

Brief Report

Surgeon-performed ultrasound reliably predicts skin spacing and may decrease the rate of MammoSite balloon catheter explantation in patients undergoing brachytherapy for breast cancer

J. Ben Wilkinson, B.A.^a, Teresa Boyle, M.D.^b, Juhee Song, Ph.D.^c,
Kandice Kilbride, M.D.^d, Darlene Miltenburg, M.D.^{e,*}

^aCollege of Medicine, Texas A&M University System Health Science Center, Temple, TX, USA; ^bDivision of Radiation Oncology, ^cDepartment of Biostatistics, ^dDepartment of General Surgery, and ^eDepartment of Surgical Oncology, Scott and White Clinic/Memorial Hospital, Temple, TX, USA

KEYWORDS:

Accelerated partial breast irradiation;
Brachytherapy;
Mammosite;
Skin spacing;
Skin toxicity;
Ultrasound

Abstract

OBJECTIVE: The purpose of this study was to determine if the distance from the skin to the seroma cavity, as measured with ultrasound (US) before catheter placement, correlated with the distance from skin to MammoSite balloon catheter as measured on computerized axial tomography (CAT) after catheter placement.

METHODS: US was used to measure the distance from the skin to the seroma cavity, and then the MammoSite balloon catheter was inserted. Skin-to-balloon distance was then measured using CAT. Statistical analysis was performed to determine correlation between the 2 measurements.

RESULTS: Our cohort consisted of 70 patients. US distance correlated with CAT distance (Pearson correlation coefficient .70). Mean US distance was 10.8 mm (SD 4.5 mm); mean CAT distance was 11.9 mm (SD 7.5 mm); and mean difference between the 2 measurements was -1.1 mm (SD 6.1 mm). A US measurement ≥ 7.6 mm predicted successful completion of MammoSite brachytherapy in 98% of patients. Patients with skin-to-seroma cavity distance < 7.6 mm required explantation before treatment completion 39% of the time.

CONCLUSIONS: Office-based US performed before insertion of the MammoSite balloon catheter statistically correlates with measurement by CAT. Patients with ≥ 7.6 mm skin-to-seroma cavity distance on US had a higher completion rate of MammoSite brachytherapy treatment.

© 2008 Published by Elsevier Inc.

Limiting factors for successful brachytherapy using the MammoSite balloon catheter (Cytec, Marlborough, MA, USA) include nonconformance of the balloon to the

lumpectomy cavity, positive margins or nodes, and inadequate skin spacing.¹⁻³ If the balloon is too close to the skin (inadequate skin spacing), the skin may receive toxic doses of radiation, resulting in complications that range from erythema to a full-thickness burn. Between 7.0% and 12.9% of implanted balloons are removed before treatment because of inadequate skin spacing.⁴ Explantation subjects patients to an unnecessary procedure and is costly.¹ An acceptable

* Corresponding author. Tel.: +1-254-724-2448; fax: +1-254-724-8587.

E-mail address: dmiltenburg@swmail.sw.org

Manuscript received May 5, 2007; revised manuscript November 19, 2007

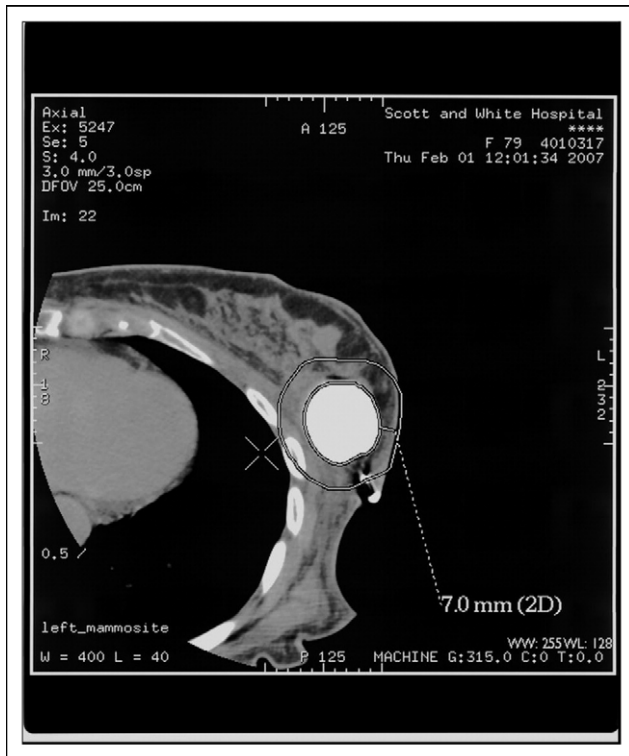


Figure 1 CT skin spacing.

skin-to-balloon distance is considered to be between 5 and 7 mm.¹⁻⁵ At our institution, skin spacing is evaluated with computerized tomography (CAT) after the balloon is inserted (ie, CAT skin spacing) (Fig. 1).

