ABUS Publication Summary

Publication: Automated Breast Ultrasound in Breast Cancer Screening of Women with Dense Breasts: Reader Study of Mammography-Negative and Mammography-Positive Cancers

Giger ML, Inciardi MF, Edwards A, et al. Am J Radiol. June 2016; 206(6): 1341-1350.

Study Design: Multireader, multicase, sequential-design reader study

Population: 17 MQSA-qualified radiologists (185 cases = 133 non-cancer + 52 biopsy-proven cancers)

Key Outcomes:
- FFDM+ABUS compared to FFDM alone for the mammography-negative cancers (n = 31) resulted in statistically significant improvements in both average AUC and sensitivity
- Change in value with addition of ABUS:
  AUC: 0.15 (P < 0.001); (relative Δ: 25%)
  Sensitivity: 23.9% (P = 0.004); (relative Δ: 62%)
- FFDM + ABUS compared to FFDM alone for the mammography-negative cancers without prior breast interventions (n = 16) resulted in even more pronounced improvements
- Change in value with addition of ABUS:
  AUC: 0.21 (P < 0.001); (relative Δ: 25%)
  Sensitivity: 35.7% (P < 0.001); (relative Δ: 110%)
- Amongst non-cancers (n = 133), FFDM + ABUS compared to FFDM alone resulted in an insignificant change in specificity (FFDM + ABUS 76.2 vs. FFDM 78.1; relative Δ -2.1%; P = 0.496)

Conclusion: The authors concluded that combining mammography with ABUS, compared with mammography alone, significantly improved readers' detection of breast cancers in women with dense breast tissue without substantially affecting specificity.

PDF:
http://www.ajronline.org/doi/pdf/10.2214/AJR.15.15367

Website:
http://www.ajronline.org/doi/abs/10.2214/AJR.15.15367

Publication: Interreader Scoring Variability in an Observer Study Using Dual-Modality Imaging for Breast Cancer Detection in Women with Dense Breasts

Drukker K, Horsch KJ, Pesce LL, et al. Acad Radiol. July 2013;20(7); 847-853.

Study Design: Multireader, multicase, sequential-design reader study

Population: 17 MQSA-qualified breast radiologists (164 cases = 133 non-cancers + 31 biopsy-proven cancers)

Key Outcomes:
- The median change in area under the receiver operating characteristic curve after ABUS interpretation was 0.12 (range 0.04 – 0.19)
- Reader agreement was fair with the median interreader κ being 0.26 (0.05 – 0.48) for XRM-alone and 0.34 (0.11 – 0.55) for XRM + ABUS (95% CI interval for the difference in κ, 0.06 – 0.11)
- Simulated double reading of XRM + ABUS demonstrated tradeoffs in sensitivity and specificity, but conservative simulated double reading resulted in a significant improvement in both sensitivity (16.7%) and specificity (7.6%) with respect to XRM-alone

Conclusion: The authors concluded that a modest, but statistically significant, increase was observed in interreader agreement after implementation of ABUS.

PDF:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3784312/pdf/nihms458541.pdf

Website:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3784312/

Publication: Adding 3D Automated Breast Ultrasound to Mammography Screening in Women with Heterogeneously and Extremely Dense Breasts: Report from a Hospital-based, High-volume, Single-center, Breast Cancer Screening Program

Wilczek B, Wilczek HE, Rasouliyan L, et al. Eur J Radiol. June 2016; 85:1554-1563.

Study Design: Observational workflow study

Population: 1,668 asymptomatic women

Key Outcomes:

- Addition of ABUS to screening mammography yielded an additional 2.4 detected cancers per 1000 women screened (95% CI: 0.6, 4.8; P < 0.001)
- Recall rate per 1000 women screened was 13.8 for FFDSM alone and 22.8 for FFDSM + ABUS, yielding a difference of an additional 9 recalls per 1000 women screened (95% CI: 3.0, 15.0; P = 0.004)

Conclusion: The authors concluded that addition of 3D ABUS to FFDSM in women with ACR3 or ACR4 breast density significantly improved invasive breast cancer detection rate with an acceptable recall increase.

PDF:
http://www.ejradiology.com/article/S0720-048X(16)30176-0/pdf

Website:
http://www.ejradiology.com/article/S0720-048X(16)30176-0/fulltext

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Publication: Assessing Improvement in Detection of Breast Cancer with Three-dimensional Automated Breast US in Women with Dense Breast Tissue: The SomoInsight Study

Brem RF, Tabar L, Duffy SW, et al. Radiol. March 2015;274(3):663-673.

Study Design: Observational, multicenter, multireader, multicase study

Population: 15,318 asymptomatic women

Key Outcomes:

- Addition of ABUS to screening mammography yielded an additional 1.9 detected cancers per 1000 women screened (95% CI: 1.2, 2.7; P < 0.001)
- Of cancer detected with SM, 62.2% (51 of 82) were invasive vs. 93.3% (28 of 30) of additional cancer detected with ABUS (P = 0.001)
- Sensitivity for the combined read, SM + ABUS, increased by 26.7% (95% CI: 278.0, 292.2; P < 0.001)

Conclusion: The authors concluded that addition of ABUS to screening mammography in a generalized cohort of women with dense breasts increased the cancer detection yield of clinically important cancer, but it also increased the number of false-positive results

PDF:
http://pubs.rsna.org/doi/pdf/10.1148/radiol.14132832

Website:
http://pubs.rsna.org/doi/10.1148/radiol.14132832?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed

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Publication: Using Automated Breast Sonography as Part of a Multimodality Approach to Dense Breast Screening

Giuliano V, Guiliano C. J Diagn Med Sonogr. July/August 2012:28 (4); 159-165.

Study Design: Prospective pilot study

Population: 24 asymptomatic women

Key Outcomes:

- BI-RADS® 4 and 5 lesions (n = 24) underwent tissue diagnosis with histologic evaluation, which revealed 15 malignant tumors and 9 benign pathologies
- There was excellent inter-observer agreement, with all breast cancers found by automated breast sonography and MRI correctly categorized as BI-RADS 4 or 5 (kappa values between 0.95 and 0.98)

Conclusion: The authors concluded that this preliminary study offers automated breast sonography is a promising cost-effective adjunct diagnostic modality to MRI in the evaluation of women with increased breast density by digital mammography

PDF: Abstract only: Available for purchase

Website:
http://jdm.sagepub.com/content/28/4/159.abstract

Imagination at work

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