

Breast Tomosynthesis Equipment: Revolutionizing Breast Cancer Detection

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Image Article

Breast cancer is a leading cause of death among women worldwide. Early detection through mammography is crucial for improving survival rates. However, traditional mammography has limitations, such as overlapping breast tissue that can obscure small lesions. Breast tomosynthesis (BT) addresses these limitations by capturing multiple low-dose X-ray images from different angles, creating a 3D volume of the breast. This allows radiologists to view the breast tissue in different planes, reducing the impact of overlapping tissue and improving the detection of small, early-stage tumors.

Understanding breast tomosynthesis

BT is a form of digital mammography that uses a motorized detector to capture multiple images of the breast from different angles. The resulting images are then reconstructed into a 3D volume. This process allows for the visualization of the breast tissue in different planes, which can help identify small lesions that might be missed in a standard 2D mammogram. The 3D volume can be viewed in real-time, allowing the radiologist to adjust the viewing angle to better visualize the area of interest.

Working principles

The working principle of BT is based on the acquisition of multiple low-dose X-ray images from different angles. The detector is moved in a curved path around the breast, capturing a series of images. These images are then reconstructed into a 3D volume using a process called filtered back projection. The resulting 3D volume can be viewed in real-time, allowing the radiologist to adjust the viewing angle to better visualize the area of interest.

Benefits of breast tomosynthesis

- Improved detection:** BT reduces the impact of overlapping breast tissue, allowing for the detection of small, early-stage tumors that might be missed in a standard 2D mammogram.
- Increased sensitivity:** BT provides a more comprehensive view of the breast tissue, increasing the sensitivity of the examination and reducing the risk of false-negative results.
- Lower recall rates:** By providing a more detailed view of the breast tissue, BT can help reduce the number of women who are called back for a second mammogram, which is a common occurrence with standard 2D mammography.
- Enhanced diagnostic accuracy:** The 3D volume allows for a more accurate diagnosis of breast lesions, reducing the risk of overdiagnosis and unnecessary biopsies.
- Patient comfort:** BT uses a motorized detector that moves around the breast, which can be more comfortable for the patient than the traditional mammography technique.

BT is a promising technology that has the potential to revolutionize breast cancer detection. By providing a more comprehensive view of the breast tissue, BT can help improve the detection of small, early-stage tumors, leading to better outcomes for women with breast cancer.

The future of breast cancer screening

As breast cancer remains a leading cause of death among women, the need for more effective screening methods is paramount. Breast tomosynthesis represents a significant advancement in mammography technology, offering improved detection and diagnostic accuracy. The future of breast cancer screening lies in the integration of such advanced technologies, along with personalized medicine and artificial intelligence, to provide a more comprehensive and accurate approach to early detection and diagnosis.

Continued research and clinical trials are essential to fully understand the long-term benefits and limitations of BT. As the technology evolves, it is expected that BT will become a standard part of breast cancer screening, ultimately leading to a reduction in breast cancer mortality and improved quality of life for patients.



Imaging of breast tomosynthesis.

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