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Assessing and managing benign breast lesions leading to mastalgia: A review of 840 patients

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ABSTRACT

Objective: Mastalgia often raises malignancy concerns. This study explores its link to benign breast conditions, and cancer.

Material and Methods: This retrospective study included 840 patients presenting to the surgical clinic with breast disease between January 2016 and January 2023.

Results: This study included 840 patients (800 female, 40 male) presenting with mastalgia, either as an isolated symptom or in combination with other complaints. In 350 cases (41.6%), pain alone was reported; in 410 cases (48.8%), pain with a lump; and in 18 cases (2.1%), pain with nipple discharge. Non-cyclic pain (51.5%) was more common than cyclic pain (42.5%), with pain most frequently localized to the right breast (53.5%), followed by bilateral (23.8%) and left breast (17.8%) pain ($p<0.001$). A significant association was observed between mastalgia and neck/shoulder pain (10.7%, $p<0.001$). A family history of breast cancer was present in 16.6% of patients. Histologic analysis revealed fibrocystic changes (42.2%), fibroadenoma (21.1%), and ductal ectasia (11%) as the most common diagnoses. Malignancy was detected in 6 cases (1.3%, including 1 male patient), with a significantly higher prevalence in the pain + lump group ($p<0.001$). Other findings included mastitis (9 cases), abscess (53 cases), and fat necrosis (4 cases). Patients with suspected malignancy underwent biopsy based on radiologic suspicion (BIRADS 2-4a) and physical examination.

Conclusion: Mastalgia is predominantly a benign condition, but non-cyclic pain, particularly when associated with a lump, warrants thorough evaluation to exclude malignancy. The link between mastalgia and fibrocystic changes shows that research is needed into the causes and consequences. It is not a malignancy indicator, accurate diagnosis requires histological and radiological assessments.

Keywords: Breast pain, malignancy risk, fibrocystic changes, atypical mastalgia

INTRODUCTION

Mastalgia is a prevalent symptom experienced by most women at some point in their lives, often resolving on its own. A thorough history, physical examination, and specific imaging can help pinpoint the underlying cause of mastalgia, aiding in the selection of suitable treatment options. Various factors have been recognized as potential contributors to the physiological causes of mastalgia, including hormonal changes, dietary habits, stress, medications, and poorly fitting bras. While breast cancer is a rare reason for breast pain, it should still be considered and investigated as a potential diagnosis. Various therapeutic methods exist to alleviate breast pain, such as providing reassurance, implementing supportive measures, adjusting diet, administering non-steroidal anti-inflammatory drugs, and hormonal interventions. Pain may range from mild to severe, may come and go, and may last all day, affecting quality of life (1,2). Mastalgia can be associated with premenstrual syndrome, fibrocystic disease and, in rare cases, breast cancer. Moreover, studies have shown that breast pain is not associated with an increased risk of cancer (3). The aim of this study was to characterize and manage benign breast conditions causing mastalgia and to examine the relationship between mastalgia and malignancy.

MATERIAL and METHODS

Study Design and Setting

This retrospective observational study included 840 patients who presented with mastalgia (breast pain) between January 2016 and December 2022. The study was

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conducted in the only tertiary care hospital in a city located in the western part of the Black Sea Region, Türkiye. Due to the absence of alternative secondary or tertiary centers, this hospital serves as the primary referral facility for patients with breast complaints in the region. This centralized healthcare model allowed for the comprehensive collection of clinical data from a well-defined population.

Data Collection Process

Data were retrieved from the hospital's electronic medical record (EMR) system, which archives patient demographics, clinical notes, radiological images, and reports, operative records, pathology results, and laboratory tests. A trained research team accessed and reviewed the data in a structured format using standardised data abstraction forms to ensure consistency. Data validation techniques included cross-referencing imaging findings with pathology results and independently verifying diagnostic codes related to breast disease. Missing or ambiguous records were reviewed by a second investigator to improve accuracy and reliability.

