

Digital Mammography – High Image Quality at Reduced Dose with Tungsten Tube

Case Study Courtesy of: Thomas Diebold, MD,
University of Frankfurt, Frankfurt, Germany

Special Systems #1

Patient History

SIEMENS

Digital Mammography



- 54 year old female
- Palpable mass on the right upper outer quadrant of the right breast
- Found by self examination

Clinical Challenge: detection of microcalcifications and tumors at lowest possible dose, especially in dense breasts

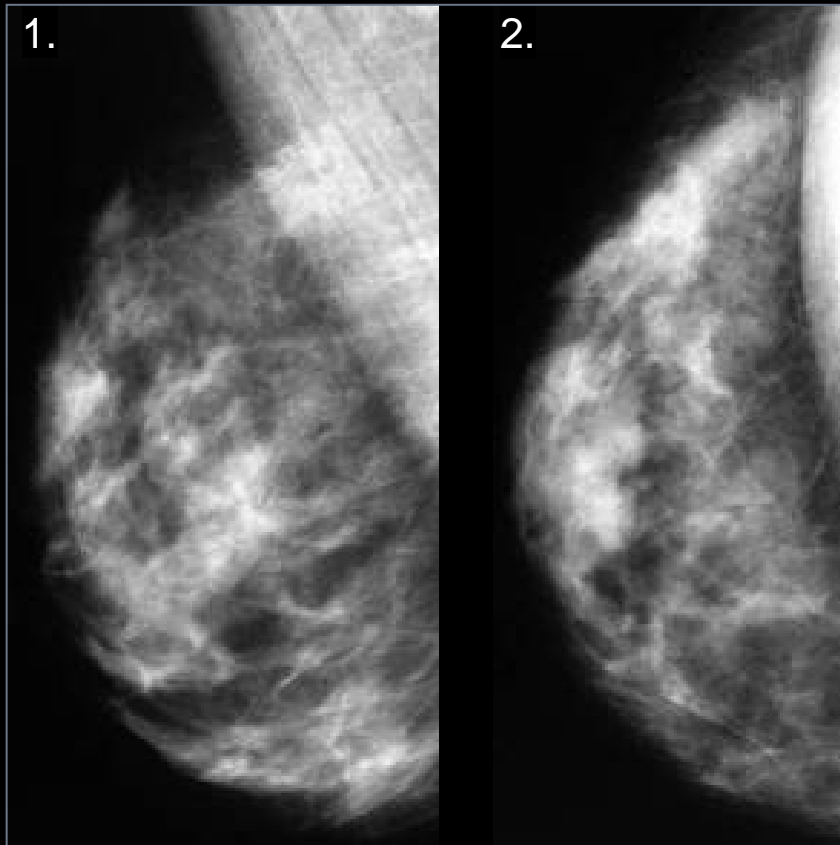
Courtesy of: Thomas Diebold, MD
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Digital Mammography



- Breast cancer is the most common cancer among women (32 percent of all new cancer cases in the US)
- The chance of a woman developing invasive breast cancer is about 1 to 8
- In 2005, about 40,000 women are estimated to have died from breast cancer in the US
- The death rate has declined significantly and medical experts attribute the decline to earlier detection and more effective treatment

