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Correlation of Muscle Invasion in Bladder Cancer with Cell Adhesion Properties and Oncoprotein Overexpression Using E-Cadherin and HER2/neu Immunohistochemical Markers

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Abstract

BACKGROUND: Most of bladder cancers are proven to be of urothelial origin (transitional cell carcinomas). Above 75% of them are of non-muscle invasive bladder cancer (NMIBC) type at presentation and the remainder are MIBC. Recent studies suggest that both are most probably two different categories based on both the histopathological and molecular features. The comprehensive understanding of the biomarkers expression in both categories will help in understanding the molecular event underlying each of them and may provide possible chances for targeted therapeutic options.

AIM: This study aims to study the differential expression of both E-cadherin and human epidermal growth factor receptor-2 (HER2) in the two categories of bladder cancer NMIBCs and MIBCs.

MATERIALS AND METHODS: A total of 40 blocks were collected retrospectively from cases of cancer bladder, segregated as 20 cases NMIBCs and 20 cases MIBCs, subjected for E-cadherin and HER2 immunostaining.

RESULTS: E-cadherin showed positive expression in 65% of cases of NMI group and in 10% of the MI group, with high statistical significance ($p < 0.001$). Regarding HER2, positive expression was seen in 25% of NMI cases and in 90% of MI cases, with statistical significance ($p < 0.001$). Comparison of the results of both markers and their correlation per case showed that 90% of tumors with muscle invasion were E-cadherin negative and HER2 positive.

CONCLUSION: The significant association of loss of E-cadherin immunohistochemistry expression and positive HER2 overexpression in MIBC versus NMIBC figured out more differences between the two categories and added to the understanding of their biology. The possibility of validation of HER2-targeted therapy in MIBC cases is now strongly suggested.

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