If the MammoSite balloon catheter is placed after lumpectomy, the surgeon could use ultrasound (US) to measure the distance from the skin to the seroma cavity (ie, US skin spacing) before balloon insertion (Fig. 2). If one was confident that the skin spacing measured on US was accurate, one could use this measurement to decide whether the balloon catheter should be inserted. Alternatives for treatment if the skin spacing or cavity conformance is found to be insufficient include the use of an alternate implantable brachytherapy device, interstitial brachytherapy, accelerated external-beam partial breast irradiation, or conventional external-beam whole breast irradiation.

The primary purpose of this study was to determine whether US skin spacing correlates with CAT skin spacing. The secondary purpose was to determine a US skin-spacing value that could help predict successful completion of a full course (3.4 Gy \times 10 fractions) of brachytherapy.

Methods

At our institution, women who choose to undergo MammoSite brachytherapy are entered into an Institutional Review Board–approved registry. Informed consent is obtained from all study participants. Data from our MammoSite registry was used for this study. Women were offered the

MammoSite balloon catheter if they were ≥ 50 years old; had tumor size ≤ 2 cm; had ductal carcinoma in situ or invasive ductal or invasive lobular histology; had negative histologic margins; and had negative lymph nodes. Inclusion criteria for entry into this study were women who had both US and CAT skin spacing recorded.

In our center, criteria for balloon explantation is a skin-to-balloon distance < 5.0 mm on a single 3-mm CAT slice or skin-to-balloon distance of 5.0 mm on ≥ 3 CAT slices.

A single surgeon measured the US skin spacing in the office and then implanted the MammoSite balloon catheter. US skin spacing was considered to be the closest distance between the skin and the seroma cavity and not the average distance over the length of the seroma. US and CAT imaging were performed on all patients and were considered to be standard tools for treatment with brachytherapy. CAT skin spacing was then measured by a single radiation oncologist (who was blind to the US measurement) using high-speed helical CAT. In this study, US distances measured by the surgeon were not compared with measurements made by a radiologist. Univariate logistic regression, including Wilcoxon's test for paired samples, was performed to determine correlation of the 2 measurements and the US measurement that best predicted successful completion of a full course of brachytherapy. $P < .05$ was considered significant.

Results

Between September 2004 and March 2007, 122 patients underwent breast conservation and attempted MammoSite brachytherapy; 105 (86%) patients completed treatment with 3.4 Gy \times 10 fractions. Four patients (3%) received a boost (3.4 Gy \times 2 fractions) through the balloon, and then the catheter was explanted. In 3 of these patients, the balloon was removed because of inadequate skin distance and in 1 patient because of a positive sentinel lymph node. One

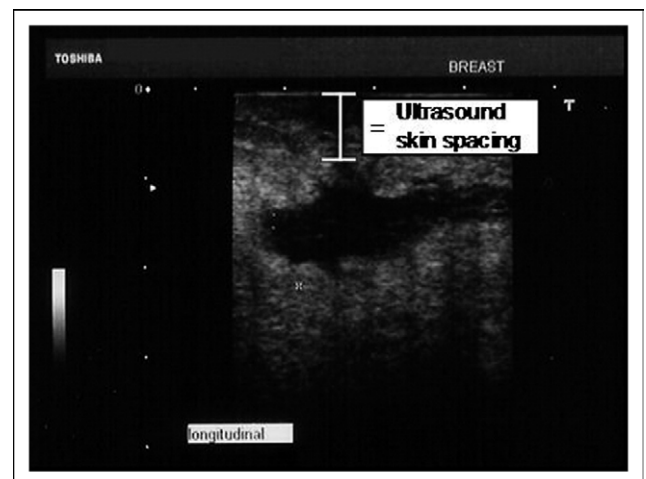


Figure 2 US skin spacing.

Download English Version:

<https://daneshyari.com/en/article/4281609>

Download Persian Version:

<https://daneshyari.com/article/4281609>

[Daneshyari.com](https://daneshyari.com)