Open Access

Original Article

Histological Outcome of Needle Core Biopsies in Breast Lesions and Advantage of Using Reporting Categories of Royal College of Pathologists, London (UK)

Tariq Sarfraz, Saba Aneeqa, Humaira Tariq*, Yasmin Wahid, Rehana Ramzan, Tania Khattak, Salma Afzal, Rubina Riaz

Department of Pathology, Foundation University Medical College, Islamabad Pakistan, *Department of Obs & Gynae, Combined Military Hospital/ National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objective: To determine the frequency of various categories of lesions in needle core biopsies done in breast lumps and the utility of using the reporting categories (B1 – B5) of the Royal College of Pathologists London (United Kingdom).

Study Design: Cross-sectional study.

Place and Duration of Study: Department of Histopathology, Foundation University Medical College, Islamabad Pakistan, from Jan to Dec 2021.

Methodology: The study included one hundred cases of needle core biopsies done on breast lumps. After processing the tissue, the slides were made and stained with Hematoxylin and Eosin. Microscopic evaluation was done by the consultant Histopathologist. The frequency of various breast lesions was analyzed, and they were categorized into different 'B' categories according to Royal College of Pathologists guidelines.

Results: The lesions included in B1 category (Normal tissue) comprised five cases (5%), B2 category (Benign) twenty cases (20%), B3 category (Uncertain malignant potential) twelve cases (12%), B4 category (Suspicious for malignancy) three cases (3%) and B5 category (Malignant) sixty cases (60%).

Conclusion: Reporting of needle core biopsies, according to the reporting categories of the Royal College of Pathologists, London (B1–B5), gives a precise diagnosis of most lesions and provides the clinician with a clear road map for further management. B5 Category (Malignant) lesions are needle core biopsies' most common histological outcomes.

Keywords: Benign, Breast lump, Malignant, Needle core biopsy, Reporting categories.

How to Cite This Article: *Sarfraz T, Aneeqa S, Tariq H, Wahid Y, Ramzan R, Khattak T, Afzal S, Riaz R. Histological Outcome of Needle Core Biopsies in Breast Lesions and Advantage of Using Reporting Categories of Royal College of Pathologists, London (UK). Pak Armed Forces Med J 2023; 73(4): 1186-1189. DOI: https://doi.org/10.51253/pafmj.v73i4.9233*

INTRODUCTION

Breast cancer is the most common cancer in women, according to the latest data from World Health Organization (WHO).[1] According to international statistics, in the United Kingdom (UK), one out of every seven women gets breast cancer, whereas, in Germany and the United States of America, one out of every eight women has breast cancer at some stage of her life.[2] In Pakistan, no such statistical data is available; however, the incidence of breast cancer is on the rise.[3] For the diagnosis of breast cancer radiologically and to determine the effective management of the patient suffering from this disease, there is a standardized reporting system of breast cancer lesions called Breast Imaging Reporting and Data System (BI-RADS).[4] This system is a comprehensive guide for quality assurance and better interpretation of breast imaging reporting developed by the American College of Radiologists.[5,6]

The definitive diagnosis is carried out by triple assessment, considered a standard practice today. It encompasses physical examination, imaging modalities including mammogram and ultrasound, and biopsy techniques including Fine Needle Aspiration Cytology (FNAC) and Needle Core Biopsy (NCB).[7]

NCB is considered a less invasive and cost-effective diagnostic technique providing intact tissue fragments for histopathological examination and doing receptor studies.[8] It serves as a gold standard screening tool.[9] All the NCB histopathology reports are assigned reporting categories from B1–B5 per reporting guidelines and datasets of the Royal College of Pathologists (RCPath), London, United Kingdom (UK). Most of the time, it is possible to give a confident and definitive diagnosis and assign a reporting category on NCB, like normal tissue (B1), benign (B2), uncertain malignant potential (B3), suspicious for malignancy (B4) and malignant (B5).[10]

The rationale objective of this study was to determine the utility of using reporting categories (B1–B5) of the Royal College of Pathologists, London (UK) and to assess the frequency of various categories of lesions in needle core biopsies done in breast lumps, reported

Correspondence: Dr Tariq Sarfraz, Department of Pathology, FUMC, FUI Pakistan

Received: 01 Sep 2022; revision received: 12 Apr 2023; accepted: 17 Apr 2023

according to categories of Royal College of Pathologists London (United Kingdom).

