Antithrombotic Therapy

Evaluation of the safety of performing core needle biopsy of the breast without suspending medication

Patrice Cameron, RN, CPN, Jana Lesko, RN, BSN, CMSRN, MAT, and Marla R. London, MA

BACKGROUND: Patients are increasingly presenting for outpatient breast biopsy while taking medically necessary antithrombotic therapy. Cessation of this medication prior to biopsy increases patients' risk of vascular complications.

OBJECTIVES: This article evaluates the safety of performing core needle biopsies of the breast in patients without suspending prescription antithrombotic therapy.

METHODS: In this retrospective chart review study, patients continued prescription antithrombotic therapy prior to and including the day of biopsy. Follow-up telephone assessment, relying on patient self-report, was completed on the same or next business day. The chart review included report of bleeding as a postprocedure complication.

FINDINGS: None of the 42 women who completed core needle biopsy of the breast while on antithrombotic therapy reported postdischarge bleeding, and 2 reported hematoma, supporting the safety of continuing antithrombotic therapy in patients who undergo core needle biopsy of the breast.

KEYWORDS anticoagulants; antiplatelets; antithrombotic therapy; core needle breast biopsy

MAMMOGRAPHY AND SUBSEQUENT BREAST BIOPSY are frequently performed diagnostic interventions. Sixty-seven percent of women aged 40 years or older have had a mammogram within the past two years (National Center for Health Statistics, 2015). More than 30 million mammography procedures are performed annually in the United States (U.S. Food and Drug Administration, 2017). The breast biopsy rate in women screened for breast cancer each year for 10 years is 5%–7% (Dahabreh et al., 2014).

According to the National Center for Health Statistics (2015), the percentage of individuals aged 65 years or older who took a prescription antithrombotic therapy medication in the past 30 days has more than doubled, from 6% in 1988–1994 to 16% in 2009–2012. Patients on chronic antithrombotic therapy to decrease their risk of life-threatening events (e.g., stroke, myocardial infarction, pulmonary embolism) have an additional component of safety for providers to consider (Zhang & Liu, 2017).

All three English-language studies published within the diagnostic imaging specialty since 2000 compared bleeding complications after core needle biopsy of the breast in patients with and without concurrent antithrombotic therapy (Chetlen, Kasales, Mack, Schetter, & Zhu, 2013; Melotti & Berg, 2000; Somerville, Seifert, Destounis, Murphy, & Young, 2008). Melotti and Berg’s (2000) anticoagulation group included patients on warfarin, heparin, and aspirin; Somerville et al. (2008) evaluated aspirin, warfarin, and aspirin/acetaminophen/caffeine (Excedrin®); and Chetlen et al. (2013) compared patients with aspirin, warfarin, clopidogrel, or daily nonsteroidal anti-inflammatory drug (NSAID) use to those in the non-antithrombotic patient group. These studies indicated that antithrombotics did not increase the incidence of clinically significant hematoma formation and that stopping or altering antithrombotic therapy presents medical risks to patients that exceed the procedural bleeding risk (Chetlen et al., 2013; Melotti & Berg, 2000).

Dunn and Turpie’s (2003) systematic review of perioperative management of patients receiving oral anticoagulants identified that, historically, the literature provided limited evidence for guiding practice. A 2005 study by Ilhezue, Smart, Dewbury, Mehta, and Burgess concluded that warfarin need not be discontinued prior to prostate biopsy; however, expert opinions at that time differed about whether the practice change would increase...
patient risk (Ghani, Rockall, Nargund, & Chinegwundoh, 2006; Halliwell, Lane, & Dewbury, 2006; Ramachandran, MacKinnon, Allen, Dundas, & Patel, 2005). Since 2011, the literature has supported the practice of continuing antithrombotic therapy for most patients prior to prostate and thyroid/neck biopsies (Abu-Yousef, Larson, Kuehn, Wu, & Laroia, 2011; Asano, Kobayashi, Yano, Otsuka, & Kitahara, 2015; Chowdhury et al., 2012; Lyle & Dean, 2015).

Based on these findings, in 2011, radiologists at the study institution, Providence St. Vincent Medical Center in Portland, Oregon, changed their biopsy protocol, allowing patients to maintain their routine prescription antithrombotic therapy before and after biopsy. The goal and challenge, both then and now, is to safely perform breast biopsy and obtain adequate tissue sampling while preventing biopsy complications. Previously, biopsy protocols required all patients taking prescribed antithrombotic therapy to modify their routine to achieve an international normalized ratio of 1.3 or less on the day of biopsy. As a result, biopsies were often canceled or rescheduled, inconveniencing the patient and the care team. No changes were made for patients taking only nonprescription antithrombotic therapies because they already maintained their therapy before and after biopsy.

