Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

"DIAGNOSIS OF VARIOUS LESIONS OF BREAST BY FNAC AND THEIR CORRELATION WITH HISTOPATHOLOGY- TERTIARY HOSPITAL BASED RETROSPECTIVE STUDY."

AUTHORS: DR. INKAL GAJERA[1], DR. HARDIK MAKWANA[2],

DR. NAYANA LAKUM[3], DR. HIRAL PANDYA[4]

AFFILIATIONS: ASSISTANT PROFESSOR[1], ASSOCIATE PROFESSOR[2], PROFESSOR & HEAD[3], SENIOR RESIDENT[4]

GMERS MEDICAL COLLAGE JUNAGADH, GUJARAT, INDIA

CORRESPONDING AUTHOR: DR. INKAL GAJERA

ASSISTANT PROFESSOR

PATHOLOGY DEPARTMENT

GMERS MEDICAL COLLAGE JUNAGADH

ADDRESS: QUATER NO. 504, 5TH FLOOR, B1 BUILDING, GMERS MEDICAL COLLAGE CAMPUS, NEAR MAJEWADI GATE, MULLAWADA, JUNAGADH, GUJARAT, INDIA, PIN. NO. 362001

MOBILE NO.: 6352741810

EMAIL ID: inkalgajera02@gmail.com

ABSTRACT

INTRODUCTION:

Breast cancer increasing globally now days. Fine needle aspiration cytology (FNAC) has become most important method in preoperative diagnosis of breast lesions.[1] Breast lesions contains a wide variety of lesions comprising of most common benign lesions of breast are fibroadenoma to most malignant breast lesion are infiltrating ductal carcinoma.

METHODOLOGY

In this retrospective cross sectional study, After ethics committee approval study was start from obtaining retrospective data of FNAC breast from pathology department of GMERS medical collage Junagadh from January 2019 to December 2022. FNAC and histopathology slides of breast retrieved and reviews and findings are recorded. Then data will be classified according to diagnosis and tabulated in excel sheet. Sensitivity and specificity of FNAC diagnosis of benign and malignant lesions of breast will obtained.

RESULT

Out of 374 cases maximum cases were of benign breast lesions(209 cases/55.9%), 79 cases (21.15%) cases were of malignant breast lesion which includes 75 cases of IDC-NOS. Most benign breast lesions were in 15-45 years of age group. Most malignant lesions were in 31-60 years of age group. Site distributions of breast lesions were almost equal on both breasts.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

Sensitivity, Specificity, Positive predictive value and Negative predictive value of FNAC in our study were **81.25%**, **100%**, **100%** and **95.5%** respectively.

CONCLUSIONS:

Sensitivity, Specificity, Positive predictive value and Negative predictive value of FNAC in our study were **81.25%**, **100%**, **100%** and **95.5%** respectively. According our study FNAC is very sensitive and specific for palpable breast lesions.

KEYWORDS:

Palpable breast lesions, FNAC, Sensitivity, Specificity.

MAIN TEXT

INTRODUCTION:

Breast cancer increasing globally now days. Fine needle aspiration cytology (FNAC) has become most important method in preoperative diagnosis of breast lesions.[1] It can be performed with little complications and become popular due to its inexpensive and easy and fast approach. They range from wide variety of lesions ranging from malignant to benign lesions. Although malignant lesions are increasing especially in women of younger age group in present scenario, there for a total awareness is necessary for all the females of reproductive age group.[2]

Breast lesions contains a wide variety of lesions comprising of most common benign lesions of breast are fibroadenoma to most malignant breast lesion are infiltrating ductal carcinoma. Physical examination, core needle biopsy, mammography and fine needle aspiration cytology are very important methods in diagnosing of breast lesions[2.] fine needle biopsy is highly accurate and established in diagnosing breast lesions. The core biopsy is cost expensive and time consuming as compared to FNA procedure.[2]Most common sign and symptoms of breast lesions is a palpable lump, but it can be present as nipple discharge, inflammatory or radiological abnormalities.[3]

A single morphological feature cannot be relied upon to distinguish malignant cells from benign, so European and USA guidelines that categorizes breast lesions, based on 5 various cytological parameters, into different groups such as C1– Insufficient, C2- Benign, C3- Suspicious, probably benign, C4- Suspicious, Probably malignant, C5- Malignant.[1]

AIM & OBJECTIVES:

- To evaluate different lesions of breasts by FNAC and correlate FNAC with histopathology of palpable breast lesions.

