The clinical survival benefit of postmastectomy radiotherapy patients screened from T1~2N1M0 breast cancer according to tumor size and the number of lymph nodes

Hongwei Yang(yhwsnch@163.com), Maoshan Chen, Lingmi Hou, Yunhui Huang, Dewu Mou, Li Fan, Heng Yin.

Background & purpose
The prognostic value of postmastectomy radiotherapy (PMRT) in stage T1-2N1M0 breast cancer patients is controversial. Our previous study found that the number of metastatic node was an indicator of benefit from RT. The purpose of this study was to evaluate the impact of PMRT on survival based on the combination of lymph node metastatic number and tumor size in this population.

Design & Methods
We used data from the Surveillance, Epidemiology, and End Results (SEER) program. Patients diagnosed as T1-2N1M0 invasive breast cancer who received mastectomy between 2004 and 2015 were identified. Patients were grouped into PMRT group and no-PMRT group according to whether PMRT was performed. Patients stratified into different tumor burden based on combination of tumor size and positive node number. Our main endpoint was overall survival (OS). Multivariate Cox proportional hazard models were built to assess the prognostic factors analysis and to estimate hazard ratios (HR) and their 95% confidence intervals (CI). Prognostic value of PMRT was calculated using multivariate Cox model in patients with different tumor burden.

Main Results
A total of 29366 patients included in the final analysis, 20167 (68.7%) cases in no-PMRT group and 9199 (31.3%) cases in PMRT group. Multivariable Cox model analysis shown that PMRT could improve OS (HR=0.89, 95%CI 0.83-0.96, P=0.001) for stage T1-2N1M0 breast cancer (Fig. 1A). Stratified analysis showed that not all patients could benefit from the PMRT (Tab. 1). PMRT are associated with exaltation of OS among the patients with tumors size of 4-5 cm combined with two (HR=0.69, 95%CI 0.51-0.94, P=0.017, Fig 1B) or three (HR=0.65, 95%CI 0.44-0.95, P=0.027, Fig 2A) positive nodes. PMRT could improve OS for patients with tumors 2-3 cm in size and three positive nodes (HR=0.61, 95%CI 0.48-0.78, P<0.001, Fig. 2B). No benefit was observed in patients with other level of tumor burden.

Conclusion
PMRT could not improve OS for all patients. The combination of tumor size and the number of positive lymph nodes seems to be reliable predictors of OS benefit from radiotherapy, which may be helpful to physician making the decision of using PMRT.