The EMR system utilized in this hospital is integrated with diagnostic imaging and pathology databases, enabling researchers to follow the patient journey from presentation to diagnosis and management. Only complete and verifiable patient records were included in the analysis.

Inclusion and Exclusion Criteria

Patients were included if they presented to the surgical outpatient department specifically with mastalgia during the study period. Patients whose primary complaint was not breast pain (e.g., palpable mass without pain, nipple discharge, or systemic symptoms) were excluded from the study to maintain a focused dataset relevant to mastalgia-related breast lesions.

Histopathological Evaluation

Breast tissue samples were obtained for histopathological assessment via core needle biopsy, excision biopsy, incision biopsy, or simple mastectomy, depending on the clinical and radiological findings. The choice of biopsy method was guided by lesion characteristics and anatomical accessibility.

- Core needle biopsy was preferred for both palpable and non-palpable lesions with suspicious imaging findings, particularly breast imaging-reporting and data system (BI-RADS) category 4 and 5.
- Excision biopsy was used in cases where core biopsy was unsuitable, such as in lesions with ambiguous borders, difficult locations, or inadequate sample yield.
- Mastectomy specimens were evaluated in patients who underwent surgical treatment for persistent or complex lesions.

Histopathological classification was performed by experienced pathologists according to the World Health Organization classification of breast tumors, distinguishing between benign, atypical, and malignant lesions.

Diagnostic and Imaging Approach

A stepwise diagnostic algorithm was employed for evaluating breast pain:

1. Ultrasound was used as the first-line imaging modality for all patients.
2. The BI-RADS classification was applied to standardize reporting and inform next steps.
3. Mammography was used for patients over 40 years of age, or those with suspicious findings on ultrasound.
4. Breast magnetic resonance imaging (MRI) was reserved for inconclusive cases or for further characterization of complex lesions.
5. Hormonal profile assessments (including estrogen and prolactin levels) were conducted selectively, particularly in premenopausal women or patients with cyclic pain.

No specific pre-intervention medications or procedures were applied. The diagnostic and management process followed national clinical guidelines and evidence-based practice, ensuring a standardized approach across all cases.

Ethical Approval

All procedures followed ethical standards and the principles outlined in the Declaration of Helsinki. The study commenced after obtaining approval from the Bartın University Medical Faculty Clinical Research Ethics Committee (ethical no: 2023-SBB-0914). Patients' demographic and clinical characteristics were evaluated. Given the retrospective nature of the study, the need for written informed consent from the patients was waived.

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, NY, USA). Continuous variables were assessed for normality using the Shapiro-Wilk test. Data with normal distribution are expressed as mean ± standard deviation, whereas non-normally distributed data are presented as median (interquartile range).

To compare continuous variables between two independent groups, the independent samples t-test was used for normally distributed data, and the Mann-Whitney U test was applied for non-normally distributed data. Categorical variables were summarized as frequencies and percentages (%) and compared using the chi-square (χ^2) test. When expected cell counts were <5, Fisher's exact test was applied.

A p-value <0.05 was considered statistically significant for all analyses.

To enhance interpretability and data transparency:

• Key results were presented in tables, including descriptive statistics, p-values, and effect sizes where applicable.

All analyses were independently reviewed by a biostatistician to ensure methodological rigor and compliance with good statistical practice in clinical research.

RESULTS

Demographic and clinical data for these 840 patients can be found in Tables 1-3.

During the study period, a total of 840 patients presented to the breast clinic. Out of these, 350 patients reported breast pain either as their sole symptom or in combination with other symptoms. The ages of the patients ranged from 15 to 65 years, with a mean age of 32.5 years.

