

AMULET™ INNOVALITY MAMMOGRAPHY SYSTEM TECHNOLOGY REVIEW



women)health



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An interview with Fujifilm's Clinical Applications Specialist Rafca El Khoury "The Significant Value of the Lateral Needle Approach In Tomosynthesis Guided Breast Biopsy procedures"

Christiane: Hello Rafca, I know you are very passionate about the importance of understanding the possibilities our customers do have with the use of the biopsy function in our AMULET™ Innovality mammography systems. Since Fujifilm provides the vertical as well as the lateral needle approach, we know that most clients are very familiar with the use of the vertical needle approach. But you would like to highlight the benefits of using the lateral needle approach in breast biopsy procedures.

Rafca: Yes, that is correct Christiane, as a clinical application specialist promoting the use of the lateral needle approach in mammography breast biopsy procedures, I would like to emphasize the importance of this approach in daily cancer detection practice.

The lateral needle approach is a reliable technique that allows for the safe and accurate removal of suspicious breast tissue for histo-pathology analysis, yet it is sometimes rejected by clients since they might not comprehend the amazing opportunities and thus this tool needs extended education.

Furthermore, the use of upright tomosynthesis-guided and stereotactic-guided biopsy systems, such as the AMULET Innovality mammography system, offers more flexible patient and breast positioning as well as two different approaches for the biopsy needles. Compared to the prone table, the upright system enables us to perform difficult cases, such as small breasts, deep lesions, and superficial lesions, that are typically rejected in the prone position. Additionally, it offers mammographers more possibilities of positioning to prepare the patient and the breast for the radiologist to have an, accurate, and comfortable biopsy procedure.

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Christiane: Rafca, what message would you like to give to our clients for the preparation procedures of breast biopsies in their facilities?

Rafca: The importance of proper biopsy site preparation cannot be overstated, and the use of the lateral needle approach offers several benefits. The approach involves inserting the needle parallel to the flat panel detector, regardless of breast thickness, making it a preferred approach for patients with breast thickness under 30mm or for deep and difficult-to-access lesions.

Christiane: So you mean to say that a biopsy procedure has to be well communicated before the event with all stakeholders involved including the patient?

Rafca: Yes this is correct. Mammographers work with radiologists to verify the previous mammogram of the patient and determine which patient and breast positioning and needle approach will be the easiest and most accurate while taking into consideration the necessity of choosing the shortest access from the skin to the lesion. The AMULET Innovality mammography system provides the ability to alternate between several procedures without the need for recalibrating the needles. We can perform Hook wire localization, Core Needle Biopsy using 14 Gauge, as well as CNB with 12 Gauge, which is a cost-effective yet efficient option without any vacuum system. The most efficient procedure, of course, would be the Vacuum Assisted Biopsy, yet we do see that budget constraints make clients fall back to the Core Needle Biopsy systems especially when biopsy procedures are not performed on a highly regular agenda.

Christiane: I see you have some pictures prepared for us to understand.

Rafca: To have a better understanding of the biopsy site preparation, let us take a look at Figure 1. I am using color codes to identify three essential aspects.

*Patient positioning can be either sitting, decubitus lateral left, or decubitus lateral right (in Green).

*Breast positioning can be either craniocaudal, mediolateral, or lateromedial (in Pink).

*The Biopsy needle Approach can be Vertical, perpendicular to the flat panel detector, or Lateral, parallel to the flat panel detector either from its right or left side (in Red).

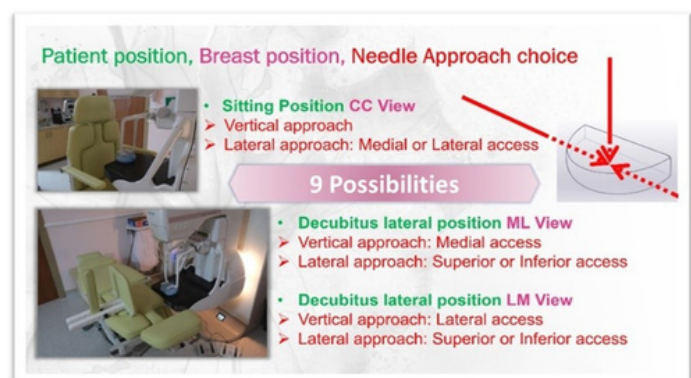


Figure 1: Patient positioning, Breast positioning, and Biopsy needle approach choice in the Upright mammography system.