METHODOLOGY

The cross-sectional study was conducted at the Department of Pathology (Histopathology) at Foundation University Medical College (FUMC), Islamabad Pakistan, from January to December 2021, after approval from the Ethical Research Committee of Fauji Foundation Hospital (Ltr no. 602/RC/FFH/RWP Dated 29 Aug 2022). The sample size was calculated by using the online calculator Raosoft, taking population proportion as 7.6%.[11]

Inclusion Criteria: Needle core biopsies of breast lumps, having adequate material, sent in a proper fixative (10% neutral buffered saline), were included in the study.

Exclusion Criteria: Inadequate specimens and the specimens sent in saline, water or inappropriate fixative were excluded from the study.

One hundred needle core biopsies done in breast lumps received for histopathological evaluation at the Department of Histopathology during the study period, were included in the study. The received specimens were fixed in 10% neutral buffered formalin for 6-12 hours, followed by grossing, processing, paraffin embedding, cutting on a microtome and slide making. The slides were manually stained with Hematoxylin and Eosin by an experienced lab technician. Microscopic evaluation was done by the consultant Histopathologist. The frequency of various breast lesions was analyzed, and they were categorized into different 'B' categories (B1–B5) according to Royal College of Pathologists guidelines.

Statistical Package for Social Sciences (SPSS) version 21.0 was used for the data analysis. Quantitative variables were expressed as Mean±SD and qualitative variables were expressed as frequency and percentages.

RESULTS

A total of 100 cases were included in the study. The age range was 35-60 years. The frequency of various pathologies was analyzed in 100 needle core biopsies, and they were categorized according to RCPath London (UK) reporting categories (B1–B5) as given in Royal College of Pathologists London (UK) datasets.

The lesions included in B1 category (Normal tissue) comprised 05(5%) cases, B2 category (Benign) 20(20%) cases, B3 category (Uncertain malignant potential) 12(12%) cases, B4 category (Suspicious for malignancy) 03(3%) cases and B5 category (Malignant) 60(60%) cases. Out of B2 (Benign) category lesions, fibroadenoma was the most common benign lesion (40%), followed by fibrocystic disease (25%). In contrast, out of B5 (Malignant) lesions, invasive ductal carcinoma, no special type (NST), was the most common (90.90%), followed by invasive lobular carcinoma (5.45%) (Table-I).

Table-I: Different reporting Categories Royal College of Pathologists, London and Diagnosis (n=100)

Reporting Categories	No. of Cases n(%)	Diagnosis n(%)	
B1	05(5%)	Normal tissue	
B2	20(20%)	Benign	
		Fibroadenoma	8(40%)
		Fibrocystic Change	5(25%)
		Granulomatous Mastitis	5(25%)
		Chronic Non Specific Mastitis	2(10%)
B3	12(12%)	**Lesion with Uncertain Malignant Potential**	
		Papillary Lesion	5(41.66%)
		Phyllodes Tumour	3(25%)
		Myofibroblastoma	2(16.66%)
		Atypical Ductal Hyperplasia (ADH)	2(16.66%)
B4	03(3%)	Suspicious of malignancy: 03(3%)	
B5	60(60%)	Malignant: 60(60%)	
Total	100(100%)		

B5 category (Malignant) cases were further subcategorized as per RCPath guidelines. Out of 60 B5 category (Malignant) cases, 04 were placed in the B5a subcategory (in Situ Carcinoma), 55 were in the B5b subcategory (invasive carcinoma), and only one case was assigned B5c category (in situ carcinoma present; however, invasive carcinoma could not be assessed). The subcategories of B5 (Malignant) lesions are shown in Table-II.