The presenting complaints were categorized as follows:

• Pain alone in 350 patients (41.6%)

• Pain with a lump in 410 patients (48.8%)

• Pain with nipple discharge in 18 patients (2.1%)

The pain was identified as non-cyclical in 412 patients (51.5%). The distribution of pain by the affected breast was:

• Right breast in 450 patients (53.5%)

Table 1. Patient characteristics

Main category	Subcategories	Frequency	Percentage
Age; m (SD) Range: 15-65			
Menstrual status	Menstruating	520	65
Menstrual cycles	Menopausal	280	35
	Regular	460	57.5
Lactation status	Lactating	170	21.25
	Non-lactating	180	22.5
Nipple discharge	History of lactation	580	72.5
	Yes	110	13.75
	No	620	77.5
Family history of breast cancer (female, male)	Positive family history of breast cancer	140	16.6
	Negative family history of breast cancer	700	83.3

SD: Standard deviation

Table 2. Pain analysis

Main category	Subcategories	Frequency	Percentage	z-value/chi-square value	p-value
Type of pain	Cyclical	340	42.5	-2.477*	0.013
	Non-cyclical	412	51.5		
Site of pain (female, male)	Right breast	450	53.5	67.627**	<0.001
	Left breast	150	17.8		
	Bilateral	200	23.8		
Pain in other sites (neck and shoulder) (female,male)	Yes	90	10.7	-12.457*	<0.001
	No	640	76.1		

*: z-value, **: chi-square value

According to the results of the analysis in Table 2, in terms of the type of pain, non-cyclic pain (51.5%) was more common than cyclic pain (42.5%) and this difference was statistically significant (z=-2.477, p=0.013).

In terms of localisation of pain, pain was most commonly reported in the right breast (53.5%) and less frequently in the left breast (17.8%). In addition, the rate of bilateral breast pain was found to be 23.8%. The difference observed in the analysis of localisation was statistically significant (χ^2=67.627, p<0.001).

In addition, while the rate of those who reported pain in other regions such as neck and shoulder was 10.7%, the rate of those who did not report pain was 76.1%. This difference was statistically significant (z=-12.457, p<0.001).

These findings indicate that non-cyclic breast pain is more common, that pain is most commonly seen in the right breast, and that the relationship with pain in the neck-shoulder region is significant

• Left breast in 450 patients (53.5%)

• Both breasts in 200 patients (23.8%)

Non-cyclic breast pain is more common than cyclic pain, with the right breast being the most commonly affected. There is a significant association between breast pain and pain in the neck and shoulder region (p<0.001).

This study highlights the frequency and distribution of breast pain among patients presenting to the clinic and provides insights into the nature of their symptoms.

According to the BI-RADS classification, the distribution of mass lesions among the patients was as follows:

- 46.5% of patients had BI-RADS 1 mass lesions
- 40.2% had BI-RADS 2 mass lesions
- 8.4% had BI-RADS 3 mass lesions
- 2.5% had BI-RADS 4 and 5 mass lesions (Figure 1).

Patients with BI-RADS 5 mass lesions reported non-cyclical and severe pain, typically in the post-menopausal period. These patients also had palpable masses along with persistent pain. The mammography and ultrasonography findings were assessed using the BI-RADS classification system, as described by the Radiological Society of North America.

The histological diagnoses (Table 4) among the patients were as follows:

- Fibrocystic changes: 190 cases (43.1%)
- Fibroadenoma: 95 cases (21.5%)
- Ductal ectasia: 50 cases (11.3%)

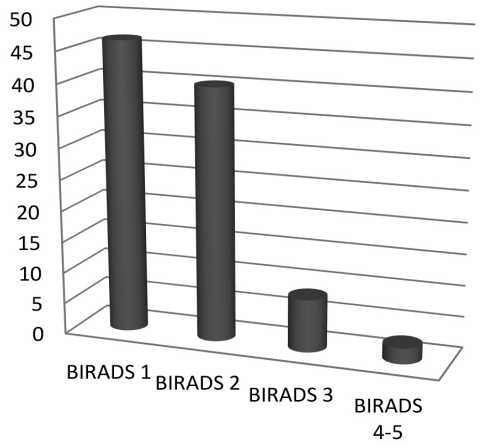

Figure 1. Percentage distribution of patients based on BIRADS classification.

