Clinical Viewpoint: Mammotome elite® in Ultrasound-Guided Breast Biopsy

The methods of diagnosing breast disease have continuously changed over the last few decades. During this time, standard diagnostic technique has evolved from open surgical biopsy to minimally invasive breast biopsy [MIBB] which provides a confident diagnosis while minimizing procedure time, cost and morbidity. *(1, 2, 4-6)*

MIBB then further evolved from cytology (fine needle aspiration [FNA]) to histology (14-gauge core needle biopsy [CNB]) and continued from CNB to vacuum-assisted biopsy [VAB]. This transition from FNA to VAB has been driven by the increased histological accuracy provided by larger tissue samples that enable pathologists to provide definitive diagnoses and biological parameters to guide treatment planning. *(1,3,6)*

In both stereotactic-guided and MRI-guided breast biopsies, VAB is the current standard of care. However, in ultrasound-guided breast biopsy, the transition from CNB to VAB still continues. Initially, VAB devices were not easy to use in ultrasound-guided procedures. However, with the introduction of Mammotome elite®, physicians now have access to vacuum-assisted biopsy tissue quality with the ease-of-use and speed of a core needle.

As always, the device a physician chooses to use should depend on how confident the physician is that the device will provide tissue acquisition of sufficient quality to confirm a diagnosis. *(1,6,7)* To aid in that decision, this clinical viewpoint provides a summary of published evidence on MIBB devices used in ultrasound-guided breast biopsies.

Acquiring More Tissue Reduces Underestimation:

"Some lesions are histologically heterogeneous: For example, they may contain areas of both atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS) or DCIS and infiltrating carcinoma. In such lesions, the sample obtained percutaneously may not be representative of the most aggressive and clinically important area of the lesion. Directional vacuum-assisted biopsy instruments, which obtain larger volumes of tissue than 14-gauge automated needles, usually result in significantly lower frequencies of histologic underestimation, particularly when at least 10 specimens are obtained."

Morris EA et al. Histologic Heterogeneity of Masses at Percutaneous Breast Biopsy, The Breast Journal, Volume 8, Number 4, 2002 187-191

"In the evaluation of small lesions (approx. diameter 5-10 mm), the use of Tru Cut CB carries a moderate risk of inadequate sampling."

Abbate F et al., Ultrasound-guided vacuum-assisted breast biopsy: Use at the European Institute of Oncology in 2010 Journal of Ultrasound, Volume 14, Issue 4, December 2011

Core needle biopsy tends to underestimate tumor grade. One study found "About a quarter (24%) of all biopsies were upgraded at surgery, whereas only 7% were downgraded."

Zheng J et al., Invasive Ductal Carcinoma of the Breast: Correlation Between Tumor Grade Determined by Ultrasound-Guided Core Biopsy and Surgical Pathology AJR:200, January 2013

Single Insertion Increases Diagnostic Accuracy:

"With VAB, contiguous samples can be collected without multiple needle insertions, and this increases the likelihood of adequate results even when the needle tip is not right in the middle of the target."

Abbate F et al., Ultrasound-guided vacuum-assisted breast biopsy: Use at the European Institute of Oncology in 2010 Journal of Ultrasound, Volume 14, Issue 4, December 2011

"The handheld Mammotome reduces the underestimation of disease. It eliminates the need for multiple insertions, and it reduces the likelihood of epithelial displacement."

Parker et al. Sonographically Guided Directional Vacuum-Assisted Breast Biopsy Using a Handheld Device AJR:177, August 2001

"Repositioning of the probe aperture, which can affect the accuracy of the biopsy results, is not needed in VAB."

Suh YJ et al., Comparison of the underestimation rate in cases with ductal carcinoma in situ at ultrasound-guided core biopsy: 14-gauge automated core-needle biopsy vs 8- or 11-gauge vacuum-assisted biopsy Br J Radiol. 2012 Aug; 85(1016): e349-56.

Non-Firing Devices Increase Patient Safety:

"For ultrasound-guided specimen collection, VAB allows more precise control of the position of the probe, without the excursion that occurs with CB-Tru Cut. This feature reduces the risk of injury to the chest wall during biopsy of deep lesions."

Abbate F et al., Ultrasound-guided vacuum-assisted breast biopsy: Use at the European Institute of Oncology in 2010 Journal of Ultrasound, Volume 14, Issue 4, December 2011

VAB Devices Improve Clinical Outcomes

"VAB devices offer consistent quality tissue samples and subsequent reduced possibility of false negatives as well as underestimation of the disease process."

Simon JR, et al., Accuracy and Complication Rates of US-guided Vacuum-assisted Core Breast Biopsy: Initial Results, Radiology, Vol. 215, No. 3, 2000, pp. 694-697

"We believe that the wireless handheld single-insertion US-guided VAB devices reduce the possibility of false negatives and the underestimation of disease."

Bagnera S et al., New Wireless Handheld Ultrasound-Guided Vacuum-Assisted Breast Biopsy (VABB) Devices: An Important Innovation in Breast Diagnosis Open Journal of Radiology, 2013, 3, 174-179

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5. *Silverstein M, Lagios MD, Recht A, et al. Image-detected breast cancer; state of the art diagnosis and treatment. Journal of the American College of Surgeons, October 2005; 201(4): 586-597*
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tetherless vacuum-assisted biopsy system