

The Effectiveness of the Celero® Ultrasound-guided Core Biopsy Device For Sampling Abnormal Axillary Lymph Nodes

Paige Huber, MD, Radiologist
Anderson Radiology, South Carolina

Introduction

Ultrasound-guided core needle and fine needle aspiration (FNA) biopsies have become accepted procedures for the pre-operative assessment of abnormalities in axillary lymph nodes, determining cancer staging and treatment options. Since almost 80 percent of all biopsies are benign, ultrasound-guided biopsies provide a more efficient and compassionate procedure, in many cases, enabling women to avoid axillary lymph node dissection and its potentially chronic post-operative affects. However, even minimally invasive needle biopsies of the axilla region pose unique challenges requiring high levels of control and precision to avoid the potential of trauma to nerves or blood vessels.

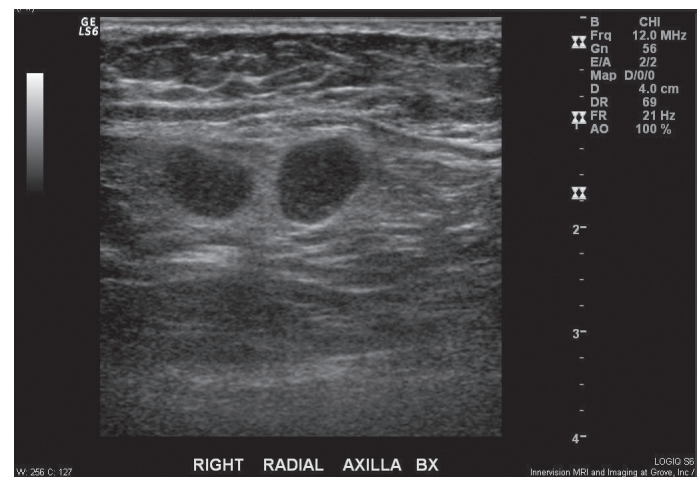
My practice performs over 800 breast biopsies annually, one-third are breast ultrasound. Historically, I had recommended patients for sentinel node biopsies because of the sensitivity of the axilla region and the limitations of the available ultrasound-guided biopsy devices, both core and FNA. The introduction of the Celero® biopsy device, the first, and in my experience, the only vacuum-assisted core biopsy device that allows physicians to pre-fire the needle outside the axilla region, has mitigated the concerns of structural damage from deflection, making core biopsies a safe and effective alternative to sentinel node biopsies.

For the past six years, I have utilized the Celero biopsy device exclusively for biopsies of the axilla region and have found the larger core samples we obtain provide greater diagnostic accuracy than possible with FNA biopsies.

This paper addresses the efficacy of using the Celero biopsy device to perform an ultrasound core needle biopsy of an abnormal right axillary lymph node. The Celero biopsy device enabled us to acquire adequate tissue with a single insertion, which improved diagnostic accuracy, reduced trauma, eliminated unnecessary surgery and provided the patient with a more compassionate procedure.

Core Biopsy of Abnormality In Right Axilla Lymph Node

The unique ability of the Celero biopsy device to fire outside the axilla and acquire sufficient tissue in a single insertion is demonstrated by the recent case of a patient who presented with an abnormal lymph node in her right axilla. The patient had a previous mastectomy of her left breast; and, in her follow-up exam, the PET scan noted increased uptake in her right axilla. The subsequent ultrasound identified two lymph nodes in the axilla, which appeared abnormal, having lost their normal fatty hilum. The patient was referred for a surgical biopsy, but faced with the possibility of additional surgery and chose instead to have an ultrasound-guided biopsy.



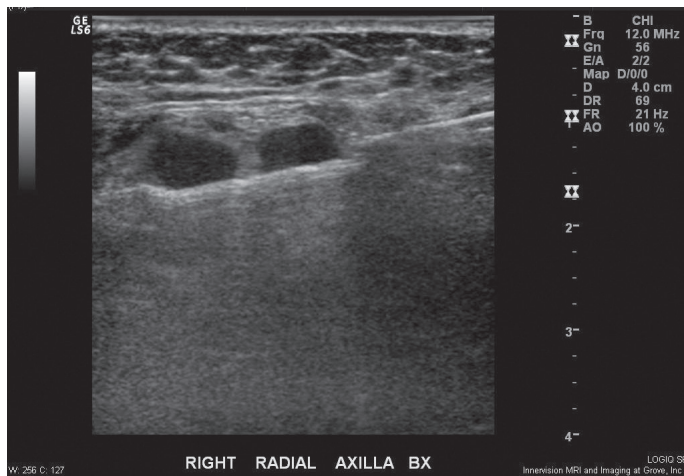
Ultrasound image of axilla prior to biopsy

Using the Celero 12-gauge needle, I was able to sample both lymph nodes simultaneously with a single core. The ultrasound-guided biopsy saved this patient from unnecessary lymph node dissection, which would have been particularly stressful for this patient because of her previous mastectomy.