BIRADS: Biopsy based on radiologic suspicion

Table 3. Primary symptom evaluation of benign breast changes

Symptom	Breast changes	Percantage of total patients
Pain	**Cysts** **-Fibrocystic breast disease** **- Hyperplasia of the breast** **- Mastitis** **- Postoperative changes**	88.8%
Palpable mass	Cysts - Fibrocystic breast disease - Fibroadenoma - Lipoma - Hamartoma - Intramammary lymph nodes	48%

Table 4. Histological diagnosis of breast pain

Main category	Frequency	Percantage	Chi-square test value	p-value
Fibrocystic changes	190	42.22	471.316	<0.001
Fibroadenoma	95	21.11		
Ductal ectasia	50	11.11		
Hamartoma	12	2.67		
Mastittis, abscess (M&F)	53	11.78		
Fat necrosis	11	2.44		
Carcinoma (both female and male)	6	1.33		
Non	33	7.33		

According to Table 5, it was examined whether there was a difference in breast pain rates between the groups. Accordingly, the difference in breast pain rates between groups is significant (p<0.001). The group with the highest breast pain is the fibrocystic changes group

Table 5. The patients clinically diagnosed with breast cancer, the presenting complaints

Patient group	Total number of patients	Malignancy rate (%)
Pain only	350	22.3%
Pain + lump	350	68.5%
Pain + nipple discharge	350	14.7%

- Hamartoma: 12 cases (2.7%)
- Mastitis/abscess: 53 cases (11.7%)
- Fat necrosis: 11 cases (2.4%)
- Carcinoma: 6 cases (1.39%)
- No specific diagnosis: 33 cases (7.3%).

Among patients clinically diagnosed with breast cancer, the presenting complaints were:

- Pain only: 22.3%
- Pain with nipple discharge: 14.7%
- Pain with a lump: 68.5% (Table 5).

According to Table 5, a difference in breast pain rates between the groups was examined. Accordingly, the difference in breast pain rates between groups is significant ($p<0.001$). The group with the highest breast pain is the fibrocystic changes group.

The difference in malignancy rate between groups was examined with the chi-square test. According to the results, the malignancy rate of the pain + lump group was higher than the other two groups ($p<0.001$).

Moreover, 70% of patients histologically diagnosed with cancer reported experiencing both pain and a palpable lump. Nearly all patients diagnosed with cancer, either clinically or histologically, exhibited a palpable breast lump during clinical breast examination. Mastalgia alone is not significantly associated with malignancy, but its presence alongside a mass increases the malignancy risk.

Patient Follow-up and Clinical Implications

Patients with BI-RADS 3 or higher, non-cyclical pain, and palpable masses were subjected to follow-up for 6 to 12 months, encompassing scheduled imaging procedures and clinical examinations. Those with histopathologically confirmed benign lesions received tailored follow-up based on risk profile, symptom persistence, and radiological findings.

For high-risk groups, including postmenopausal women with unilateral, persistent, non-cyclical mastalgia and BI-RADS 3-5 lesions, closer monitoring and early tissue diagnosis are recommended. The importance of integrating routine ultrasound and timely biopsy for unresolved symptoms cannot be overstated when it comes to avoiding delayed malignancy diagnosis.

DISCUSSION

Common Causes of Mastalgia

Mastalgia, characterized by pain in the nipple and breast tissue, is a common complaint among women, with approximately 70% experiencing it at some point in their lives. Although often self-limiting, it can significantly impact quality of life due to concerns about malignancy. However, breast pain alone is rarely indicative of breast cancer (4). A study by Khan and Apkarian (5) detected malignancy in only 0.63% of 5.463 patients with mastalgia, whereas our study found a slightly higher rate of 1.3%. This difference may be due to the smaller range of our study population. A 2018 meta-analysis (6) also found no significant association between mastalgia and malignancy, a finding supported by our results.