With the specific objectives of

1. To differentiate and categorize various breast lesions by FNAC.
2. To study the correlation of FNAC with histopathology of palpable breast lesion.
3. To differentiate accuracy of FNAC of palpable lesions of breast.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

METHODOLOGY

- Study Design: Retrospective cross sectional study
- Study Population: All patients which came for FNAC breast in cytology section of pathology department of GMERS medical collage & general hospital, Junagadh from January 2019 to December 2022.
- Study Duration: 4 years
- Sample Size: Number of patients studied during 4 years for FNAC breast.
    - Inclusion criteria: All patients who came for FNAC breast lesions in cytology section of pathology department of GMERS medical collage & general hospital, Junagadh from January 2019 to December 2022.
    - Exclusion criteria: patients having other than breast lesion.
- Sampling Method- FNAC and histopathology slides of breast retrieved and reviews. All the slides are observed and findings are recorded.
- After ethics committee approval study will start from obtaining retrospective data of FNAC breast from pathology department of GMERS medical collage Junagadh.
- 4 years retrospective study carried out from January 2019 to December 2022 in pathology department of GMERS medical collage Junagadh.
- FNAC was done with 23 gauge needle following standard procedure under aseptic precautions, slides were air dried, fixed with ethyl alcohol and stained by haematoxyline & eosin and giemsa.
- Specimen received for histopathological study was processed and stained by H&E technique, followed by microscopic examination.
- FNAC and histopathology slides of breast retrieved and reviews. All the slides are observed and findings are recorded.
- Then data will be classified according to diagnosis and tabulated in excel sheet.
- Sensitivity and specificity of FNAC diagnosis of benign and malignant lesions of breast will obtained.

RESULT:

Table 1: number and percentage of various breast lesions according to category in cytology in present study

Category	FNAC diagnosis		No. of cases	% of cases
C1	Insufficient		62	18.4
C2	Benign	Acute inflammatory	35	9.4

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

		Chronic inflammatory		14	3.7
		Cystic	Benign cystic	23	6.1
			Galactocele	7	1.9
			Keratinous cyst	2	0.5
		Proliferative lesions		127	34
		Fat necrosis		1	0.3
C3	Suspicious probably benign			15	4.0
C4	Suspicious probably malignant			9	2.4
C5	Malignant			79	21.1
Total				374	100

Total 374 cases of FNAC breast studied, out of which 7 cases were male and 367 cases are female.

Out of 374 cases maximum cases were of benign breast lesions(209 cases/55.9%)

Out of 209 cases 127 cases (34%) were of benign proliferative lesions, which includes fibroadenoma, phylloides tumor and adenoma, 35 cases(9.4%) were of acute inflammatory infiltrate, 14 cases (3.7%) were of chronic inflammatory lesion in which most of the cases were of granulommatous mastitis, 23 cases (6.1%) were of benign cystic lesion, 7 cases (1.9%) were of galactocele, 2 cases (0.5%) were of keratinous cyst and 1 case (0.3%) was of fat necrosis.

79 cases (21.15) cases were of malignant breast lesion which includes 75 cases of IDC, 1 case of invasive papillary carcinoma or metaplastic carcinoma and 2 cases of medullary carcinoma.

15 cases (4%) were of category 3- Suspicious probably benign.

9 cases (2.4%) were of category 4- Suspicious probably malignant.

62 cases (18.45) were of category 1- Insufficient material.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

Table 2: age range among benign and malignant breast lesions

Age group		<15	15-30	31-45	46-60	61-75	>75
Category	FNAC diagnosis	No. of cases					
C1	Insufficient		15	23	18	6	1
C2	Benign	2	117	67	18	4	1
C3	Suspicious probably benign		2	9	2	1	1
C4	Suspicious probably malignant			3	3	1	1
C5	Malignant		3	31	27	15	3
Total			137	132	68	28	7

Most benign breast lesions were in 15-45 years of age group.

Most malignant lesions were in 31-60 years of age group.

Table 3: site wise distribution of various breast lesions

	Site	Right breast	Left breast	bilateral
Category	FNAC diagnosis	No. of cases		
C1	Insufficient	32	28	2
C2	Benign	102	104	3
C3	Suspicious probably benign	5	10	
C4	Suspicious probably malignant	4	5	
C5	Malignant	37	41	1
Total		180	188	6

Out of 374 cases 180 cases were of right breast, 188 cases were of left breast and 6 cases were of bilateral breast lesions.

In malignant lesion 37 cases were of right breast, 41 cases were of left breast and 1 case was of bilateral breast.

In benign breast lesion 102 cases were of right breast and 104 cases were of left breast.

Acute inflammatory lesions were more in right breast.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

Chronic inflammatory and cystic lesions were more in left breast.

Table 4: Cyto-histological correlation of various breast lesions.

Category	FNAC diagnosis	FNAC		Histo	
		No. of cases	% of cases	No. of cases	% of cases
C1	Insufficient	5	6.4	0	0
C2	Benign	56	71.8	62	79.5
C3	Suspicious probably benign	4	5.1	0	0
C4	Suspicious probably malignant	0	0	0	0
C5	Malignant	13	16.7	16	20.5
Total		78	100	78	100

Out of 374 cases 78 specimens were came for histological examination.

Out of 78 cases 13 cases found to be malignant by FNAC while in histopathology 16 cases were found to be malignant.

1 case of benign cystic breast lesion and 2 cases of benign proliferative breast lesion given cytology reporting are found to be malignant in histopathological examination.

	Histopathological diagnosis		Total
Cytological diagnosis	Malignant	Benign	
Malignant	13(True positive)	0(False positive)	13
Benign	3(False negative)	62(True negative)	65
Total	16	60	78

Category C1 to C3 had taken as benign lesion and category C4 to C5 taken as malignant.