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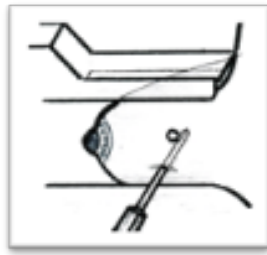
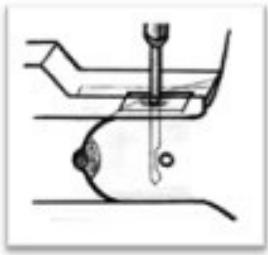


Figure 2: Vertical approach

Figure 3: Lateral approach

Taking a closer look at biopsy approaches, the vertical approach involves inserting the needle perpendicular to the detector, as shown in Figure 2. This approach can be smooth if the breast thickness is over 30 mm and the lesion is not deep.

Figure 2: Vertical approach

Figure 3: Lateral approach

However, if the breast thickness is under 30 mm or the lesion is deep, superficial, and difficult to access, the lateral approach is preferred. In this approach, the needle is inserted parallel to the detector, as shown in Figure 3, and can be used regardless of breast thickness.

Here are examples of both approaches:

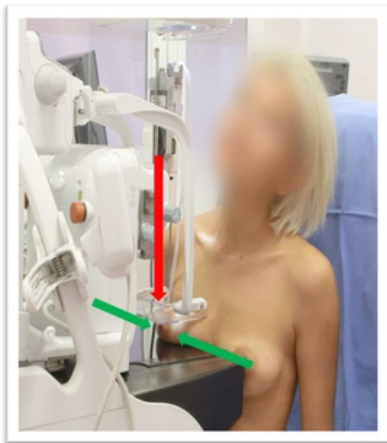


Figure 4: Sitting position

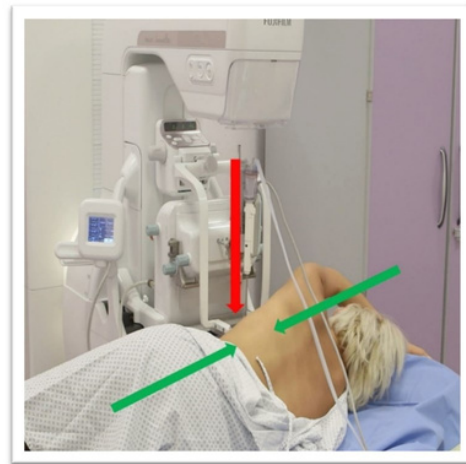


Figure 5: Decubitus lateral position

Figures 4 and 5 courtesy of IRCCS Ospedale Sacro Cuore Don Calabria - Dr Anna Russo, Diagnostic Imaging Department

Figure 4: Patient in an upright sitting position, breast placed in craniocaudal view. The red arrow shows the direction of the vertical needle approach, and the green arrows show both possibilities of lateral biopsy needle approaches (medial and external accesses) to the breast.

Figure 5: Patient positioning decubitus lateral right, left breast is positioned in lateromedial view. The red arrow shows the vertical biopsy needle approach, and the green arrows show both possibilities of lateral needle approaches (superior and inferior accesses) to the breast



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One of the challenging cases we faced involved a patient with two highly suspicious microcalcification clusters located in the upper outer quadrant of the right breast, with a breast thickness of 34 mm in CC and 41 mm in MLO. To perform two biopsies, we opted for different patient positionings. For the first site, the patient was sitting with the right breast in craniocaudal view, and we used the lateral approach to insert the biopsy probe from the external side of the breast. The second site was more critical, so we positioned the patient in decubitus lateral left, with the right breast in lateromedial view. We used the lateral arm to insert the biopsy needle from the upper side of the breast to access the target from the shortest distance from skin to target.

