The impact of co-existing ductal carcinoma in situ in invasive early hormone receptor positive breast cancer on the genomic and clinical risk of recurrence

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Background: Invasive early breast cancer (IBC) often presents with a co-existing ductal carcinoma in situ (DCIS) component, while about 5% of the cases present with an extensive (>25%) intraductal component (EIC). The presence of a DCIS component was previously shown to be associated with favorable clinico-pathological characteristics and survival outcomes. However, the association between co-existing DCIS and genomic risk of recurrence is unclear.

Methods: Patients with early hormone receptor positive (HR+) HER2neu-negative (HER2-) breast cancer and known OncotypeDX breast recurrence score (RS), who underwent breast surgery in our institute, were included. A natural language processing (NLP) algorithm was used to identify co-existence of extensive DCIS (DCIS-H) and non-extensive DCIS (DCIS-L) in surgical pathological reports. Genomic risk was determined using OncotypeDX RS, while clinical risk was calculated according to the MINDACT criteria, based on tumor size and grade. The genomic and clinical risks of DCIS-H, DCIS-L and pure IBC (No-DCIS) were compared.

Results: A total of 45 (5%) DCIS-H cases, 468 (56%) DCIS-L cases and 328 (39%) No-DCIS cases were identified. DCIS-H cases presented with less aggressive clinico-pathological characteristics, such as lower proportions of histologic grade III (10% vs 26% vs 21%) and lower proportions of node-positive disease (13% vs 18% vs 21%), compared to DCIS-L and No-DCIS cases (respectively). The distribution of OncotypeDX RS significantly varied between the groups. DCIS-H tumors were less likely to have a high RS and more likely to have a low or intermediate RS compared to DCIS-L and No-DCIS tumors (High RS: 4% vs 20% vs 20%, Low + intermediate RS: 96% vs 80% vs 80%, respectively; p=0.04). Additionally, the proportions of high clinical risk cases were lower in the DCIS-H group compared to the DCIS-L and No-DCIS groups (42% vs 53% vs 50%, respectively; p=0.002). Based on genomic and clinical risk and current guidelines, we found that women presented with an extensive DCIS component (DCIS-H) had a lower probability of receiving an adjuvant chemotherapy recommendation compared to women presented with a non-extensive DCIS component (DCIS-L) or pure IBC (No-DCIS) (11% vs 29% vs 25%, respectively; p=.035). No differences in disease recurrence were detected between the groups.

Conclusions: Co-existing extensive DCIS in invasive early HR+Her2- breast cancer is significantly correlated with lower genomic and clinical risk of recurrence and a smaller chance for chemotherapy recommendation. The rarity of this condition (5% of cases) limited our ability to detect differences in outcomes. These findings warrant future studies of the underlying genomic landscape of co-existing extensive DCIS.