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Andrew Fenton

Elisabeth Dupont

Theodore Tsangaris

Carlos Garcia-Cantu

Marissa Howard-McNatt

See next page for additional authors

Authors

Andrew Fenton, Elisabeth Dupont, Theodore Tsangaris, Carlos Garcia-Cantu, Marissa Howard-McNatt, Akiko Chiba, Adam Berger, Edward Levine, Jennifer Gass, Kristalyn Gallagher, Sharon Lum, Ricardo Martinez, Alliric Willis, Sonali Pandya, Eric A. Brown, Amanda Mendiola, Naveenraj Solomon, Maheswari Senthil, David Ollila, David Edmonson, Melissa Lazar, Jukes Namm, Fangyong Li, Meghan Butler, Noreen McGowan, Maria Herrera, Yoana Avitan, Brian Yoder, Laura L. Walters, Tara McPartland, Victor Haddad, Hongwei Ma, Ming Xie, and Anees Chagpar

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Does breast cancer subtype impact margin status in patients undergoing partial mastectomy?

Andrew Fenton[1], Elisabeth Dupont[2], Theodore Tsangaris[3], Carlos Garcia-Cantu[4], Marissa Howard-McNatt[5], Akiko Chiba[5], Adam Berger[3], Edward Levine[6], Jennifer Gass[7], Kristalyn Gallagher[8], Sharon Lum[9], Ricardo Martinez[4], Alliric Willis[3], Sonali Pandya[7], Eric Brown[10], Amanda Mendiola[1], Mary Murray[1], Naveenraj Solomon[9], Maheswari Senthil[9], David Ollila[8], David Edmonson[7], Melissa Lazar[3], Jukes Namm[9], Fangyong Li[1], Meghan Butler[1], Noreen McGowan[2], Maria Herrera[4], Yoana Avitan[8], Brian Yoder[11], Laura Walters[10], Tara McPartland[12], Victor Haddad[4], Hongwei Ma[10], Ming Xie[10] and Anees Chagpar[12]. [1]Cleveland Clinic Akron General, Akron, OH;[2]Watson Clinic, Lakeland, FL;[3]Thomas Jefferson University, Philadelphia, PA;[4]Doctors Hospital at Renaissance, Edinburg, TX;[5]Wake Forest University, Winston-Salem, NC;[6]Wake Forest University, Winston-Salem, NC, NC;[7]Women and Infants Hospital, Providence, RI;[8]University of North Carolina, Chapel Hill, NC;[9]Loma Linda University, Loma Linda, CA;[10]Beaumont Hospital, Troy, MI;[11]MicroPath Laboratories, Lakeland, FL;[12]Yale University, New Haven, CT

BACKGROUND: It is known that breast cancer subtype (e.g., luminal vs. triple negative (TN)) can affect response to systemic therapy and prognosis; however, it is less well-understood whether these subtypes affect margin status and should therefore alter surgical management. METHODS: Data from two randomized trials evaluating cavity shave margins (CSM) on margin status in patients undergoing partial mastectomy (PM) were used for this analysis. The data were restricted to patients who had invasive carcinoma present in the PM specimen, and in whom data for all three receptors (ER, PR and HER-2) were known. Patients were classified as luminal if they were ER and/or PR+, HER-2 enriched if they were ER and PR negative but HER-2 positive, and TN if they were negative for all three receptors. We evaluated the impact of subtype on the margin status at the time the surgeon had completed their standard PM, prior to randomization to CSM vs. no CSM. Non-parametric statistical analyses were performed using SPSS Version 26. RESULTS: 350 patients were included in this cohort for analysis. The median patient age was 64 (range; 32-94 years) and the median invasive tumor size was 1.2 cm (range; 0.6-8.0 cm). 326 (93.1%) were luminal type, 22 (6.3%) were triple negative, and 2 (0.6%) were HER-2 enriched. Subtype was significantly correlated with race (black patients were more likely to have TN disease than white patients, 22.2% vs. 3.8%, p=0.001), palpability (TN tumors were more likely to be palpable than luminal cancers 54.5% vs. 29.8%, p=0.007) and grade (78.9% of TN cancers were high grade vs. 13.5% of luminal cancers p<0.001). Subtype did not correlate with Hispanic ethnicity, node positivity, nor lymphovascular invasion (p>0.05 for all). While patients with TN and HER-2 enriched tumors were more likely to receive neoadjuvant therapy, this did not reach statistical significance (p=0.117). Surgeons were no more likely to take selective margins on the basis of molecular subtype (p=0.413). In this cohort, the overall positive margin rate was 33.7%. This did not vary based on molecular subtype (positive margin rate: 33.7% for patients with luminal tumors vs. 36.4% for those with TN tumors, p=0.425). On multivariate regression controlling for molecular subtype, race, grade and palpability, the only factor which predicted positive margin status was grade (p=0.005), with high grade tumors being significantly more likely to have a positive margin than low grade tumors, independent of other factors (OR=3.503, 95% CI: 1.638-7.494, p=0.001). CONCLUSION: While molecular subtype correlates with race, tumor grade and palpability, it does not predict margin status. Therefore, molecular subtype should not, independent of other factors, influence surgical decision-making.