Mastalgia is broadly classified into cyclical and non-cyclical types. Cyclical mastalgia, linked to hormonal fluctuations, is more common in younger women and typically presents as bilateral, intermittent pain. Non-cyclical mastalgia, often unilateral and persistent, is more prevalent in postmenopausal women and may occasionally be associated with underlying pathology, including malignancy (7,8). Our study found that non-cyclic breast pain was more common than cyclic pain, with the right breast being the most frequently affected. Additionally, a significant association was observed between breast pain and pain in the neck and shoulder region ($p<0.001$). Preece et al. (9) noted that breast cancer-related pain often exhibits a cyclical pattern. However, our findings suggest that non-cyclic mastalgia in postmenopausal women may have a significant association with malignancy, which requires careful evaluation. This difference may be due, for example, to study populations or methodologies. Several recent studies, including a 2024 systematic review by Tomar et al. (10), have emphasized the diagnostic challenge of distinguishing benign mastalgia from early breast malignancy, especially in postmenopausal women, supporting our findings on the need for careful evaluation in high-risk groups. There is ongoing debate about whether mastalgia is purely psychoneurotic in origin. However, most cases have physiological or pathological causes rather than psychological ones (11). A significant association was found between mastalgia and fibrocystic changes, non-lactating history, and a family history of breast cancer, while no direct association was identified with other factors studied (Tables 1-3). The estimated probability of developing breast cancer in patients presenting with mastalgia alone ranges between 0.8% and 2.7% (12). Although mastalgia may occur in advanced breast cancer, primary evaluation should focus on ruling out malignancy through appropriate diagnostic tools to reduce patient anxiety.

Among benign breast conditions, fibrocystic changes and hyperplasia were most common, particularly in patients over 35 years of age. Palpable masses were identified in 48% of patients (Table 3). No significant association was found between breast pain and nipple discharge (13). However, 11.25% of patients had pain originating from musculoskeletal sources, which responded well to analgesics and local steroid injections. Recognizing musculoskeletal pain is essential for distinguishing it from mastalgia and ensuring appropriate management (14). Our study identified a significant association between mastalgia and fibrocystic changes, a novel finding not clearly reported in previous studies. The observed association between fibrocystic changes and mastalgia is corroborated by the large-scale study (15), which additionally found a significant correlation between dense breast tissue and non-cyclical pain. Emphasizing the low risk of malignancy in patients with mastalgia may help reduce unnecessary anxiety and enable clinicians to adopt a more targeted approach.

Diagnostic Evaluation and Imaging Findings

All patients underwent a thorough clinical examination, with routine mammography for those over 40, and an ultrasound for nearly all patients. Additional imaging, including MRI (16), was performed when initial findings were inconclusive. The mean age of patients was under 40 years, consistent with existing literature, and the mean duration of painful symptoms was five days per month. This comprehensive imaging approach provided a more detailed assessment than previous studies (16), supporting the notion that routine further imaging in patients with mastalgia may be unnecessary. This finding suggests that clinicians can optimize resource utilization. A 2020 cohort study by Holbrook (17) demonstrated that over 62% of patients with non-cyclical mastalgia had benign imaging findings, echoing our conclusion that breast pain alone often does not indicate malignancy.

According to the BI-RADS classification, 46.5% of masses were BI-RADS 1, 40.2% BI-RADS 2, 8.4% BI-RADS 3, and 2.5% BI-RADS 5 (Table 4). Patients with BI-RADS 5 masses reported persistent non-cyclic postmenopausal pain associated with palpable masses. Histological analysis (Table 5) revealed fibrocystic changes (43.1%), fibroadenoma (21.5%), ductal ectasia (11.3%), hamartoma (2.7%), mastitis/abscess (11.7%), adiposis (2.4%), cancer (1.3%), and non-specific findings (7.3%). Among clinically diagnosed breast cancer patients, 22.3% presented with pain alone, 14.7% with pain and nipple discharge, and 68.5% with pain and a lump (Table 5). Almost all cancer cases had a palpable mass on clinical examination, with histopathological findings predominantly consistent with invasive ductal carcinoma. Our results align with recent data from the UK Breast Screening Programme, which reported that mastalgia, in the absence of a mass or radiological abnormality, has a cancer detection rate of less than 1% (18). Yıldırım et al. (19) found no significant correlation between BI-RADS categories and type of mastalgia, suggesting that breast pain alone, without radiological or physical findings, does not increase cancer risk, which is consistent with our study.

