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Skin dose effects of postmastectomy chest wall radiation therapy using brass mesh as an alternative to tissue equivalent bolus

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Erin Healy, MA , Shawnee Anderson, BA Jing Cui, DSc Laurel Beckett, PhD , Allen M. Chen, MD Julian Perks, PhD Robin Stern, PhD ,Jyoti Mayadev, MD

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Abstract

Purpose

The use of brass mesh as a bolus is relatively uncommon in postmastectomy chest wall radiation therapy (PMRT). This study aimed to characterize the skin dose effects of using 2-mm fine brass mesh as an alternative to the traditional tissue-equivalent bolus during chest wall PMRT.

Methods and Materials

Data were collected from patients who received PMRT using brass mesh at the University of California Davis Department of Radiation Oncology between January 2008 and June 2011. Several patient characteristics including age, body habitus, and ethnicity were analyzed along with several disease and treatment characteristics to determine whether or not they had an impact on the skin reaction observed during radiation treatment. Additionally, in vivo surface dose measurements were obtained for 16 of the 48 patients (33%).

Results

Forty-eight female patients aged 28-83 received PMRT using brass mesh. As expected, the severity of skin toxicity increased with subsequent doses of radiation with all patients beginning treatment with no skin reaction (National Cancer Institute scores [NCIS] = 0) and the majority of patients completing treatment with either faint to moderate erythema (n = 19, 40%, NCIS = 1) or moderate to brisk erythema (n = 23, 48%, NCIS = 2). In vivo dosimetry analysis revealed surface doses between 81% and 122% of the prescribed dose, with an average of 99% of the prescribed radiation dose and standard deviation of 10% being delivered.

Conclusions

For postmastectomy chest wall radiation therapy, brass mesh is an effective alternative to tissue-equivalent bolus. The brass mesh achieved moderate erythema in the majority of patients at the end of treatment and the surface dose was validated using in vivo dosimetry.