Sensitivity= True positive/ (True positive + false negative) x 100=**81.25%**

Specificity= True negative/ (True negative + false positive) x 100=**100%**

Positive predictive value= True positive/ (True positive + false positive) x 100=**100%**

Negative predictive value= True negative/ (True negative + false negative) x 100= **95.5%**

DISCUSSION:

In present study benign proliferative breast lesion specifically fibroadenoma were most common lesion which is comparable to same result of Yalavarthi et al[4], Srikanth[5], Qasim et al[6], Tiwari[7], Domingauez et al[8] and Risaldar AA et al[9].

In this study majority of benign breast lesions were seen in 15-45 years of age group, which is similar to Risaldar AA et al[9], Rocha et al[10] (14-40 years) and Khemka et al[11] (15-44 years).

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

While in MacIntosh et [12] had majority of benign cases with in the age group of 27-77 years.

In our study majority of malignant breast lesion was IDC 75 cases (20%), which is in agreement with Srikanth[5] and Domingauez et al[8].

In present study distribution of breast lesion were almost equal on both breast which is similar to Sankaye et al[13]. While in Risaldar AA et al[9], Clegg-Lamtey and Hodasi[14], Reddy and Reddy[15] and Meena et al[16] have found more in left breast and Rupom et al[17] has found more in right breast.

Table : Statistical evaluation of breast lesions in various studies

Studies	Sensitivity	Specificity	Positive predictive value	Negative predictive value
Muhammed AZ et al[18]	90.6	100	100	99
Manju et al[19]	83.3	100	-	-
Varsha Pandey et al[20]	100	89.5	95.3	100
Risaldar AA et al[9]	91.66	100	100	98
Sankaye SB et al[13]	88.37	96.42	97.43	84.37
Shagufta et al[21]	90.65	96.84	97	90.19
Khageshan AP et al[22]	96.97	100	100	98.63
Present study	81.25	100	100	95.5

In present study sensitivity and specificity of FNAC were 81.25% and 100% respectively which were correlated with Manju et al[19] and Sankaye SB et al[13].

Positive predictive value of FNAC was 100%, which is correlated with Muhammed AZ et[18], Risaldar AA et [a9l] and Khageshan AP et al[22].

Negative predictive value of FNAC in present study was 99%, which is correlated with Risaldar AA et al (98%) and Khageshan AP et al[22](98%).

CONCLUSIONS:

Out of 374 cases maximum cases were of benign breast lesions(209 cases/55.9%), 79 cases (21.15%) cases were of malignant breast lesion which includes 75 cases of IDC-NOS.

Most benign breast lesions were in 15-45 years of age group.

Most malignant lesions were in 31-60 years of age group.

Site distributions of breast lesions were almost equal on both breasts.

Sensitivity, Specificity, Positive predictive value and Negative predictive value of FNAC in our study were **81.25%**, **100%**, **100%** and **95.5%** respectively.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

REFERENCES

1. Paulo Mendoza,1 Maribel Lacambra,1 Puay-Hoon Tan,2 and Gary M. Tse1 "Fine Needle Aspiration Cytology of the Breast: The Nonmalignant Categories" Pathology Research International Volume 2011, Article ID 547580, 8 pages
2. Shobha SN1,*, Rajashekar YR2 "Role of FNAC in Breast Lesions" Journal of Diagnostic Pathology and Oncology, January-March 2017;2(1):3-5
3. Touhid Uddin Rupom1 , Tamanna Choudhury 2 , Sultana Gulshana Banu 3 "Study of Fine Needle Aspiration Cytology of Breast Lump: Correlation of Cytologically Malignant Cases with Their Histological Findings" BSMMU J, Vol. 4, Issue 2, July 2011.
4. Yalavarthi S, Tanikella R, Prabhala S, Tallam US. Histopathological and cytological correlation of tumors of breast. *Med J Dr DY Patil Univ*. 2014;7(3):326–31. doi:10.4103/0975-2870.128975.
5. Srikanth S. Cytological & Histopathological correlation of Breast lesions –A study of one hundred cases. *Indian J Pathol Oncol*. 2017;4(2):273–7.
6. Qasim M, Ali J, Akbar SA, Mustafa S. Lump breast: Role of FNAC in diagnosis. *Prof Med J*. 2009;16:235–8.
7. Tiwari M. Role of fine needle aspiration cytology in diagnosis of breast lumps. *Kathmandu Univ Med J (KUMJ)*. 2007;5:215–7.
8. Domínguez F, Riera JR, Tojo S, Junco P. Fine needle aspiration of breast masses. An analysis of 1,398 patients in a community hospital. *Acta Cytol*. 1997;41:341–7.
9. Risaldar AA, Begum Z, Alvi U. Correlation of FNAC with Histopathology of breast lesions. *IP J Diagn Pathol Oncol* 2020;5(4):375-380.
10. Rocha PD, Nadkarni NS, Menezes S. Fine Needle Aspiration Biopsy of Breast Lesions and Histopathologic Correlation. *Acta Cytologica*. 1997;41(3):705–12.
11. Khemka A, Chakrabarti N, Shah S, Patel V. Palpable breast lumps: Fine-needle aspiration cytology versus histopathology: A correlation of diagnostic accuracy. *Internet J Surg*. 2009;18:1.
12. MacIntosh RF, Merrimen JL, Barnes PJ. Application of the Probabilistic Approach to Reporting Breast Fine Needle Aspiration in Males. *Acta Cytologica*. 2008;52(5):530 4.
13. Sankaye SB, Dongre SD. Cytological study of palpable breast lumps presenting in an Indian rural setup. *Indian J Med Paediatric Oncol*. 2014;35(2):159–64. doi:10.4103/0971-5851.138993.
14. Clegg-Lamptey J, Hodasi W. A study of breast cancer in korle bu teaching hospital: Assessing the impact of health education. *Ghana Med J*. 2007;41:72–7.
15. Reddy DG, Reddy CRR. Carcinoma of the breast, its incidence and histological variants among South Indians. *Indian J Med Sci*. 1958;12:228–34.
16. . Meena SP, Hemrajani DK, Joshi N. A comparative and evaluative study of cytological and histological grading system profile in malignant neoplasm of breast - An important prognostic factor. *Indian J Pathol Microbiol*. 2006;49:199–202.
17. Rupom TU, Choudhury T, Banu SG. Study of Fine Needle Aspiration Cytology of Breast Lump: Correlation of Cytologically Malignant Cases with their Histological Findings. *Bangabandhu Sheikh Mujib Med Univ J*. 2011;4(2):60–4.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