Table-II: Subcategories of B5 (Malignant) Lesions (n=60)

Subcategorization of B5 (Malignant) Lesions			
Subcategory	**No. of Cases n(%)**	**Diagnosis n(%)**	
B5a	04(6.66%)	**Carcinoma in Situ:**	
		Ductal Carcinoma in Situ	4(6.66%)
B5b	55(91.66%)	Invasive Carcinoma Invasive Breast Carcinoma, No Special Type	50(90.90%)
		Invasive Lobular Carcinoma	3(5.45%)
		Mucinous Carcinoma	2(3.63%)
B5c	01(1.66%)	**Carcinoma in Situ Present, however invasive carcinoma cannot be commented upon**	
		Ducal Carcinoma	1(1.66%)

DISCUSSION

In our findings, the RC Path reporting category system proved very effective, providing definite diagnoses in most cases. A previous study in which two hundred and ninety-five (295) women presenting with impalpable mammographic abnormalities were included. This study revealed B1 category lesions 20%, B2 category 30%, B3 category 16%, B4 category 4% and B5 category lesions included 30% cases.[12] Comparing this study with ours, B2, B3, and B4 category lesions are more or less equal to our results. However, the percentage of B1 category lesions in the study, as mentioned earlier, was high (20%) compared to B1 category lesions in our study, which were 5%. The reason may be that in our study, most of the breast lumps were clinically palpable, whereas, in the study, as mentioned earlier, impalpable mammographic abnormalities were analyzed.

Another significant difference was in the frequency of B5 category lesions, which was much higher in our study (60%) than in the study mentioned earlier, which was 30%. In another study, various Breast Imaging Reporting and Data System (BIRAD) Category breast lesions (BIRAD I – BIRAD V) were evaluated and compared with the reporting categories of needle core biopsies. In 467 cases included in this study, a high concordance was noted between the BIRAD Categories (II and V) and Needle Core Biopsy RCPath reporting categories (B2 and B5). Most of the lesions with BIRAD category II turned out to be B2 Category (Benign), while most BIRAD category V lesions were B5 (Malignant). The percentages of B2 and B5 category lesions were similar to those noted in our study.[13] In another study conducteda needle core biopsy was done on 116 patients with breast lumps, which revealed similar results to our study. The maximum number of cases (55.7%) were in the B5 category (Malignant), followed by B2 category (Benign) cases (38.1%).[14]

This Reporting Category System is followed only some over the world. Institutions like the College of American Pathologists (CAP) give the diagnosis in descriptive form, not assigning any specific category to the lesions.[15,16] Descriptive diagnosis, at times, maybe somewhat unequivocal, causing some ambiguity for the clinician to decide about the management. On the other hand, it is observed that most of the studies in which reporting categories of RCPath (B1–B5) were followed provided a precise diagnosis in most cases, giving a very clear direction to the clinician for further management.[17,18]

LIMITATION OF STUDY

In our study, one limitation was the age group of the patients, which were included in our study. As the centre in which this study was conducted provides free treatment to the families of retired personnel, most of the patients included were of relatively elderly age group. This may have brought some bias in the results of this study.

CONCLUSION

Needle Core Biopsies of breast lesions, if reported in accordance with the guidelines of RCPath (UK), placing them in B1-B5 categories, gives a definite diagnosis in most cases, providing a clear road map to the clinicians for accurate management of patients. B5 Category (Malignant) lesions are the most common histological outcomes of needle core biopsies, and Invasive Ductal Carcinoma, No Special Type (NST), is the most common histological type of malignancy.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

TS, SA & HT: Data acquisition, concept, study design, approval of the final version to be published.

YW, RR & TK: Data analysis, data interpretation, critical review, approval of the final version to be published.

SA & RR: Critical review, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Youn HJ, Han W. A Review of the epidemiology of breast cancer in Asia: Focus on Risk Factors. Asian Pac J Cancer Prev 2020; 21(4): 867-880. https://doi.org/10.31557/apjcp.2020.21.4.867
2. Stachs A, Stubert J, Reimer T, Hartmann S. Benign breast disease in women. Dtsch Arztebl Int 2019; 116(33): 565-574. https://doi.org/10.3238/arztebl.2019.0565
3. Escala-Garcia M, Morra A, Canisius S. Breast cancer risk factors and their effects on survival: A Mendelian randomisation study. BMC Med 2020; 18 (1): 327. https://doi.org/10.1186/s12916-020-01797-2
4. O'Mahony M, Comber H, Fitzgerald T, Corrigan MA, Fitzgerald E, Grunfeld EA, et al. Interventions for raising breast cancer awareness in women. Cochrane Database Syst Rev 2017; 2(2): CD011396. https://doi.org/ 10.1002/14651858.CD011396.
5. Solikhah S, Promthet S, Hurst C. Awareness level about breast cancer risk factors, barriers, attitude and breast cancer screening among indonesian women. Asian Pac J Cancer Prev 2019; 20 (3): 877-884. https://doi.org/10.31557/apjcp.2019.20.3.877
6. Mittal M, Deolia S, Agrawal A, Chaturvedi H, Agrawal G, Chhabra KG, et al. Prevalence of breast imaging reporting and data system (BIRADS) categories and breast consistencies in Central India -A cross-sectional survey. J Family Med Prim Care 2021; 10(9): 3219-3222. https://doi.org/10.4103/jfmpc.jfmpc10213_2494_20