Implications for Malignancy Risk

Although mastalgia is rarely a direct indicator of breast cancer, it can sometimes be the first symptom of non-cyclic pain, particularly in postmenopausal women. In our study, 20 patients initially presenting with mastalgia were diagnosed with early-stage breast cancer. This finding underscores the importance of a comprehensive assessment despite the low overall risk of malignancy. While Preece et al. (9) suggested that breast cancer-related pain is typically cyclical, our study found a stronger association between non-syndromic mastalgia and malignancy in postmenopausal women. This discrepancy may be due to the broader age range of our study population.

The literature (20) indicates that approximately two-thirds of mastalgia cases are cyclic and related to hormonal fluctuations (21), whereas non-cyclic mastalgia is more common in women over 40 years and is usually unilateral (21). Studies (22) suggest that breast cancer-related pain is typically unilateral and persistent, in contrast to cyclic mastalgia (23). Our study reinforces that postmenopausal women with non-cyclic mastalgia may have a higher risk of malignancy, highlighting the need for further focused research on this subgroup.

In a study (24) women found no link between breast pain and cancer, and most patients were not diagnosed with malignancy. However, some postmenopausal women with non-cyclic mastalgia may develop breast cancer. Consistent with the existing literature, non-cyclic mastalgia is more common in postmenopausal women, whereas cyclic mastalgia is more common in younger patients. As the classification is based on patient history, there is a potential bias (25). Further research is needed to assess cancer risk and to better understand the subtypes and causes of mastalgia. Kızılkaya et al. (8) suggested that premenopausal patients with non-cyclic breast pain might have malignancy. Some studies (26,27) have linked mastalgia with obesity, nulliparity, smoking, and high caffeine consumption, but our study found no association between pain intensity and malignancy risk. This supports the notion that pain alone is not a definitive indicator of malignancy.

There's been much debate in the literature about the connection between non-cyclic mastalgia and breast cancer, with some studies pointing towards a link, but the overall risk is considered low. For example, a study in the American Journal of Roentgenology (28) found breast cancer incidence in patients with breast pain as their only symptom to be between 0% and 2.3%. Similarly, research in the American Family Physician (29) journal stated that after normal clinical breast examination and

mammography, the risk of malignancy in patients with non-cyclic breast pain is about 0.5%.

The discrepancies in findings may be attributed to differences in study populations, diagnostic criteria, and methodologies. Some high-risk studies or specialist breast clinic patients may overestimate cancer risk. The lack of definitions or imaging differences further complicates comparison. Our study found no significant difference in malignancy rates between cyclic and non-cyclic mastalgia. Clinical/radiology evaluation remains essential for diagnosis, not just pain patterns.

Treatment options for mastalgia include tamoxifen, danazol, gamma-linolenic acid, and Fructus Agni Casti (30). However, these treatment modalities remain controversial (31). In our clinic, consistent with the literature, pharmacological intervention is generally avoided. Mastalgia often resolves spontaneously, though persistent cases may benefit from NSAIDs such as diclofenac or paracetamol (32). Hormone therapy is reserved for select cases due to its potential side effects.

Clinical Implications and Follow-up

Our findings suggest that a stepwise, symptom-based approach to mastalgia management is both effective and resource-efficient. In cases of mastalgia without other clinical or radiological abnormalities, reassurance and short-term follow-up may be sufficient. For patients with risk factors such as age over 40, non-cyclical pain, or a palpable mass, a more aggressive diagnostic approach, including biopsy, is warranted.

We propose a follow-up protocol based on mastalgia type, age, and physical findings:

- Low-risk (cyclical, <40 years, no lump): Observation and symptomatic treatment.
- Moderate-risk (non-cyclical, <40 years, family history): Imaging and 3-6 month follow-up.
- High-risk (non-cyclical, >40 years, lump or BI-RADS 3-5): Immediate biopsy and specialist referral.

Such stratification can be instrumental in reducing patient anxiety and improving diagnostic accuracy. This stepwise approach is further supported by Siddique et al. (33), who highlighted the value of structured risk models in mastalgia evaluation to minimize unnecessary intervention while ensuring early detection.