18. Muhammed AZ, Edino ST, Ochicha O, Alhasan SU. The value of fineneedle aspiration biopsy in preoperative diagnosis of palpable breast lumps in resource-poor countries: a Nigerian experience. *Ann Afr Med*. 2005;4:19–22.
19. Vala T M, Goswami A, Suri S.K. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2015 July;13(7):05-07.
20. Varsha Pandey1,*, Naveen Kumar Verma2, V. Sudarshan3, KS Chandrakar4, Anjana Sharma5" Cyto- histopathological correlation of breast lesions –A rural hospital based study" Indian Journal of Pathology and Oncology, January-March 2017;4(1):117-121
21. Koirala S. Comparative study of aspiration and non-aspiration cytology of palpable breast lumps and correlation with histopathology. Journal of Pathology of Nepal. 2014;4:639-643.
22. Khageshan AP, Wali S, Andola SK. Diagnostic Utility Of Fnac In Evaluation Of Breast Masses. *Int J Recent Scientific Res* . 2015;6(8):5827–31

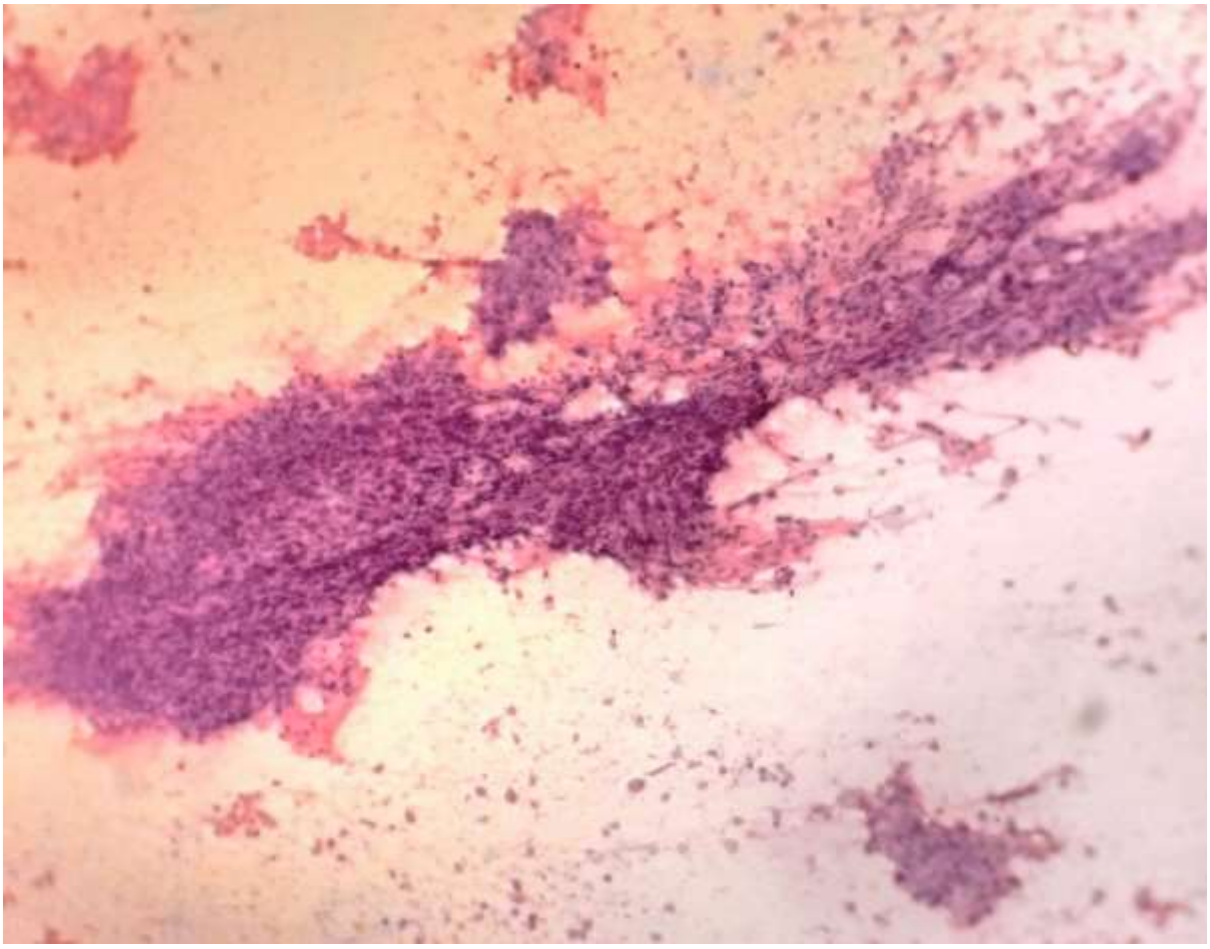

Figure1: photograph showing papillary tissue fragment with fibrovascular core of papillary carcinoma of breast in cytology(H&E stained smear in 10x view)

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

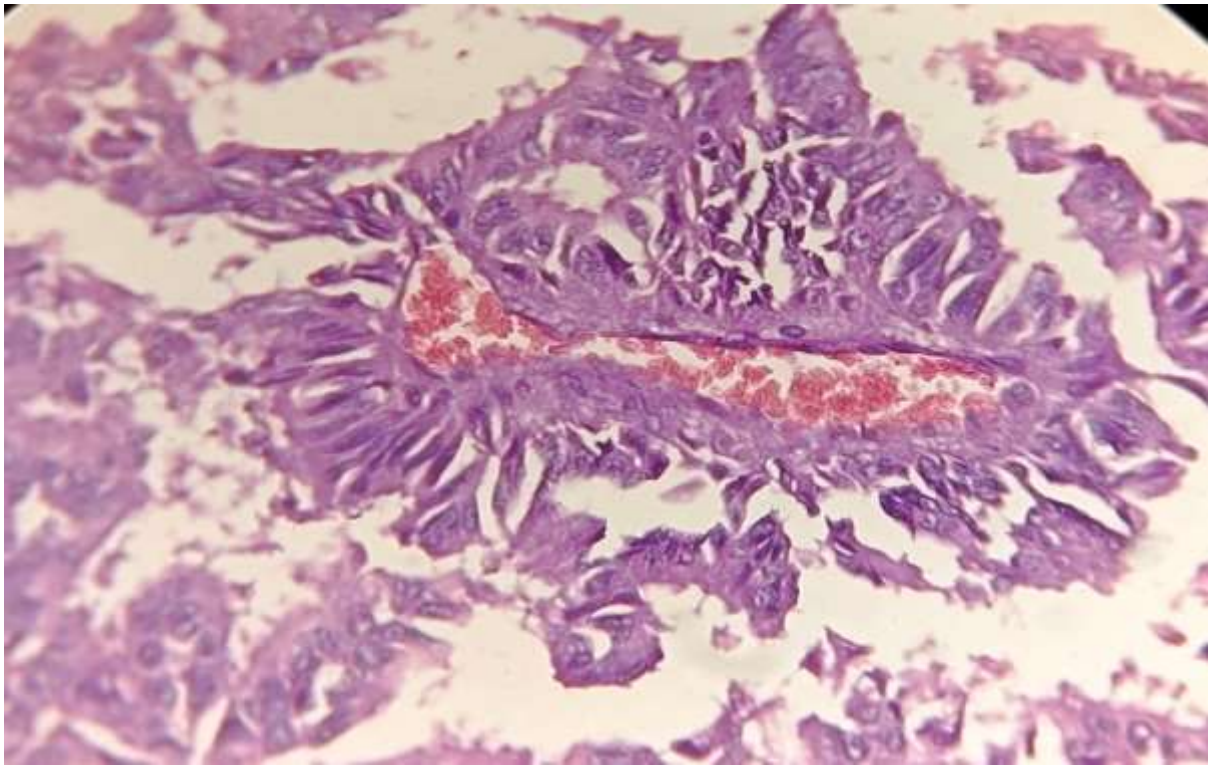

Figure2: photograph showing papillae with fibrovascular core invasive papillary carcinoma of breast in histopathology(H&E stained smear in 10x view)

