Received: 30 September 2020 | Revised: 28 February 2021 | Accepted: 1 March 2021

DOI: 10.1111/tbj.14223

COMMENTARY

The Breast Journal WILEY

Improving time from check-in to start with preoperative SCOUT localization

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1 | INTRODUCTION

Since the 1970s, percutaneous wires have been deployed under mammographic or ultrasonic guidance for preoperative localization of breast abnormalities.[1] Wire localization is performed on the day of surgery to minimize risk of wire displacement or transection. This scheduling requirement introduces multiple challenges including inflexible same-day scheduling, operating room (OR) delays, and increased preoperative patient wait times, decreasing efficiency, and overall patient satisfaction.[2]

In 2014, SCOUT® surgical guidance system (Merit Medical, South Jordan, UT, USA) was introduced as an alternative to wire localization. An antenna-like 12mm SCOUT radar reflector is deployed under image-guidance into the breast abnormality. SCOUT remains entirely within the breast without a percutaneous component. In the operating room, SCOUT reflectors are localized with a handheld radar-based detector which emits an audible signal.[3]

Prior research has demonstrated equivalent surgical and patient outcomes between SCOUT vs. wire localization[4]; given its long-term implant FDA classification, SCOUT may be placed any time before surgery (D Gilstrap, Director, Global Product Management, Merit Medical, 2020, personal communication, 27 July).

This study aims to quantify the day of surgery time savings associated with preoperative SCOUT vs. traditional wire localization in the setting of a moderate volume community hospital.

2 | MATERIALS AND METHODS

2.1 | Patient selection and data collection

Institutional IRB approval was obtained for this HIPAA-compliant study. The requirement for informed consent was waived. A retrospective review of the electronic medical record included all patients who underwent outpatient elective partial mastectomy or lumpectomy for a breast malignancy (DCIS or Invasive) at our institution with either of our two highest volume breast surgeons (subspecialty oncologic breast surgeons with 20 and 35 years in practice, respectively) between August 2013 and June 2019. All patients received preoperative lesion localization with either SCOUT before or wire localization on the day of surgery. Twelve patients were excluded from our analysis for inconsistent or unusable data (ie, OR check-in times later than start times, check-in time ≤ 30 minutes from scheduled OR start time).

757 unique cases were included; 459 used SCOUT for preoperative lesion localization vs. 298 wire localizations. Data abstracted from the electronic medical record included check-in time on the day of surgery and actual operating room (OR) start times.

2.2 | Statistical analysis

Differences between check-in times and actual OR start times were calculated for all SCOUT and wire cases. Mean and median