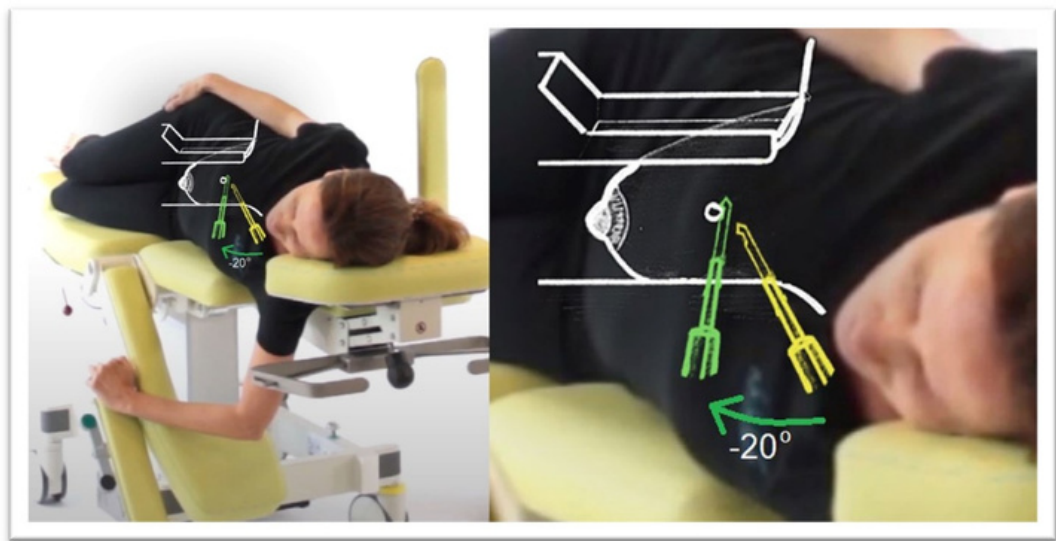


Figure 6: Angulation of the lateral arm allowing easier and safer access to the challenging biopsy targets.

We could have used the same sitting position, craniocaudal view, and lateral approach from the external side of the breast. However, we opted to switch to the decubitus lateral left position as it was more comfortable for the patient, and we could easily access the cluster of calcifications with the lateral arm from the upper side of the breast while in lateromedial view. To avoid the patient's face, we angulated the arm -20 degrees, as shown in Figure 6, moving from yellow to green direction.

However, in many cases, we face several challenges, including avoiding the patient's face if we accessed from the upper side, the patient's belly if we access from the lower side. Sometimes we have to avoid the areola, other times we have to stay away from the pectoral muscle and/or the implant when the lesion is too deep, and finally when the lesion is very superficial. In all these cases, the angulation of the lateral arm is our best option.

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Figure 7 displays the craniocaudal positioning view with the needle placed in the direction of a lateral approach inserted from the external side of the breast, biopsy of the 1st site. The right image visualizes the lateromedial view with the biopsy needle inserted from the upper side of the breast with angulation of -20 degrees, biopsy of the 2nd site.

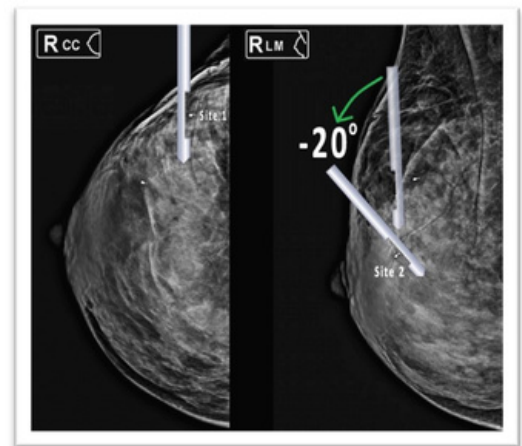


Figure 7: craniocaudal view site 1 - lateromedial view site 2 post biopsy clips. This is a reconstructed image to display the insertion of the biopsy needles in both sites.

We encountered another challenging case where a patient with breast implants had a suspicious cluster of calcifications in the lower outer quadrant of her left breast. Artificial Intelligence scored 75%. In such cases, the safest approach is the lateral approach, where the arm is angled to avoid the implant, as shown in Figure 8.