The current study was a retrospective chart review at a community-based tertiary medical center of patients who underwent core needle biopsy of the breast while on antithrombotic therapy from 2011 to early 2016 to assess the impact of changing the protocol on bleeding complication rates. This study includes newer antithrombotic therapies and aims to evaluate the safety of performing core needle biopsies of the breast in patients without suspending prescription antithrombotic therapy.

**Methods**

Before scheduling their biopsy, patients spoke with a nurse navigator either in person or over the telephone. The nurse navigator discussed bleeding, hematoma, bruising, and postbiopsy self-care

**TABLE 1.**

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>MELOTTE &amp; BERG, 2000</th>
<th>SOMERVILLE ET AL., 2008</th>
<th>CHETLEN ET AL., 2013</th>
<th>CAMERON ET AL., 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescription</td>
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<td></td>
</tr>
<tr>
<td>Apixaban (Eliquis®)</td>
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<td>–</td>
<td>–</td>
<td>×</td>
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<tr>
<td>Clopidogrel (Plavix®)</td>
<td>–</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>Dabigatran etexilate (Pradaxa®)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Dipyridamole (Aggrenox®)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>X</td>
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<tr>
<td>Enoxaparin (Lovenox®)</td>
<td>X</td>
<td>–</td>
<td>–</td>
<td>X</td>
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<tr>
<td>Rivaroxaban (Xarelto®)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>X</td>
</tr>
<tr>
<td>Warfarin (Coumadin®)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Over-the-counter</td>
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<td></td>
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<tr>
<td>Aspirin</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>Aspirin/acetaminophen/caffeine (Excedrin®)</td>
<td>–</td>
<td>X</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Nonsteroidal anti-inflammatory drugs</td>
<td>–</td>
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</table>
instructions. In addition, the nurse navigator informed patients that the radiologist does not require them to suspend or alter their antithrombotic medications and encouraged them to discuss their antithrombotic therapy with their usual provider.

Core needle biopsy of the breast was performed by radiologists using either ultrasound or stereotactic guidance. In September 2015, stereotactic guidance was upgraded to 3D mammographic images. To ensure adequate tissue sampling, radiologists used vacuum-assisted devices: 9 gauge for stereotactic biopsies and 12 gauge for ultrasound biopsies.

After obtaining the tissue, providers followed the institution’s standard protocol, including placement of a breast marker and application of firm C-clamp compression, which was used to minimize bleeding and was followed by a skin adhesive. When homeostasis was achieved, a postbiopsy mammogram was performed to verify breast marker placement. A compression bandage was applied, and the patient was instructed to keep the bandage on overnight. Prior to discharge, patients received self-care instructions, including expected drainage amounts, the possibility of bruising, and the use of an ice pack for 10 minutes per hour for four hours. The nurse navigator telephoned each patient on the same or next business day to assess complications and address any questions or concerns.

This retrospective chart review study involving patients who were on antithrombotic therapy at the time of breast biopsy and examining bleeding complications was approved by the institution’s institutional review board. Patients undergoing a vacuum-assisted breast biopsy procedure from January 1, 2012, to March 31, 2016, were included if they were taking one or more of these prescription antithrombotic therapies: apixaban (Eliquis®), clopidogrel (Plavix®), dabigatran etexilate (Pradaxa®), dipyridamole (Aggrenox®), enoxaparin (Lovenox®), rivaroxaban (Xarelto®), and warfarin (Coumadin®) (see Table 1). Over-the-counter medications and herbal supplements were not considered. Documentation was recorded electronically.

A total of 88 patients undergoing breast biopsy on antithrombotic therapy prior to biopsy at the study institution were considered for inclusion. Of these, 16 patients were excluded because they suspended or modified their antithrombotic therapy prior to biopsy. An additional 16 patients were excluded because their chart did not verify their antithrombotic therapy use on the day of biopsy.

Data collected for the remaining 56 patients included the following:

- Patient identifiers (name, medical record number)
- Demographic information (gender, date of birth)
- Biopsy procedure characteristics (date; provider; laterality; specific procedure, including ultrasound and stereotactic)
- Prescription antithrombotic medication
- Postbiopsy complication status (bleeding, hematoma, neither)
- Confirmation of current antithrombotic therapy and presence of postbiopsy complications were obtained via telephone by nurse navigators as early as two weeks before the procedure and the same or next business day after the procedure. Current antithrombotic therapy was also confirmed by a technologist at the biopsy appointment. Postbiopsy information, obtained via telephone, was categorized into the following patient responses:
  - Postdischarge bleeding
  - Hematoma
  - Neither bleeding nor hematoma
  - Patient says that she is fine.
  - Unable to reach

Because some of the included medications do not require international normalized ratio monitoring, clotting times were not reviewed (Ciurus, Sobczak, Cichocka-Radwan, & Lelonek, 2015).

