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Clinical Guidelines from the 2025 International Symposium on Breast Diseases of Inland São Paulo: Imaging Assessment and Management of B3 Breast Lesions

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ABSTRACT

Objective: To establish evidence-based clinical guidelines from the 2025 International Symposium on Breast Diseases of Inland São Paulo (SIMIP 2025), addressing four key axes of breast cancer diagnosis and management: indications for preoperative magnetic resonance imaging (MRI), vacuum-assisted excision (VAE) for B3 lesions (breast lesions of uncertain malignant potential), supplemental imaging for dense breasts, and the preferred imaging modality (contrast-enhanced mammography [CEM] or MRI) for high-risk women. **Methods:** Each axis was presented in evidence-based lectures, followed by debates and anonymous electronic voting by 100 specialists. Consensus was defined as ≥75% agreement. **Results:** Preoperative MRI was recommended for selected cases (100% in favor), including invasive lobular carcinoma, dense breasts, and occult carcinoma. VAE for B3 lesions received 98% support, except for phyllodes tumors and papillary lesions with atypia. Supplemental imaging for dense breasts was unanimously endorsed (64% preferred MRI, 36% voted for ultrasound). For high-risk women, MRI was chosen by 100%, with CEM as an alternative. **Conclusion:** The guidelines reinforce MRI for selected preoperative cases and high-risk screening, emphasize VAE as an effective approach for managing B3 lesions, and advocate for supplemental imaging (preferably MRI) for dense breasts, with multidisciplinary decision-making.

KEYWORDS: breast cancer; magnetic resonance imaging; vacuum-assisted excision; B3 lesions; dense breasts; high risk screening.

INTRODUCTION

Breast cancer is the most common malignant neoplasm in women, requiring precise strategies for early detection and optimized management. Preoperative magnetic resonance imaging (MRI) is notable for its high sensitivity, but its routine use is debated due to false positives and high costs[1-8]. B3 lesions, characterized by uncertain malignant potential, pose a clinical challenge, with vacuum-assisted excision (VAE) emerging as a minimally invasive alternative to surgery[9-14]. Dense breasts, present in 40–50% of women, reduce mammography sensitivity and increase cancer risk, necessitating supplemental imaging[15-18]. For high-risk women (>20% lifetime risk), choosing between MRI and contrast-enhanced mammography (CEM) is critical for effective screening[19-25]. The 2025 International Symposium on

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Breast Diseases of Inland São Paulo, held in the city of Campinas, convened experts to define evidence-based guidelines for these four thematic domains, aiming to guide clinical practice in the Brazilian context.

METHODS

The symposium addressed four main topics: (1) indications for preoperative MRI; (2) use of VAE for managing B3 lesions; (3) supplemental imaging for screening dense breasts; and (4) choice between CEM and MRI for high-risk women.

Each topic was presented in a 10-minute lecture based on a literature review, followed by 50 minutes of expert debate. Voting was conducted electronically and anonymously, with participation of 100 professionals—mastologists, radiologists, and oncologists. Consensus was defined as ≥75% agreement. Results were compiled into practical clinical guidelines tailored to the Brazilian public and private healthcare contexts.

RESULTS AND DISCUSSION

1. Indications for preoperative breast magnetic resonance imaging

Introduction to the topic

Preoperative MRI is a highly sensitive tool for assessing tumor extent, particularly in invasive lobular carcinoma (ILC), dense breasts, and occult carcinoma. However, its routine use is questioned due to false positives, unnecessary biopsies, and high costs.

Rationale and evidence

- **Sensitivity and specificity:** MRI has a sensitivity of 90–95% and specificity of 80–85%, but false positives lead to additional biopsies[4,5].
- **Clinical impact:** A meta-analysis by Mota et al., including five randomized controlled trials with 1,856 patients who underwent MRI and 2,014 who did not, showed no significant reduction in reoperations[1]. However, the Magnetic Resonance Imaging in the Preoperative Assessment of Invasive Lobular Carcinoma (MIPA in ILC) study (2022) reported a reduction in reoperations from 12.8% (without MRI) to 1.9% (with MRI)[6]. Ha et al. corroborated lower reoperation rates in ILC[2].
- **Mastectomy:** Lobbes et al. observed reduced primary mastectomies and positive margins in ILC, but increased mastectomy rates in invasive ductal carcinoma[3].
- **Breast density:** Sassi et al. reported higher detection rates of malignant lesions in dense breasts[4]. Onega et al. noted 11% additional biopsies with MRI, more frequent in dense breasts (27.4% vs. 16.2% in Category A of the Breast Imaging Reporting and Data System [Bi-Rads®])[5].
- **Occult carcinoma:** In patients with axillary metastasis and an unidentified primary tumor by mammography or ultrasound (US), MRI is essential for locating the primary focus, guiding therapy, and potentially avoiding radical mastectomies[26].
- **Advantages:** MRI improves staging, detects multifocal/multicentric disease, and aids insurgical/oncoplastic planning[1,7].
- **Limitations:** MRI is associated with false positives (22.6% vs. 5.1% for other methods), additional biopsies, and gadolinium-related risks (e.g., allergy <1%, nephrogenic systemic fibrosis)[1,5].