Source: American Cancer Society, (ACS), 2005

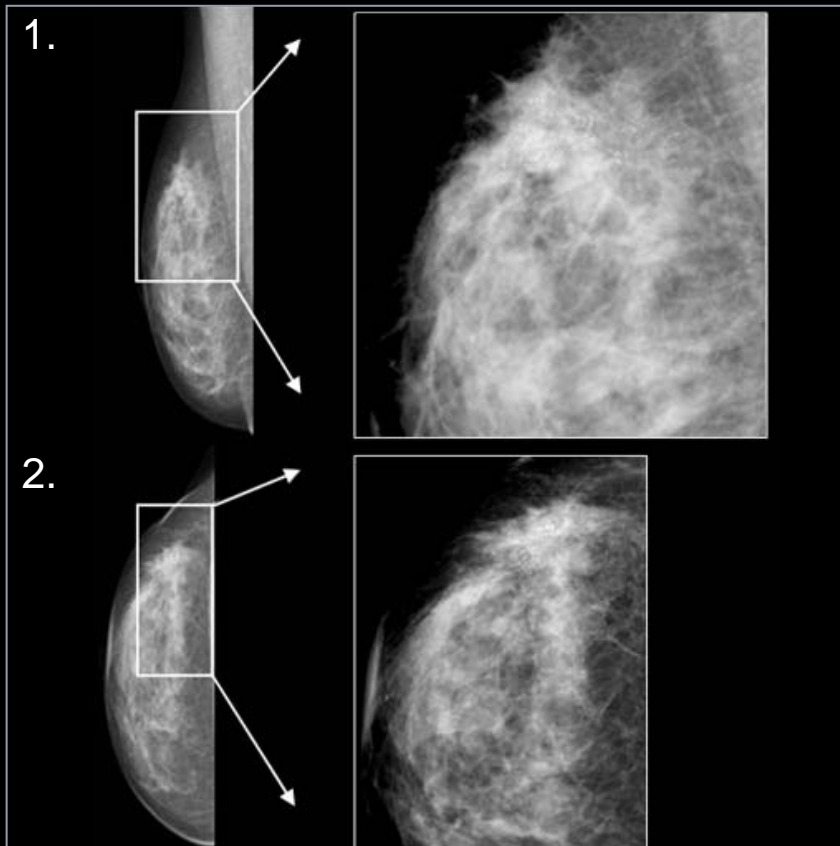


Screen/film mammography with Molybdenum/Molybdenum (Mo/Mo) anode/filter combination (priors from 1 year ago from an external facility)

No microcalcifications recognized

1. MLO view
2. CC view

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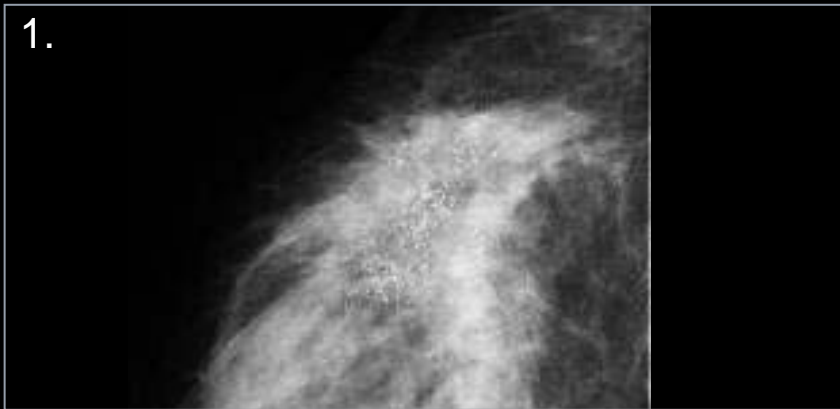
Digital mammography with Tungsten/Rhodium (W/Rh) anode/filter combination (1 year follow-up)

Extensive pleomorphic segmental
BI-RADS V microcalcifications in the upper
outer quadrant. The calcifications are
associated with a huge soft tissue mass

1. MLO view (compression thickness 53 mm, AGD = 0.9 mGy)
2. CC view (compression thickness 55 mm, AGD = 1 mGy)

AGD = average glandular dose

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Digital mammography with W/Rh versus screen/film mammography with Mo/Mo

1. Digital: geometric magnification in MLO view
2. Screen/Film: magnification of the scanned image in CC view



In the retrospective analysis of the screen/film exam a few microcalcifications could have been seen one year ago

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Enabling Technology: Digital Mammography with W/Rh



Increased confidence resulting from increased image quality at low dose

Benefits

- Better image quality – significantly more details by higher image contrast for optimized diagnostics, especially of dense breasts
- Same image quality – with a mean dose reduction of 40 percent compared to Molybdenum/Molybdenum (Mo/Mo)*

* percent of reduction depends on breast thickness

Enabling Technology: Digital Mammography with W/Rh



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Differentiators

- Siemens is the only vendor offering digital mammography with a bimetal X-ray tube with tungsten (W) in addition to the molybdenum (Mo) target

Special Systems #1 Clinical Outcomes

SIEMENS

Digital Mammography



Prevention

Diagnosis

Therapy

Care

- Histology revealed an invasive ductal carcinoma with an extensive in situ component, 2/3 of axillary lymph nodes were positive for metastatic involvement
- Mastectomy had to be performed followed by chemotherapy and radiation therapy
- Digital mammography might have helped to find the tumor earlier

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