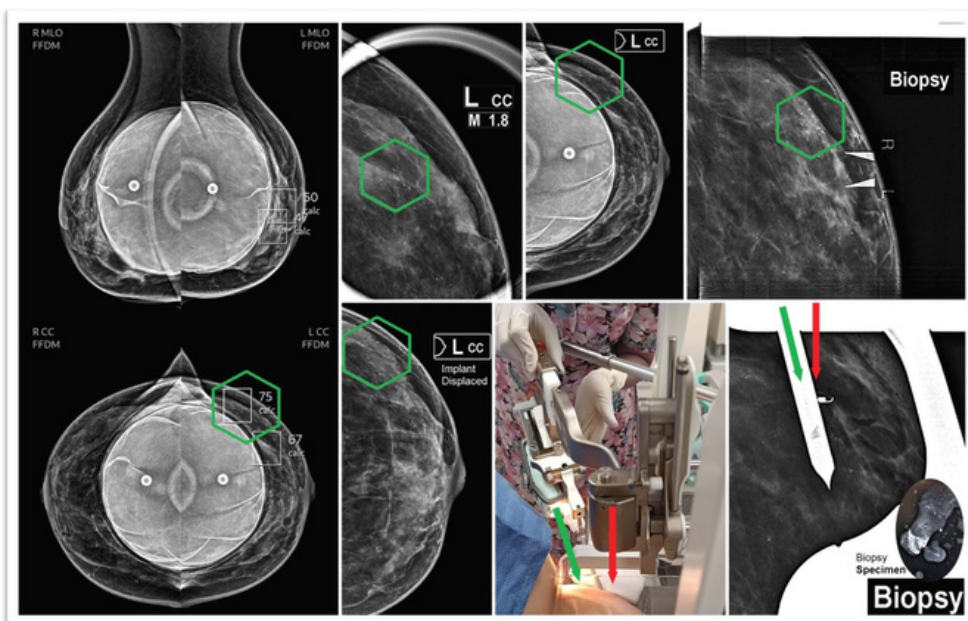


Figure 8: Green Hexagons highlighting the suspicious cluster of calcifications. The red arrows show the lateral approach with a stiff arm, while the green arrows show the angulated insertion of the biopsy probe with Amulet Innovality mammography system's unique lateral arm. The Specimen Xray shows the calcifications extracted.



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The flexibility of the lateral arm is a standout characteristic of AMULET Innovality mammography system.

The AMULET Innovality mammography system offers a unique feature, the angulation of the lateral arm, which allows for smooth access to even the most challenging biopsy targets. Radiologists are encouraged to overcome their hesitation and take advantage of this feature to improve the accuracy and success of their biopsy procedures. Mammographers can also plan for a smoother procedure by ensuring proper patient positioning, selecting the appropriate approach based on breast thickness and lesion location, and utilizing the angulation of the lateral arm as needed.

Christiane: I do understand that utilizing the lateral needle approach benefits the client and the patient in various scenarios. I believe with the crucial information you have just provided clients might open their minds towards the usage of this functionality.

Rafca what would be your takeaway message to all of the readers?

Rafca: My advice for both radiologists and mammographers who have the lateral arm stored and forgotten somewhere in their mammography rooms: Please do not hesitate to reach out to our clinical application team, we would be more than happy to guide you with tips and tricks to be able to perform all the biopsies, and not reject any case due to the limitations of the vertical approach. We will continue offering you the best support and the best solutions for you and your valuable patients!

Finally, the best way to validate my point of view about the value of the lateral arm is by sharing some of our end users' testimonials after practicing together the lateral approach biopsies on AMULET Innovality mammography system.

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Ms. Bethan Williams
Consultant Radiographer at NHS, Wales

“We have had the lateral arm for about 6-7 years. We first used it shortly after upgrading our unit to the Fuji Amulet. We were successful but we’re not fully aware of all of its benefits.

We used it a handful of times but we’re not fully confident. Fujifilm application specialist came to refresh our training and demonstrated its multiple uses with some excellent examples of where the vertical approach may have limitations and how the lateral arm can eliminate these and give more flexibility aiding a better experience for the patient.”



Dr. Shereen Abdelhady
Radiologist at KIMS Health Hospital, Oman

“We have recently installed the newest version of AMULET Innovality mammography system at our facility. And among the stereotactic biopsy cases that we have done, we found the lateral approach easier and safer to apply with small breasts as well as in cases where the suspicious lesions are located at the lower inner quadrant, so the lateral approach on craniocaudal breast position offered us smooth and successful biopsy procedures.”

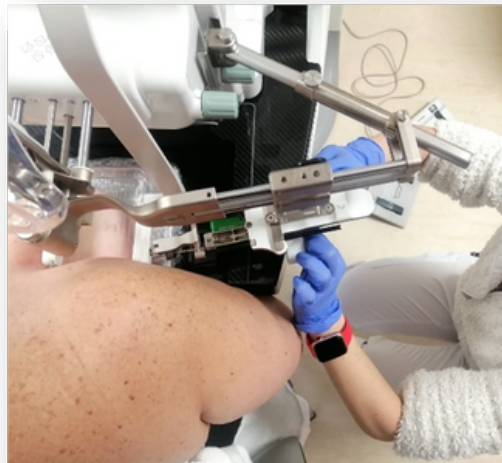


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Dr Nóra Tiba

Radiologist at Borsod-Abaúj-Zemplén Megyei Kórház, Hungary

“We have been using AMULET Innovality mammography system in our institute for two years. Since then we have performed several tomosynthesis-guided stereotactic core needle biopsies in the upright sitting position. In most of the cases, we used the vertical needle approach and rarely the lateral approach. The reason for the latter was that we were not confident enough to use the lateral approach technique routinely. This year during a very intensive, well-structured, and useful training with our clinical application specialist we refreshed, specified, and widened our knowledge and understanding of the usefulness and values of the lateral approach technique. Going through several examples we compared the vertical and lateral needle approach techniques and we clarified the advantages and benefits of each method. Now we are excited and looking forward to implementing our advanced knowledge in our everyday practice.”



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