Voting results

- Never order: 0%
- Selected cases: 100%
- Always order: 0%

Practical recommendations

- **Indications:**
  - Dense breasts (Category C/D)[4].
  - ILC to reduce reoperations[2].
  - High familial risk without recent MRI[1].
  - Suspected extensive disease (multifocal/multicentric)[7].
  - Occult carcinoma with axillary metastasis[26].
  - Surgical/oncoplastic planning[1].
- **Decision:** MRI should be individualized through a multidisciplinary discussion, avoiding routine use due to costs and false positives.

Conclusion

Preoperative MRI is recommended for selected cases but should not be used routinely.

2. Minimally invasive treatment (vacuum-assisted excision) for B3 lesions

Introduction to the topic

B3 lesions, present in 5–10% of breast biopsies, have a malignancy risk of 8–35% (mean 16–20%)[9]. VAE, distinct from vacuum-assisted biopsy (VAB), is a therapeutic procedure that completely removes lesions (<15 mm), reducing the need for surgery[11,13].

Rationale and evidence

- **VAB vs. VAE:** VAB is diagnostic, collecting fragments, while VAE is therapeutic, removing entire lesions (~4 g)[11,13].
- **Efficacy:** VAE avoids surgery in 78.3% of B3 lesions with atypia and 65.1% without atypia[10]. For lesions <15 mm, it achieves complete resection[11].
- **B3 subtypes:** Forester et al. indicated a higher malignancy risk in atypical ductal hyperplasia (ADH) and papillary lesions with atypia[9].
- **Indications and exceptions:**

  - VAE: Recommended for flat epithelial atypia, lobular neoplasia, papillary lesions without atypia, radial scars, and sclerosing lesions[14].
  - Phyllodes tumors: Contraindicated for VAE, except in small (<15 mm), low-proliferative lesions, after multidisciplinary discussion, due to recurrence risk[12,14].
  - Papillary lesions with atypia: Generally require surgical excision, but VAE may be considered after multidisciplinary evaluation[13,14].
  - ADH: Contraindicated in core needle biopsy, but VAE is feasible in VAB for small, unifocal lesions, after multidisciplinary discussion[14].
- **Safety:** Couto reported hematomas in 54% of cases (Grade 1: 29%; Grade 2: 11%; Grade 3: 10%; Grade 4: 4%) and skin lacerations in 13%[12]. McMahon et al. reported 68.5% of surgeries avoided and 66.7% of cancers treated in a single step[11].
- **Guidelines:** The 3rd International Consensus (2023) recommends VAE for B3 lesions in core needle biopsy, except ADH and phyllodes tumors. For VAB, VAE is sufficient with complete resection, followed by radiologic follow-up[14].
- **Limitations:** VAE does not assess margins and is contraindicated for extensive lesions (>15 mm)[13].

Voting results

- Yes: 98%
- No: 2%

Practical recommendations

- **Indications:** For flat epithelial atypia, lobular neoplasia, papillary lesions without atypia, radial scars, and sclerosing lesions (<15 mm)[14].
- **Exceptions:**
  - Phyllodes tumors: VAE only for small, low-proliferative lesions, after multidisciplinary discussion[14].
  - Papillary lesions with atypia: Prefer surgical excision[14].
- **Monitoring:** Annual imaging (mammography, US, MRI) for four years. If malignancy is detected, surgery should be planned[12].
- **Advantages:** Avoids hospitalization, scarring, and is cost-effective[10].
- **Decision:** Multidisciplinary, considering size, histology, and risk.

Conclusion

VAE is effective for managing most B3 lesions, except phyllodes tumors and papillary lesions with atypia, offering a safe, minimally invasive alternative.

3. Supplemental imaging for screening in dense breasts

Introduction to the topic

Dense breasts (Category C/D in Bi-Rads®) reduce mammography sensitivity (62–68%) and increase cancer risk by 4–6 times, necessitating supplemental imaging. In Brazil, only 40% of women undergo screening, with >55% of diagnoses occurring at advanced stages[15].