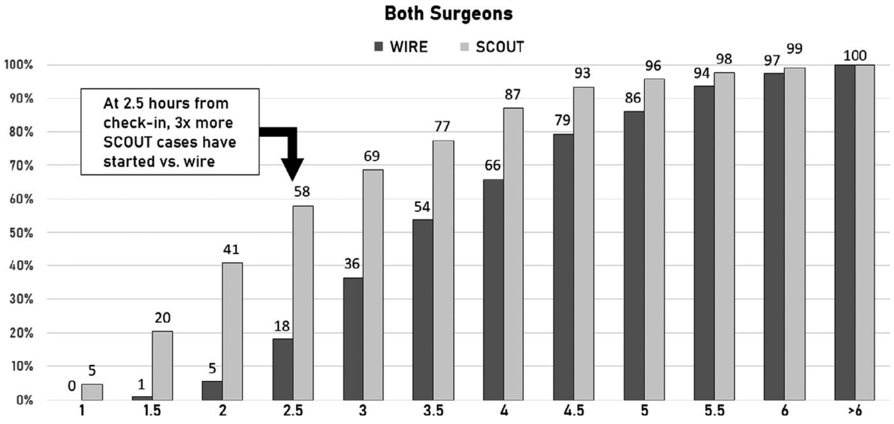

FIGURE 1 Percentage of started cases over time by technique: both surgeons

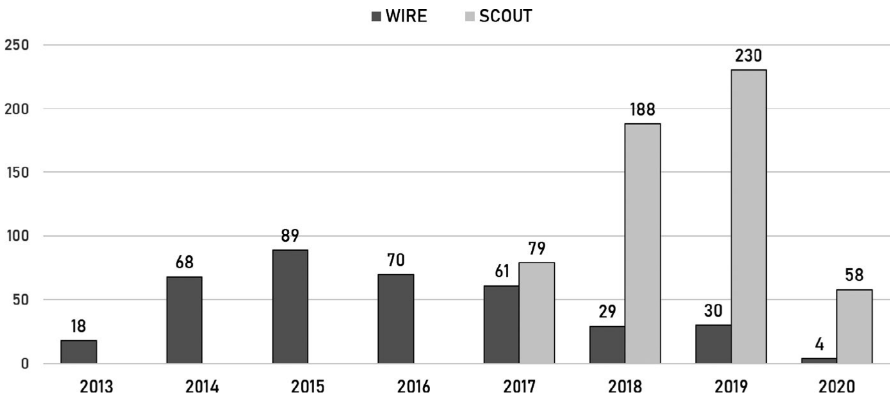

FIGURE 2 Case volume over time by technique: both surgeons

differences in check-in times to OR start times per technique were compared using a two-tailed t-test. All statistical analyses were performed with the R Project for Statistical Computing (http://www.r-project.org/).

3 | RESULTS

3.1 | SCOUT

A total of 459 patients utilized SCOUT preoperatively. Mean time from check-in to actual OR start time on the day of surgery was 152 minutes (median 133 min, stdv 73 min). Average 1st case delay was 8 minutes. 25% of SCOUT cases began “late” (≥10 minutes delay from scheduled start time); only 6% of SCOUT cases started “very late” (≥60 minutes delay). SCOUT cases started an average of 11 minutes early and finished an average of 19 minutes ahead of schedule. SCOUT reflectors were placed a mode of 4 business days preoperatively (mean: 7.5, median: 6, range: 2-29 days).

3.2 | Wire localization

A total of 298 patients utilized wire localization preoperatively. Mean time from check-in to actual OR start time on the day of surgery was 214 minutes (median 204 min, stdv 72 min). Average 1st case delay was 49 minutes. 53% of wire cases began “late” and 22% began “very late.” Wire cases started an average of 15 minutes late and ended 9 minutes behind schedule.

4 | CONCLUSION

Preoperative SCOUT lesion localization significantly improved time from patient check-in to actual OR start time on the day of surgery vs. wire localization at our institution. SCOUT cases saw check-in time to actual OR start time reduced by a mean of 62 minutes (median 71 min) ($p<.001$) with a 53% reduction in “late” and 73% reduction in “very late” start times. SCOUT cases started within 2.5 hours of check-in 3x more frequently than wire localization cases (Figure 1). The average SCOUT case started 26 minutes early and ended 28 minutes before the average wire case. Prior research suggests operative times for SCOUT seed vs. wire localization are similar, resulting in a net time benefit for the patient and surgeon on the day of surgery.[5]

Informal patient and author consensus suggests that both prefer shorter fasting duration preoperatively, shorter surgical days, and fewer scheduling complications realized when using SCOUT. Further study is needed to quantify the dollar value of these efficiencies; however, given recent cost estimations of OR time averaging 36 to 37 dollars per minute, 20 to 21 dollars of which reflect “direct” or short-term modifiable expenses, time savings can realize thousands of dollars in efficiency gains[6].

Limitations of the current study include the lack of lesion-specific data, lack of patient demographic information, and lack of documented radiologist experience level for comparison between SCOUT vs. wire populations. Given the relatively complete transition from wire localization to SCOUT at our institution (2016: 100% wire; 2018: >87% SCOUT), any potential patient population differences are assumed to randomize (Figure 2). Additionally, we lack complete information regarding technology used for localizer placement. Author consensus is that the vast majority of cases were placed using either ultrasound or mammographic guidance.

ACKNOWLEDGEMENTS

We thank the patients who participated in this study.

DISCLOSURES

Ari D. Brooks, MD has received compensation at a speaker's bureau for Merit Medical (< $5,000). No other disclosures.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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How to cite this article: Trent G, Tong C, Brooks AD, Goodacre R, Sataloff D, Englander B. Improving time from check-in to start with preoperative SCOUT localization. *Breast J*. 2021;00:1–3. https://doi.org/10.1111/tbj.14223