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## Contrast-enhanced spectral mammography in radiological assessment of response to neoadjuvant chemotherapy in breast cancer

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**Purpose:** To compare the effectiveness of low-energy and subtraction contrast-enhanced spectral mammography (CESM) images in detecting the complete response (CR) to neoadjuvant chemotherapy (NAC) in patients with breast cancer.

**Methods and materials:** 78 patients who received NAC in years 2018-2021 were qualified for the retrospective study. CESM imaging (SenoBright, GE Healthcare, 3000 N. Grandview Blvd., Waukesha, WI, USA) was performed before starting NAC and as a follow-up two weeks before the end of chemotherapy. Response to NAC was assessed according to RECIST 1.1 (Response Evaluation Criteria in Solid Tumors). The results were compared and their compliance with the postoperative histopathological (HP) examination was assessed. Correlations between the maximum tumor size after NAC were assessed using both methods. HP, sensitivity, specificity, negative and positive predictive values were calculated.

**Results:** Low energy CESM images tend to overestimate residual changes by an average of 7,4mm, while subtraction CESM images tend to underestimate them by an average of 1,9mm. Maximum change size for low-energy and subtraction CESM images following NAC and the maximum size in the histopathological examination showed a low level of correlation for low-energy CESM images ( $R=0.223$ ,  $p=0.053$ ) and a moderate level for subtraction CESM images ( $R=0.58$ ,  $p < 0.000$ ). The sensitivity of low-energy images in predicting CR was 25%, while the specificity was 94%, PPV 70%, NPV 69.1%. In the case of subtraction images, respectively: 75% and 76%, PPV 63,6%, NPV 84,4%.

**Conclusion:** CESM subtraction images achieve high sensitivity in detection of CR after NAC and correlate with the size of the residual lesions in the histopathological examination.

**Limitations:** The data were retrospective. The number of patients was relatively low. All CESM examinations were conducted on a single vendor system.