Suggestions for Future Research

This study contributes to the growing body of literature supporting the low likelihood of malignancy in mastalgia, particularly when it occurs in isolation.

Further research needs to be done:

- Long-term outcomes of patients with mastalgia and BI-RADS 3 lesions can be investigated.
- The role of hormonal and lifestyle factors in chronic mastalgia can be assessed.
- Predictive models or scoring systems can be developed to identify patients at higher risk of malignancy.
- Investigating the psychosocial impact of mastalgia and management strategies can provide insights into quality of life, where the presence of clinical symptoms may be an early sign of malignancy.

Our study provides valuable insights into the low malignancy risk associated with mastalgia and emphasizes the importance of a comprehensive evaluation to rule out underlying pathology. While mastalgia is predominantly physiological, persistent or atypical cases -particularly in postmenopausal women- warrant further investigation. Imaging modalities such as ultrasound and mammography remain crucial for identifying underlying pathological causes, while histological analysis remains the gold standard for definitive diagnosis.

The relationship between mastalgia and obesity, smoking, and caffeine consumption is underexplored in the literature. Future research could focus on analyzing these factors in detail.

This study demonstrates that although mastalgia is often associated with benign conditions such as fibrocystic changes, it can also be linked to other medical issues. The findings emphasise the importance of a structured diagnostic approach, including clinical assessment, imaging and histopathology for effective patient management.

Recommendations for Practice

- Clinicians should maintain a high index of suspicion for malignancy in patients with persistent mastalgia and concurrent breast masses.
- A graded follow-up algorithm should be applied, especially for BI-RADS 3+ lesions and non-cyclical pain, in older age groups.
- Developing a risk stratification tool for mastalgia cases based on imaging and clinical features may aid resource allocation and reduce unnecessary anxiety in low-risk patients.

The risk-based approach proposed in this study is consistent with current clinical practice guidelines, including those issued by the American College of Obstetricians and Gynecologists and the National Institute for Health and Care Excellence, which emphasise individualised assessment and stratification based on clinical and imaging findings. By means of patient categorization according to risk profiles, clinicians can more accurately determine the necessity for further investigation or intervention, thereby minimizing unnecessary imaging in low-risk cases while ensuring early diagnosis in high-risk presentations. This strategy has the potential to enhance the utilisation of resources and to provide reassurance to patients, particularly in settings where access to advanced diagnostic tools is limited.

Study Limitations

This study has several inherent limitations due to its design: Data were collected from patient records, which may have contained inaccuracies, and the study also lacked long-term follow-up due to the absence of standardisation. Additionally, as the study was conducted across a single centre, the findings may not be generalisable. Finally, the study did not assess key contributing factors.

CONCLUSION

In conclusion, while mastalgia is predominantly a benign and self-limiting condition, a comprehensive evaluation is essential to rule out malignancy and other underlying causes, particularly in high-risk subgroups. Emphasizing the low malignancy risk and adopting a tailored diagnostic approach can optimize patient care and resource utilization.

Ethics

Ethics Committee Approval: All procedures followed ethical standards and the principles outlined in the Declaration of Helsinki. The study commenced after obtaining approval from the Bartın University Medical Faculty Clinical Research Ethics Committee (ethical no: 2023-SBB-0914).

Informed Consent: Due to the retrospective nature of this study, written informed consent was not obtained.

Footnotes

Author Contributions

Concept - Y.D., A.M.D.; Design - Y.D., A.M.D., M.Ç., S.S.Ç.; Supervision - E.C.D., Y.D., M.Ç., S.S.Ç.; Materials - Y.D., A.M.D., M.Ç., S.S.Ç.; Data Collection or Processing - E.C.D., M.Ç., S.S.Ç.; Analysis or Interpretation - Y.D., E.C.D., A.M.D.; Literature Search - Y.D., A.M.D., M.Ç., S.S.Ç.; Writing - Y.D., E.C.D., M.Ç.

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