HER-2/neu Amplification in Benign Breast Disease and the Risk of Subsequent Breast Cancer

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Background
The HER-2/neu oncogene (also called c-erbB-2) codes a surface membrane protein that interacts with the epithelial growth factor receptor. Several studies have reported an association between HER-2/neu amplification and both earlier relapse and decreased survival in patients with breast cancers. The clinical significance of HER-2/neu expression in benign breast lesions (BBL) remains unclear. This study assessed the amplification of the HER-2/neu gene in BBL and risk of subsequent breast cancer.

Methods
The investigators measured HER-2/neu gene expression in benign and malignant breast tissues from 137 women with BBL who subsequently developed breast cancer, and in benign tissue from 156 controls with BBL who did not develop cancer.

Results
- Low-level HER-2/neu amplification was detected in 4.5% of benign biopsies from control women, compared with 9.5% of benign tissues and 18% of malignant tissues from breast cancer patients.
- In women with both HER-2/neu amplification and a proliferative histopathologic diagnosis, the risk of breast cancer was increased more than seven-fold.
- Overexpression of HER-2/neu protein was more common in tissues from breast tumors than in benign breast tissue samples.
- Women with HER-2/neu gene amplification in their malignant tumors were also likely to have HER-2/neu gene amplification in earlier, benign breast samples.

Discussion
Genetic alterations, including HER-2/neu gene amplification, may occur as relatively early events in the development of breast cancer. This finding may help physicians to identify the subgroup of women with benign breast lesions who may be at higher risk of developing breast cancers.