The study of relationship between ADC value and maximal diameter of the breast cancer with Ki-67 expression during neoadjuvant chemotherapy

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Purpose
Study the ADC value and the maximal diameter and their changes of breast cancer before and after neoadjuvant chemotherapy, to determine the relationship with different expression level of ki-67.

Methods
48 patients with breast cancer confirmed by biopsy underwent MR DWI and enhanced scan before and after 4 cycles neoadjuvant chemotherapy. The ADC value and the maximum diameter of the cancer foci were measured before and after chemotherapy, and the rate of their changes $\Delta$ADC% and $\Delta$D% were calculated. Using different Ki-67 index level, all the foci were divided into three groups: group A with Ki-67 <20%, group B with Ki-67 between 20% and 60%, and group C with Ki-67>60%. Using One-Way ANOVA to compare the ADC values, $\Delta$ADC% and $\Delta$D% of the three groups before and after chemotherapy, determine whether there were differences.

Results
The ADC value of group A was higher than that of group B and C before chemotherapy, the difference was statistically significant (P <0.05); while the ADC value of group C was higher than that of group A and B, the differences were statistically significance (P <0.001); the ADC change rate($\Delta$ADC%) of group C was greater than group A and B, the differences were significant (P <0.001). The maximum diameter of group A was lower than that of group B and C before and after chemotherapy, and the differences were statistically significant (P <0.05); the change rate of the maximum diameter in group B was less than group A (P <0.001) and C (P <0.05), and the differences were statistically significant.

Conclusion
The ADC value and the maximal diameter of breast cancer differed with different expression levels of Ki-67 index before and after neoadjuvant chemotherapy, and their response to neoadjuvant chemotherapy varied as well.

Figure1, The ADC values of the three group with column diagram.
Figure2, The relationship of $\Delta$ADC% with ki-67.
Figure3, The relationship of the maximal diameter with ki-67.