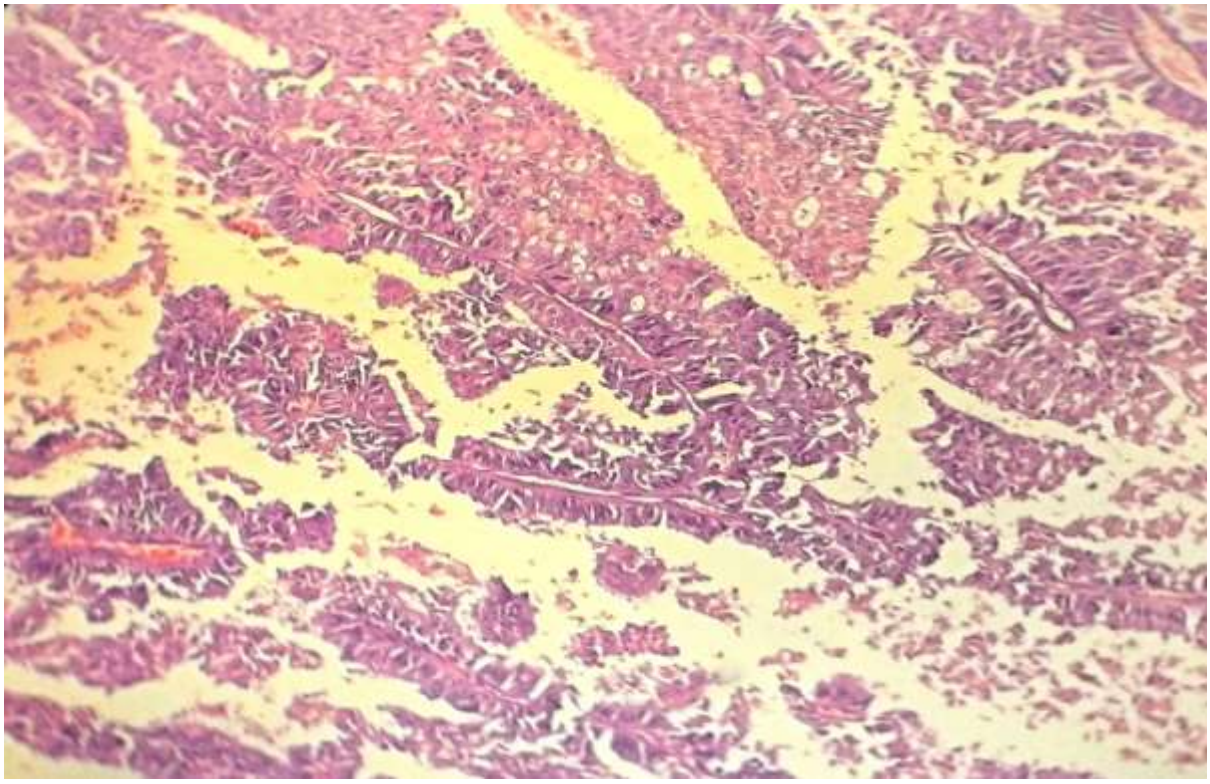

Figure2: photograph showing invasive papillary carcinoma of breast in histopathology(H&E stained smear in 4x view)

