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Dissecting the role of adipose tissue in high mammographic density

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Abstract Body

High mammographic density is characterised by an increase in the glandular and stromal components, and decreased adipose components, of the breast tissue. Women with high mammographic density have a 4-6 times increased risk of developing breast cancer compared to women with low mammographic density when matched for age and BMI. CC-chemokine ligand 2 (CCL2) is a pro-inflammatory cytokine responsible for attracting monocytes and macrophages to sites of tissue injury and inflammation. CCL2 is expressed by both tumour and stromal cells in breast carcinoma and is furthermore correlated with poor prognosis. Using a mouse model which over-expresses CCL2 in the mammary epithelium, our lab has previously demonstrated that CCL2 over expression results in an increase in susceptibility to the chemical carcinogen DMBA, macrophage recruitment, and density of stroma surrounding the mammary epithelium. These results suggest that CCL2 may be a driving force behind high mammographic density and this mouse model may be used to explore the relationships between inflammation, high mammographic density, and increased cancer risk. The aim of the current study is to further investigate the effect of CCL2 over-expression on the normal mouse mammary gland. Light microscopy studies of the CCL2 mouse appeared to show an increase in areas of highly eosinophilic adipose tissue composed of several small lipid droplets in comparison to wild type controls. Analysis of these regions showed that while the overall amount was not significantly increased in CCL2 over-expressing mice, the amount of epithelium associated with these regions is significantly increased. Further work is required to determine the nature of these multilocular cells and their relationship with epithelium, stroma, and CCL2, which may provide further understanding of the biological mechanisms underlying high mammographic density.