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Correlation of leptin with clinical and pathological features of breast cancer

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Introduction: Leptin hormone which is secreted from the adipose tissue and responsible for satiety through its action on leptin receptors was found to have some adverse effects on other tissues. It promotes the tumorigenesis of breast tissue.

Objectives: The objective of the present study is to show the correlation between leptin and clinico-pathological features of breast cancer.

Methodology: Serum leptin levels were measured in the control and study group. Immunohistochemistry for the leptin and its receptors expression were studied in the breast cancer tissue and the normal adjacent tissue.

Results: Significant differences in serum leptin levels between the control and the study group were observed. No differences between the pre and post-operative serum leptin levels. Immunohistochemistry studies showed that leptin and its receptors were positively expressed in the majority of breast cancer tissue and this expression was significantly correlated with the distant metastasis of the breast cancer.

Conclusion: Leptin may have an important print in mapping the clinico-pathological features of breast cancer. Attempts to inhibit leptin levels might help in the prevention of breast cancer and might lower its aggressiveness.

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Breast cancer metastasis to bone: Breast osteoblast-like cells on the way home

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The aim of this study was to verify if breast cancer metastases to bone are early determined in the primitive lesions as breast osteoblast-like cells (BOLCs) appear in breast tissues. To this end, we collected 64 breast infiltrating carcinomas (IC) and 50 breast benignant lesions. In addition, we collected 10 biopsies of bone metastasis selected from IC patients. Immunohistochemical and ultrastructural analysis allowed us to investigate the presence of recognized BOLCs in breast cancer and metastatic sites. Moreover, we investigated the occurrence of epithelial to mesenchymal transition (EMT) and the expression of molecules involved in bone metabolism. EMT characterization allowed us to establish the presence of a pool of "mesenchymal-like" cells in IC. Our results showed a higher expression of BMP-2/4 and PTX3 in breast IC suggesting that the microenvironment of breast cancer is very similar to the bone one. Moreover, we also identify numerous RANKL and Vitamin D-receptor positive breast cancer cells as aspect by osteoblasts. Thanks to ultrastructural analysis, we also revealed the presence of BOLCs at the metastatic site. In this microenvironment BOLCs, "being at home", actively produced hydroxyapatite crystal. All together, these data suggest a possible mechanism of bone metastases. In our thesis, BOLCs detach from the primary tumor site, and colonize the bone surface triggering bone resorption by RANK/RANKL pathway. In this context, the metastatic lesions could take place thanks to the unbalance in the bone microenvironment due to the presence of a high amount of cells able to activate the osteoclasts (resident osteoblasts and the BOLCs).

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