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

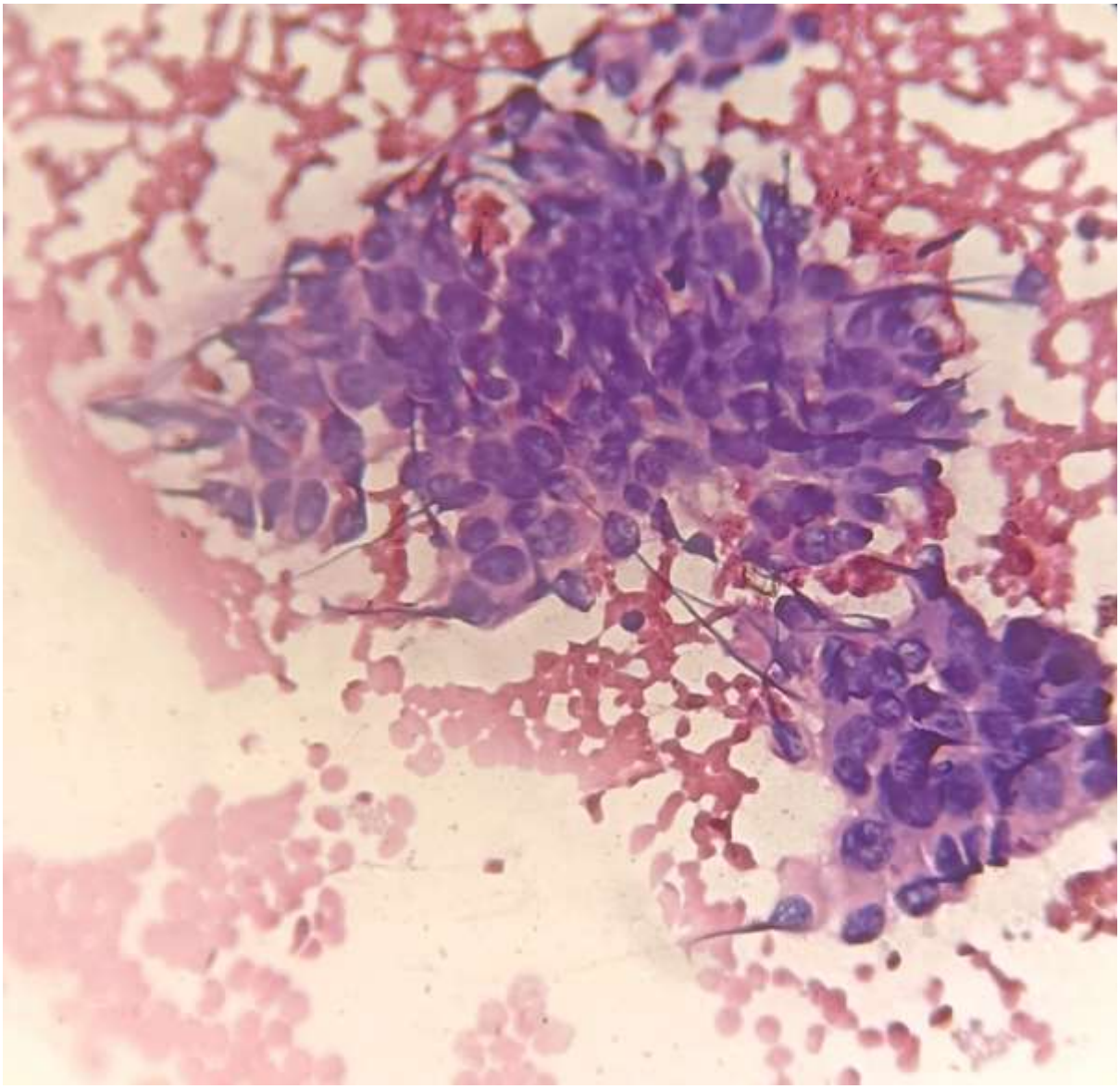

Figure3: photograph showing sheet of malignant ductal epithelial cells of infiltrating ductal carcinoma of breast in cytology(H&E stained smear in 40x view)

