

PRIMARY TUMOR LOCATION IMPACTS BREAST CANCER SURVIVAL

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Introduction: The prognostic significance of tumor location in breast cancer remains unclear. To better understand this relationship, we evaluated a prospectively maintained tumor registry of all Department of Defense (DOD) military medical centers organized to deliver equitable health care.

Methods: The DOD Tumor registry was queried over a ten year period for patients with infiltrating ductal adenocarcinoma or infiltrating lobular carcinoma. Characteristic variables included patient age at presentation, race, stage of disease, location of primary lesion, and grade of tumor. The primary outcome variable was cancer-specific survival. Univariate statistics were utilized to compare patients based on location of the lesion. Kaplan-Meier analysis was used to describe the impact of location on survival, and Cox-Regression analysis was utilized to determine the impact of confounding variables.

Results: During the study period, 13,984 patients were treated for breast infiltrating ductal adenocarcinoma or infiltrating lobular adenocarcinoma. 7,871 (58%) originated from the upper outer quadrant or axillary tail, whereas the remainder were found at the nipple complex (9%), upper inner quadrant (14%), lower inner quadrant (9%), and lower outer quadrant (10%). Univariate analysis of cancer specific survival revealed a significant difference based on location of the primary breast cancer (Log-rank test, $P < 0.05$). Utilizing Cox-Regression analysis, several factors impacted overall survival to include age, race, grade of tumor, and stage of disease, but location did not impart a clinically significant impact (Table 1). Upper outer quadrant lesions were associated with an independent contribution toward a survival benefit.

Conclusion: Upper outer quadrant infiltrating breast cancers have a more favorable survival advantage when compared to tumors in other locations. Furthermore, tumors were most commonly found in this region. As expected, factors that negatively impacted survival included high grade tumors, advanced stage, and race.

Table I. Cox Regression results for independent predictors of cancer specific survival.

Factor	Breast Cancer Survival** HR (95% CI)	P Value
Age (per year)	1.035 (1.031-1.039)	<0.01
Race		
White	1.0 [†]	
Black	1.35 (1.172-1.554)	<0.01
Asian	0.855 (0.707-1.035)	0.109
Hispanic	0.935 (0.714-1.223)	0.623
Grade		
1	1.0 [†]	
2	1.37 (1.193-1.508)	<0.01
3	1.68 (1.456-1.959)	<0.01
AJCC Stage		
I	1.0 [†]	
II	1.68 (1.51-1.88)	<0.01
III	4.05 (3.48-4.72)	<0.01
IV	10.7 (8.62-13.29)	<0.01
Location		
Nipple Complex	1.0 [†]	
Upper Inner Quadrant	0.840 (0.694-1.018)	0.075
Lower Inner Quadrant	0.888 (0.717-1.099)	0.273
Upper Outer Quadrant	0.820 (0.820-0.960)	<0.05
Lower Outer Quadrant	0.864 (0.702-1.063)	0.168
Axillary Tail	0.702 (0.382-1.290)	0.254

** Colon Cancer Survival HR is for death.

[†] Represents reference category.