

Results of B3 breast lesions at hospital Alemán (2024–2025): radio pathologic concordance and upgrade rate

Abstract

Introduction: Breast lesions of uncertain malignant potential (B3) include a heterogeneous group of histological entities associated with a variable risk of concurrent or subsequent carcinoma. The term upgrade refers to the identification of ductal carcinoma in situ (DCIS) or invasive carcinoma in the surgical specimen following an initial B3 diagnosis obtained by percutaneous biopsy.

Objective: To evaluate radiopathologic correlation, therapeutic management, and upgrade rate in B3 lesions diagnosed at our institution.

Materials and Methods: A single-center retrospective observational study was conducted. All breast biopsies performed between July 2024 and August 2025 with a histological diagnosis of B3 lesion obtained by core needle biopsy or vacuum-assisted biopsy (VAB) were included. Clinical, imaging, histological variables, therapeutic management, and final pathological outcomes were analyzed.

Results: A total of 759 breast biopsies were analyzed, identifying 42 B3 lesions (5.53%). The predominant imaging finding was microcalcifications (73.8%). Diagnosis was made by VAB in 76.2% of cases. The most frequent lesion was flat epithelial atypia (52.3%). Surgical treatment was performed in 59.5% of patients. The overall upgrade rate was 16.7%, with half of the upgraded cases corresponding to DCIS.

Conclusion: The frequency of B3 lesions and the observed upgrade rate are consistent with the literature. Radiopathologic correlation and appropriate patient selection allow for individualized management, reducing unnecessary surgeries without compromising oncologic safety.

Keywords: breast lesions, ductal carcinoma in situ, vacuum-assisted biopsy, flat epithelial atypia, malignancy

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Abbreviations: B3, breast lesions of uncertain malignant potential; DCIS, ductal carcinoma in situ; VAB, vacuum-assisted biopsy; ADH, atypical ductal hyperplasia; FEA, flat epithelial atypia

Introduction

Breast lesions classified as category B3, or lesions of uncertain malignant potential, represent a histologically heterogeneous group that includes entities such as atypical ductal hyperplasia (ADH), flat epithelial atypia (FEA), papillary lesions with or without atypia, radial scars or complex sclerosing lesions, and classic lobular neoplasia. Although these lesions do not meet criteria for malignancy, they are associated with a variable risk of coexisting or progressing to ductal carcinoma in situ (DCIS) or invasive carcinoma.¹⁻³

These lesions are typically diagnosed through image-guided percutaneous biopsy, either by core needle biopsy or vacuum-assisted biopsy (VAB). However, the sampled tissue may not fully represent the entire lesion, which explains the possibility of diagnostic underestimation.^{4,5}

In this context, the concept of upgrade refers to the identification of carcinoma in the surgical specimen following an initial B3 diagnosis. Reported upgrade rates in the international literature vary widely, ranging from 10% to 35%, depending on histological subtype, biopsy technique, and radiopathologic concordance.^{6,7}

Historically, most of these lesions were managed surgically. In recent years, however, management has evolved toward a more individualized approach. Current European guidelines recommend integrating clinical, radiological, and histological factors to guide management decisions, promoting less invasive strategies in selected cases with adequate radiopathologic concordance.³

Objective

The aim of this study was to assess radiopathologic correlation in B3 lesions at our institution, evaluate the therapeutic approach adopted, and analyze the rate of diagnostic underestimation in surgically treated cases.

Materials and methods

A single-center retrospective observational study was conducted at Hospital Alemán (Buenos Aires, Argentina). All breast interventional procedures performed by the Breast Imaging Department between July 2024 and August 2025 were reviewed.

Patients with a histological diagnosis of B3 lesion obtained through percutaneous breast biopsy, either by core needle biopsy or vacuum-assisted biopsy (VAB), were included.

The following variables were analyzed: imaging findings, biopsy method, histological subtype, therapeutic management, and final pathological results in surgically treated cases.

Results

During the study period, 759 breast biopsies were performed, of which 42 corresponded to B3 lesions, representing 5.53% of the total. The mean age was 48.6 years.

The most frequent imaging finding prompting biopsy was microcalcifications (73.8%; $n = 31$), followed by nodules and asymmetries.

Regarding diagnostic method, 76.2% ($n = 32$) of cases were diagnosed by vacuum-assisted biopsy (VAB), while 23.8% ($n = 10$) were diagnosed by core needle biopsy.

The most prevalent lesion was flat epithelial atypia, accounting for 52.3% ($n = 22$) of cases, followed by papillary lesions, atypical ductal hyperplasia, and radial scars in smaller proportions.

Overall, 59.5% of patients underwent surgical treatment, while the remaining 40.5% were managed with imaging follow-up based on radiopathologic concordance and individual risk profile.

Histopathological analysis of surgical specimens showed an overall upgrade rate of 16.7%. Half of the upgraded cases corresponded to ductal carcinoma in situ, with no invasive carcinoma identified in the remaining cases.

Discussion

In our series, B3 lesions accounted for 5.53% of all breast biopsies, consistent with international reports where incidence ranges from 3% to 21%.^{3,7} Similar findings have been reported in local series such as Flemming, supporting the validity of our results.⁸

The predominance of microcalcifications as the initial imaging finding aligns with multiple studies and explains the frequent use of vacuum-assisted biopsy. VAB allows for larger tissue samples and improves lesion representativeness, potentially reducing diagnostic underestimation.⁹

The high prevalence of flat epithelial atypia observed in our series (over 50%) may be related to its typical radiological presentation as amorphous and clustered microcalcifications. Additionally, when FEA is not associated with other lesions, its upgrade risk is approximately 5%, compared to 16% when associated with other lesions.^{10,11} This supports the need for individualized evaluation and multidisciplinary management to identify patients who may benefit from conservative approaches.

The overall upgrade rate of 16.7% falls within the range reported in the literature (approximately 10–30%).^{5,6} This finding highlights the importance of careful patient selection to avoid both underestimation and overtreatment.

Management of B3 lesions has evolved toward a personalized approach based on clinical, radiological, and histological factors.^{12–14} Radiopathologic correlation plays a central role in decision-making. In our series, a significant proportion of patients were managed conservatively without short-term progression, suggesting that this strategy may be safe in selected cases.

Study limitations include its retrospective design, sample size, and lack of long-term follow-up for non-operated patients. However, strengths include consistent diagnostic criteria and multidisciplinary case evaluation.^{15–19}

Conclusion

B3 lesions represent a significant proportion of breast biopsies and pose both diagnostic and therapeutic challenges. The proportion of B3 lesions and the upgrade rate observed in our institution are consistent with national and international reports.

Radiopathologic correlation and a multidisciplinary approach are essential to individualize management, allowing avoidance of unnecessary surgery in selected patients without compromising oncologic safety.

Management should move toward personalized strategies in line with current recommendations, integrating lesion characteristics, diagnostic methods, and patient preferences.

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Conflicts of interest

The authors declare no potential conflicts of interest.

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