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"Treatment approach for small cell breast carcinoma"

Methods: A case report of a patient with small cell breast carcinoma (SCBC) conducted by retrospective review of Electronic Health Records and literature review.

Results: A 50-year-old woman presented with a right breast mass. Imaging showed a 3.3 cm mass, and an US guided biopsy showed a high-grade neuroendocrine carcinoma with no expression of ER, PR, and HER2 markers. Staging studies did not show any distant metastasis. The patient underwent a right mastectomy with sentinel lymph node biopsy which confirmed a 0.7 cm intermediate variant of high-grade small cell carcinoma with extensive lymphatic invasion in the upper central and lateral regions of the breast and 4 out of 8 axillary lymph nodes with metastatic cancer. No mutations were identified on germline genetic testing. Tumor molecular profiling showed RB1 and TP53 mutations. She received adjuvant therapy with carboplatin/paclitaxel/pembrolizumab then doxorubicin/cyclophosphamide/pembrolizumab followed by post-mastectomy radiation and maintenance pembrolizumab. At the end of treatment, imaging showed no evidence of recurrence, and no circulating tumor DNA was detected. Twenty-three months after diagnosis she remains with no evidence of recurrence.

Small cell carcinoma most frequently arises in the lung but can also originate in extrapulmonary sites. Extrapulmonary small cell carcinomas are aggressive and very rare cancers. The cervix and gastrointestinal tract the most common sites. Even among extrapulmonary small cell cancers, SCBC is a rare and represents less than 1% of primary breast cancers. Overall survival is approximately 5 years, and it closely associated with stage. Due to its infrequency, there is no established treatment protocol for SCBC. Current management relies on adapting therapies used for small cell lung cancer (SCLC), which includes surgery, radiation, and chemotherapy. Standard chemotherapy regimens for SCLC typically involve 4-6 cycles of etoposide combined with a platinum-based drug. Studies have shown comparable efficacy between cisplatin/paclitaxel and cisplatin/etoposide for SCLC treatment. Recently, consolidation with durvalumab was reported to improve overall survival in limited disease SCLC. However, treatment for extrapulmonary small cell carcinoma, including SCBC is based on limited evidence from case reports and extrapolation from the guidelines for SCLC. An alternative approach is to treat SCBC following breast cancer guidelines based on ER, PR, and HER2 status. For early TNBC, the most effective regimen includes chemoimmunotherapy with pembrolizumab in combination with carboplatin/paclitaxel, followed by doxorubicin/cyclophosphamide.

Conclusions: This case report illustrates the clinical presentation and challenges in the clinical management of SCBC. SCBC and triple negative breast cancer have similar histologic and biologic characteristics. As platinum and immunotherapy are now integral components of the management of both SCLC and TNBC. Therefore, using the most effective treatment for primary TNBC represents a viable treatment option for primary triple-negative SCBC. These results may inform future SCBC treatment guidelines to consider ER, PR, and HER2 and other molecular and biologic markers when determining chemotherapy approaches.