7. Jang JY, Kim SM, Kim JH, Jang M, La Yun B, Lee JY, et al. Clinical significance of interval changes in breast lesions initially categorized as probably benign on breast ultrasound. Med (Baltimore) 2017; 96(12): e6415. https://doi.org/10.1097/md.0000000000006415
8. Karim MO, Khan KA, Khan AJ, Javed A, Fazid S, Aslam MI, et al. Triple assessment of breast lump: Should we perform core biopsy for every patient? Cureus 2020; 12(3): 74-79. https://doi.org/10.7759/cureus.7479
9. Garg P, Pathak P, Goyal R, Arora VK, Singh N. Current practice in handling and reporting needle biopsies: A hospital-based survey. Indian J Pathol Microbiol 2018; 61(2): 197-200. https://doi. org/10.4103/ijpm.ijpm_93_17
10. Jung I, Han K, Kim MJ, Moon HJ, Yoon JH, Park VY, et al. Annual trends in ultrasonography-guided 14-gauge core needle biopsy for breast lesions. Korean J Radiol 2020; 21(3): 259-267. https://doi.org/10.3348%2Fkjr.2019.0695
11. Toma A, O'Neil D, Joffe M, Ayeni O, Nel C, van den Berg E, et al. Quality of histopathological reporting in breast cancer: Results from four south african breast units. JCO Glob Oncol 2021; 7(7): 72-80. https://doi.org/10.1200/go.20.00402
12. Ginter PS, Idress R, D'Alfonso TM, Fineberg S, Jaffer S, Sattar AK,et al. Histologic grading of breast carcinoma: a multi-institution study of interobserver variation using virtual microscopy. Mod Pathol 2021; 34 (4): 701-709. https://doi.org/10.1038/s41379-020-00698-2
13. Ellis IO, Humphreys S, Michell M, Pinder SE, Wells CA, Zakhour HD; et al. UK national coordinating commmittee for breast screening pathology; European commission working group on breast screening pathology. Best Practice No 179. Guidelines for breast needle core biopsy handling and reporting in breast screening assessment. J Clin Pathol 2004; 57(9): 897-902.
14. Rageth CJ, O'Flynn EAM, Pinker K, Kubik-Huch RA, Mundinger A, Decker T, et al. Second international consensus conference on lesions of uncertain malignant potential in the breast (B3 lesions). Breast Cancer Res Treat 2019; 174(2): 279-296. https://doi.org/10.1007/s10549-019-05287-9
15. Richter-Ehrenstein C, Maak K, Röger S, Ehrenstein T. Lesions of "uncertain malignant potential" in the breast (B3) identified with mammography screening. BMC Cancer 2018; 18(1): 829. https://doi.org/10.1186/s12885-018-4742-6
16. Ibrahim AE, Bateman AC, Theaker JM, Low JL, Addis B, Tidbury P, et al. The role and histological classification of needle core biopsy in comparison with fine needle aspiration cytology in the preoperative assessment of impalpable breast lesions. J Clin Pathol 2001; 54(2): 121-125. https://doi.org/10.1136/jcp.54.2.121
17. Radhakrishna S, Gayathri A, Chegu D. Needle core biopsy of breast lesions–An audit of 467 needle core biopsies. Indian J Med Paediatr Oncol 2013; 34(4): 252-256. https://doi.org/10.4103%2F0971-5851.125237
18. Fattahi AS, Tavassoli A, Kalantari MR, Noorshafiee S. Evaluation of the value of core needle biopsy in the diagnosis of breast mass. Arch Breast Cancer 2016; 3(2): 56-61.

.....