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

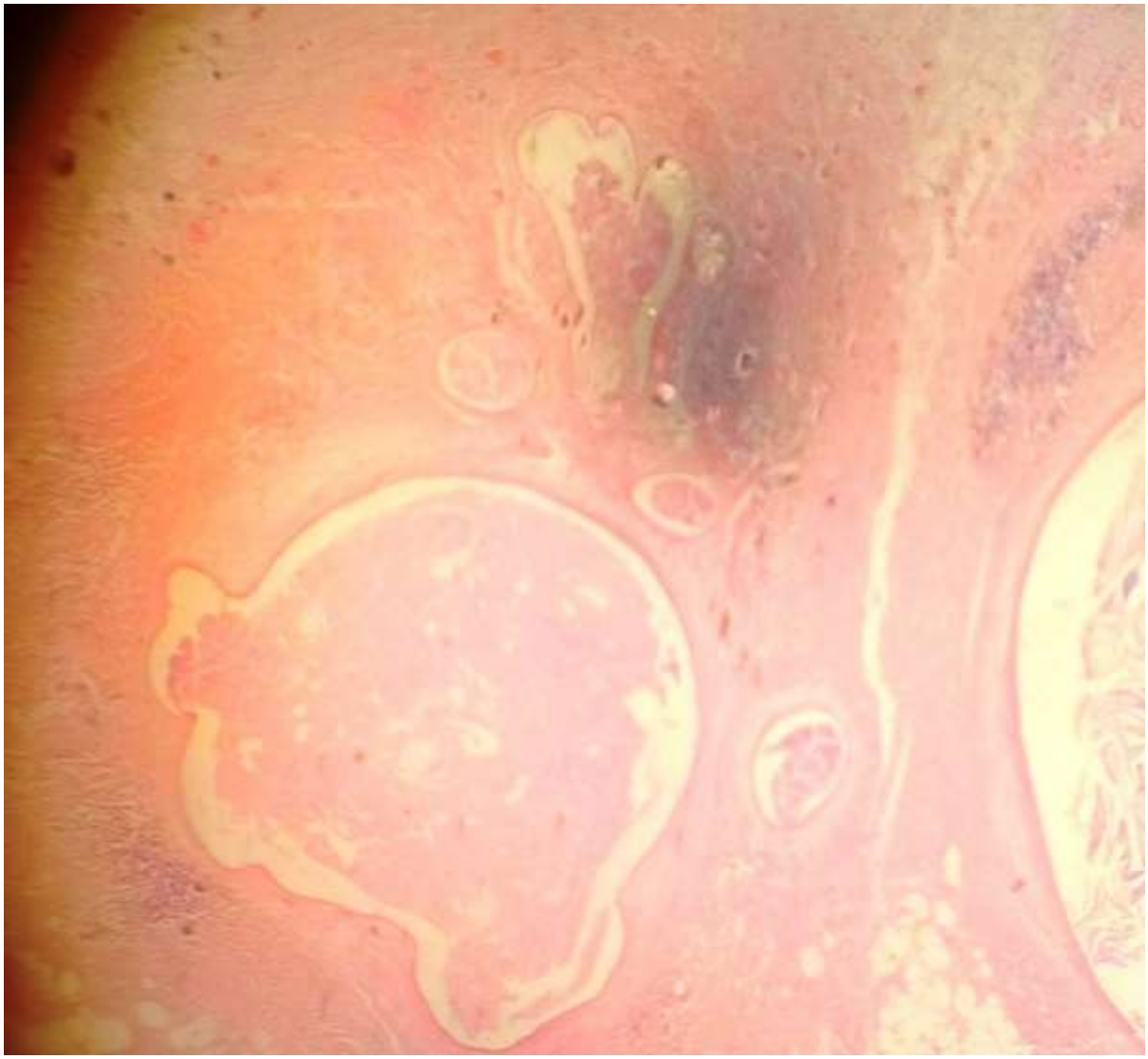

Figure4: photograph showing histopathology of galactocele (H&E stained smear in 4x view)

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

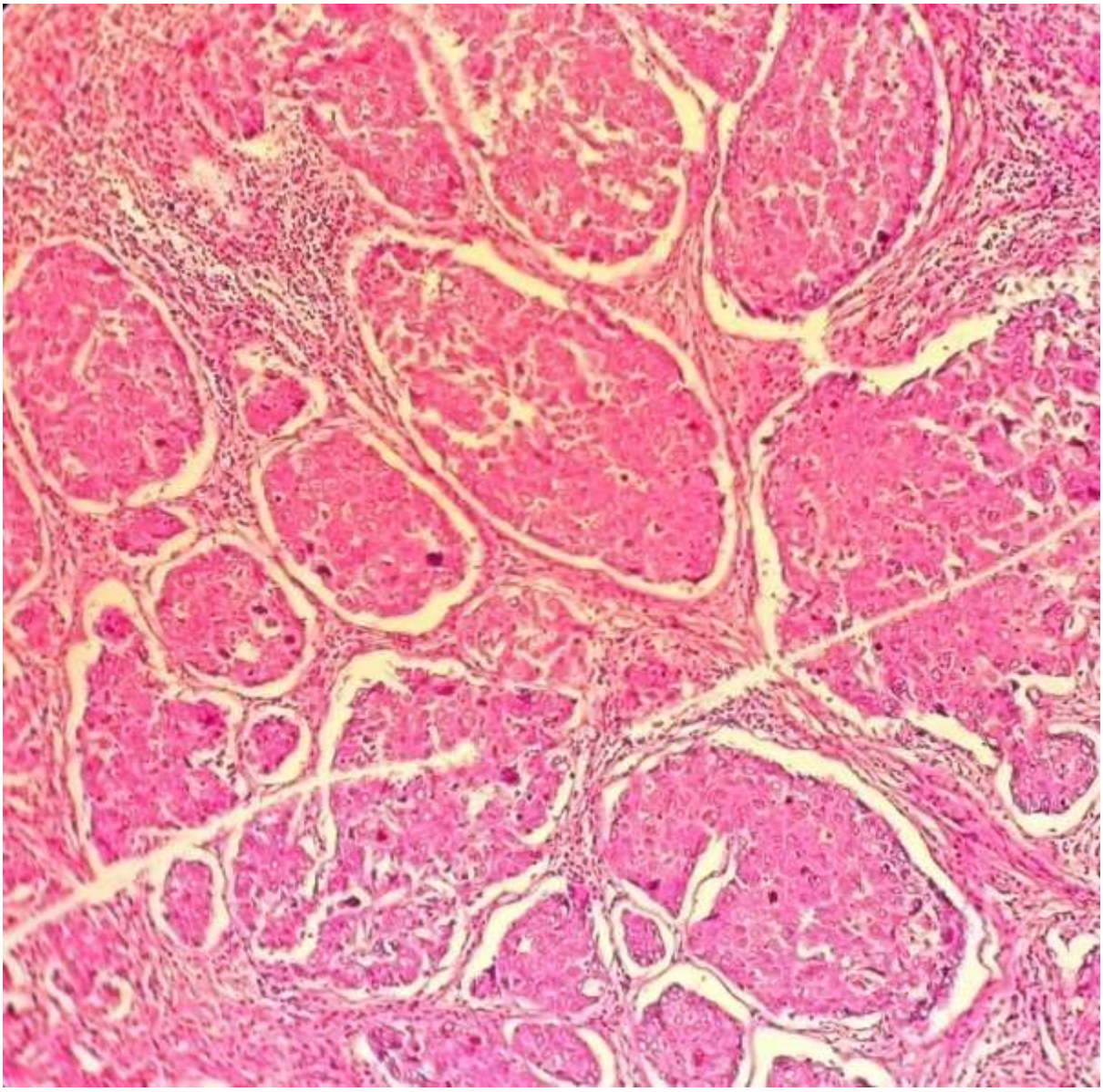

Figure5: photograph showing medullary carcinoma of breast in histopathology(H&E stained smear in 10x view)

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 09, 2023

Figure6: photograph showing histopathology of fibrocystic change in breast (H&E stained smear in 4x view)