Rationale and evidence

- **Mammography:** Low sensitivity in dense breasts[16].
- **US:** Sensitivity of 80–83%, detects 2–7 cancers/1,000, but has false positives[17].
- **MRI:** Sensitivity of 90–95%, detects 16–20 cancers/1,000, reduces interval cancers by 84%[18].
- **Cost-effectiveness:** MRI is feasible for high-risk patients, while US is more accessible[15].

Voting results

- Yes, preferably US: 36%
- Yes, preferably MRI: 64%
- No: 0%

Practical recommendations for supplemental imaging in dense breasts:

- **Indications:**
  - MRI: Dense breasts (Category C/D) with high risk (BRCA1/2, Gail risk ≥20%), annual with mammography[18].
  - US: Moderate risk when MRI is unavailable, annual with mammography[17].
- **Strategy:**
  - High risk: MRI is the standard for screening, combined with mammography.
  - Moderate risk: Supplement mammography with MRI or US if MRI is unavailable.
  - Population risk: Discuss case-by-case benefits and drawbacks of supplemental methods (MRI /US) and personalize screening[15].

Conclusion

Supplemental imaging, preferably MRI, is essential for dense breasts, with US as an accessible alternative, especially in resource-limited settings.

4. Preferred imaging for high-risk women: contrast-enhanced mammography or magnetic resonance imaging

Introduction to the topic

High-risk women (>20% lifetime risk) require intensive screening. MRI and CEM are viable options, but the ideal choice depends on sensitivity, specificity, cost, and access.

Rationale and evidence

- **MRI:** Sensitivity of 90–100%, specificity of 80–94%, detects early lesions without radiation[21]. The abbreviated protocol maintains

sensitivity (81.8–100%) and reduces costs[22]. Limitations include cost, false positives, and contraindications[19].

- **CEM:** Sensitivity of 95–95.9%, specificity of 81–81.8%, lower cost (US$196 vs. US$775)[24]. Detects 13.1/1,000 cancers but is less sensitive for early lesions[23].
- **Comparison:** A prospective study (2023) showed MRI (abbreviated protocol and full) superior in sensitivity, but CEM with higher specificity[25].

Voting results

- CEM: 0%
- MRI: 100%

Practical recommendations

- **Indications:**
  - MRI: Preferred for high risk (BRCA1/2, genetic syndromes), annual with mammography, preferably abbreviated protocol[21].
  - CEM: Alternative if MRI is unavailable or contraindicated, for dense breasts or intermediate-high risk[23].
- **Strategy:**
  - High risk: MRI + mammography annually, starting at age 25–30.
  - Intermediate-high risk: MRI + mammography; CEM if MRI is infeasible.

Conclusion

MRI is the preferred imaging for high-risk women, with CEM as a viable alternative in settings with limited access or contraindications.

CONCLUSIONS

The 2025 International Symposium on Breast Diseases of Inland São Paulo guidelines reinforce the following recommendations:

- **Preoperative MRI:** Indicated for selected cases, such as ILC, dense breasts, occult carcinoma, and high risk, but not routinely due to costs and false positives[1-6,26].
- **VAE for B3 lesions:** Effective for managing most B3 lesions, except phyllodes tumors, papillary lesions with atypia, and ADH (except in selected cases), as a minimally invasive alternative[9-14].
- **Dense breasts:** Supplemental imaging, preferably MRI, is essential, with US as an accessible alternative in resource-limited settings[15-18].
- **High risk:** MRI is superior for screening, with CEM as a secondary option in restricted access or contraindicated cases[19-25].

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AUTHORS' CONTRIBUTION

ECP: Conceptualization, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. FB: Investigation, Methodology, Validation, Writing – review & editing. MM: Investigation, Methodology, Writing – review & editing, Validation. JTAN: Data curation, Investigation, Validation, Writing – review & editing. GT: Investigation, Validation, Writing – review & editing. FB: Investigation, Methodology, Validation, Writing – review & editing. BG: Data curation, Investigation, Writing – review & editing. DAB: Methodology, Validation, Writing – review & editing.

BSM: Formal Analysis, Investigation, Validation, Writing – review & editing. HLC: Investigation, Methodology, Validation, Writing – review & editing. BSAF: Data curation, Investigation, Writing – review & editing. GMB: Investigation, Methodology, Validation, Writing – review & editing. ATH: Supervision, Validation, Writing – review & editing.

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