Core Biopsy or FNA

Often, because of the potential of trauma to nerves or blood vessels in the axilla, physicians choose to perform an FNA. This is a less desirable option in terms of diagnostic accuracy, and the likelihood persists that patients ultimately will undergo axillary lymph node dissection. The acquisition of cells, rather than tissue as in core biopsies, limits pathologists' ability to present a conclusive diagnosis. FNA also requires multiple insertions to obtain an adequate sampling of cells, increasing the risk of trauma each time the needle is inserted in the axilla region and extending the length of the procedure.

The larger samples obtained by core biopsies enable pathologists to give a more accurate diagnosis of a malignant or benign lymph node and to do additional testing on the tissue to determine cancer staging and appropriate treatment.



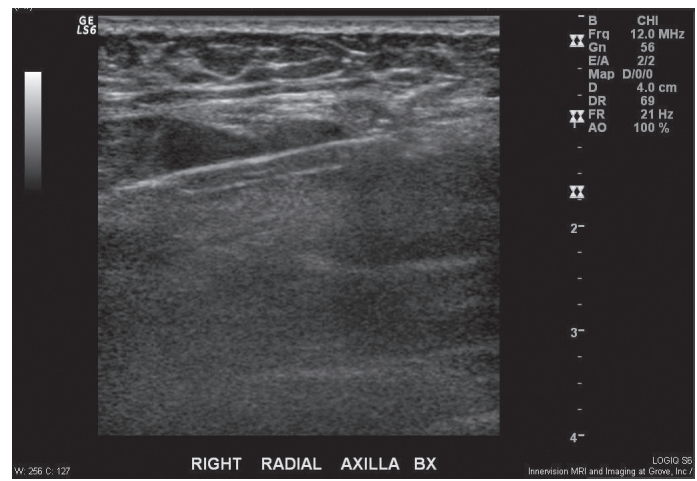
Suspicious lesions in the Celero device aperture prior to biopsy

Directional Control of the Needle

Most core devices require physicians to insert and position the needle and then fire the device. With a deflection of between 1.5 to 1.8 centimeters up and down, these devices pose the risk of trauma by hitting a structure inside the axilla. The Celero device is unique in that it can be fired outside or inside the breast. I fire it inside if the patient has a large, hard lesion of at least two centimeters, which requires firing power to penetrate the lesion.

In order to sample the lymph nodes in the axilla, I pre-fired the inner cannula and advanced the needle in the open position, ready to sample, which gave me greater precision

and directional control of the needle. When the Celero device was in place, I was able to sample both lymph nodes, without any movement of the needle in the axilla.



Ultrasound image of Celero device after acquiring tissue

Efficient Acquisition of Large Tissue Samples

This case was unusual in that the patient's lymph nodes were abnormal in appearance but not enlarged. Normally, when we sample lymph nodes they are greater than 1.5 centimeters in size, these lymph nodes were less than one centimeter each and located next to each other. The biopsy trough on the Celero device is 2 centimeters, so, with the Celero device's 12-gauge needle, we were able to sample both nodes with a single core. The Celero's vacuum pulled the tissue in and held it in place during acquisition, enabling us to acquire the core with one needle insertion.

We acquired enough tissue with the core biopsy for the pathologist to make an accurate diagnosis, determining if the lymph nodes were malignant or benign and what type of cancer was present. The sample was also large enough for the pathologist to check estrogen receptor (ER), and progesterone receptor (PR) status. This changed the treatment for the patient. She received a diagnosis much faster because the oncologists had conclusive information from the pathology report to determine the most appropriate chemotherapy treatment.

The ability to acquire an adequate sample with a single insertion of the Celero device reduced the risk of complications, reduced the duration of the procedure to less than five minutes, and improved patient comfort.

Reducing Nodal Dissection

In my practice, I find one of the greatest advantages of the Celero device is reducing the number of patients who need axillary lymph node dissection. Previously, nodal dissection was the primary treatment for patients with positive lymph nodes. However, as treatment options have evolved, minimally invasive preoperative assessment of abnormal axillary lymph nodes has become more critical to help patients avoid surgery and its long-term effects.

In this case, based on the patient's previous mastectomy, using a core biopsy to sample the nodes provided a more compassionate experience, ultimately saving the patient from additional surgery.

Conclusion

Based on my experience, core needle biopsy is the preferred option for sampling lymph nodes located immediately adjacent to major vessels in the axilla region. Its pre-fire option provides the precision and control necessary to avoid trauma to major structures and its large core samples provide the pathologic information physicians need to treat patients without potentially unnecessary nodal dissection.

Dr. Paige Huber is a board certified radiologist at Anderson Radiology in South Carolina with 15 years experience in diagnostic radiology.