Based on the chart review, 12 patients were excluded because they did not have a postbiopsy telephone call documented, and 2 patients were excluded because their postbiopsy telephone call occurred later than the next business day after their biopsy. As a result, the final study population consisted of 42 patients. Data were stored in an electronic spreadsheet, and the descriptive analysis was performed within the spreadsheet.

Findings
The average age of the 42 patients was 70.1 years (SD = 10.9), with a range of 43–90 years. All patients were women. Because five patients had two biopsy sites on the same date, the 42 patients had a total of 47 biopsy sites (see Table 2).
After the procedure, according to patient self-report, two of the biopsy sites indicated hematomas, neither of which required additional intervention, and, overall, none caused significant bleeding. Among the 42 women, 2 reported that they had a hematoma, 16 confirmed that they had neither bleeding nor a hematoma, 17 gave a nonspecific response (e.g., “I’m fine”), and 7 were left a telephone message but did not return the call. Based on preprocedure patient teaching, nonspecific or unreturned telephone calls suggested no complications.

Discussion
The results of the current study (i.e., a hematoma rate of 4% and no additional hematoma-related intervention or postdischarge bleeding) suggest that continuing antithrombotic therapy for core needle biopsy of the breast is safe. This study reinforces a growing body of evidence supporting the safety of maintaining antithrombotic therapy prior to breast biopsy; the risk of a bleeding complication is low, whereas the risks that stem from interrupting the antithrombotic therapy are high (Chetlen et al., 2013; Melotti & Berg, 2000; Somerville et al., 2008). Newer antithrombotic agents have emerged in the past decade, validating the importance of this practice change.

Although 47 biopsy sites in 42 patients represents a small percentage of the study institution’s population, findings from the current study are consistent with published articles about the safety of continuing antithrombotic therapy (Chetlen et al., 2013; Melotti & Berg, 2000; Somerville et al., 2008). In addition, the number of patients taking prescription antithrombotic medications will likely increase (National Center for Health Statistics, 2015).

The retrospective nature of the current study revealed practice and documentation inconsistencies that have since been improved at the study institution. For example, although technologists consistently followed protocol and reviewed medications and allergies with patients prior to the procedure, some technologists were not familiar with newer antithrombotic therapies. This gap in knowledge prompted a need for additional staff education about these therapies, particularly regarding appropriate documentation of medication use and awareness of bleeding possibility during and after biopsy.

In addition, consistent postprocedure telephone calls made to patients began in mid-2012. Previously, such telephone calls were inconsistently made. Beyond the breast center nurse navigators, diagnostic imaging nurses at the study institution have now initiated postprocedure telephone calls for their patients.

In the study institution in 2016, the hematoma rate for ultrasound biopsies was 1.5% (8 reported hematomas from 543 biopsies performed), as compared to a 4% hematoma rate during the study period. The institution’s ultrasound hematoma rate is calculated immediately postbiopsy; as a result, there may have been additional hematomas that patients did not report after the procedure. However, further review to assess demographic or clinical consistency between the 2012–2016 antithrombotic population and the 2016 ultrasound population has not been performed. Although the practice of continuing antithrombotic medications during biopsy has been demonstrated to be safe, the biopsy team must be prepared for bleeding events that can happen with or without antithrombotic therapy.

Limitations
Although this study included only prescription antithrombotic therapies, patients’ use of over-the-counter products (e.g., aspirin, other NSAIDs, herbs or supplements with antithrombotic effects) was not considered, nor were therapeutic range or adherence. Future studies could explore the impact of these products and issues. Another limitation of this study is that it relied exclusively on patient self-report. Mammographic assessment of postbiopsy hematoma formation could yield more definitive results.

Conclusion
This study examined the rate of bleeding complications in patients on antithrombotic therapy receiving core needle biopsy of the breast. These results, consistent with other published studies, support the safety of this practice. A larger study is needed to strengthen these findings. Maintaining antithrombotic therapy will allow nurses and other clinical staff assuming care for patients after biopsy to focus on the biopsy results and treatment plan without the need to adjust and monitor these medications.

Patrice Cameron, RN, CPN, is a recently retired breast nurse navigator, Jana Lesko, RN, BSN, CMSRN, MAT, is a professional development specialist, and Marla R. London, MA, is a manager of clinical performance support, all at the Providence St. Vincent Medical Center in Portland, OR. London can be reached at marla.london@providence.org, with copy to CJONEditor@ons.org. (Submitted January 2017. Accepted April 28, 2017)

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REFERENCES


