFERENTIATED THYROID CARCINOMA AND CORRELATION WITH THE PRIMARY THYROID TUMOR: THE FEASIBILITY STUDY

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Background/Purpose: The presence of mutation in differentiated thyroid carcinoma (DTC) has been shown to correlate with poor prognosis. The development of *de novo* mutations in metastatic lymph nodes (LN) was previously described and could be attributed to loss of dormancy and accelerated progression of metastases.
Methods: Molecular analysis of prospectively collected, preoperative ultrasound guided fine needle aspiration (USG FNA) biopsies of 11 metastatic LN collected from 6 patients with DTC (5 with papillary thyroid carcinoma (PTC), 1 with Hürthle cell carcinoma (HCC)) was performed using the miR*Inform*â Thyroid test (Asuragen). Mutations from intrathyroidal DTC were assessed in 4 of 6 patients. The presence of mutations/translocations in BRAF,KRAS,HRAS,NRAS,RET/PTC,PAX8/PPARg was correlated to cytopathology, LN thyroglobulin washout (TGW), surgery, and pathology.
Results: Out of 6 patients, 2 with PTC had corresponding mutations in metastatic lateral neck LN: one patient had RET/PTC1 in thyroidal PTC, 2 LNs positive for RET/PTC1 and 1 LN for BRAFV600E (*de novo* mutation); the second - had BRAFV600E in both the thyroidal PTC and LN FNAs. Two patients operated in the past for PTC had 2 BRAFV600E positive LNs. One patient with HCC had no mutations neither in thyroid tumor nor in 3 metastatic LN. TGW levels were elevated in each metastatic LN.
Discussion & Conclusion: Molecular markers assessment of metastatic LN by USG FNA may aid in diagnostic work up of patients with DTC and provide additional information about the rate of *de novo* mutations, presence of which may indicate more aggressive metastatic tumors. A prospective study is needed to validate this hypothesis.