



Correlation Between Clinical, Radiological And Pathological Findings In Benign (Non-Malignant) Lesions In Female Breast

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ABSTRACT

Introduction: Benign diseases account for approximately ninety percent of all clinical presentations related to breast internationally. **Aim of The study:** it is a trial to plan a proposed algorithm in dealing with benign breast lesions to differentiate cases that need just follow up or medical treatment from cases that need surgical intervention . **Methods:** 50 female patients had benign breast lesions between age of 15 and 75 years old were included in this study, all patients were subjected to clinical examination, mammography and (or) US and tru-cut needle biopsy, we excluded patients with breast lesions proved to be malignant. **Results:** in comparison to results of histopathology examinations, we found that for clinical examination; the sensitivity was 83.73%, specificity was 92.15%, positive predictive value (PPV) was 83.73% and negative predictive value (NPV) was 92.15%, For combined radiological approach (mammography and/or US); sensitivity was 98.7%, specificity was 98.61%, PPV was 98.7% and NPV was 98.6%. **Conclusion:** pathological examinations had the best sensitivity followed by radiology, while the clinical examination had the lowest sensitivity, so in most cases we should not rely on results of the clinical examination alone without radiological investigations. **Recommendations:** benign breast lesions can be diagnosed clinically and confirmed by radiological imaging and tru-cut biopsy for early, reliable and accurate diagnosis.

Keywords: lump; mammography; physical examination; tru-cut; ultrasonography.

INTRODUCTION

Mammary gland is considered a unique organ, as at birth it is not fully formed, but it undergoes cyclical changes in reproductive life, so some of diseases of breast occur in reproductive life, while others occur in menopausal period indicating the relation of breast diseases to hormonal stimulation as a causative factor [1]. In menstruating females,

benign breast lumps constituting up to 90% of all palpable lumps of the breast [2]. In the western world, benign diseases of breast constituting ten times more common than malignant breast diseases [3]. Benign diseases account for approximately ninety percent of all clinical presentations related to breast internationally [4]. There is a wide variety of histological entities of benign breast lesions, which are sub divided into

non-proliferative and proliferative breast lesions, which include proliferative breast lesions with atypia and proliferative breast lesions without atypia [5]. In most studies, fibro-adenoma and fibrocystic disease of the breast represent the most frequent benign lesions of the breast [6]. Some of the benign proliferative lesions have a risk of progression to be malignant [7]. With increase using of mammography, discover of accidental lesion in asymptomatic patient is increased [8]. Triple assessment of the breast including clinical examination, mammography/ ultrasound and

MATERIALS AND METHODS

This was a prospective study conducted in Beni-Suef University hospital within two years from April 2019 to April 2021 involving 50 female patients had benign lesions in the breast between age of 15 and 75 years old. Detailed information was given to the study group and written consents were attained. Inclusion criteria were; female patients between 15 and 75 years old, had benign breast lesions diagnosed by clinical examination, soft tissue mammography and (or) US and tru-cut needle biopsy. Patients were excluded from this study when; the age was less than 15 years old, or more than 75 years old, patients with breast diseases proved to be malignant by clinical examination, soft tissue mammography and (or) US and tru-cut needle biopsy, pregnant patients and patients with obvious breast cancer at the time of examination or had a history of cancer in other breast.

All patients were subjected to:

A. At the first visit:

- 1.Full history taking; including personal history, menstrual history, medical history and family history of breast diseases.
- 2.Clinical examination: complete general examination, local examination of both breasts. then we examined axillary tail, then both sides of axillae and then cervical, supraclavicular and infraclavicular lymph nodes were felt.
- 3-Radiological investigations: ultrasonography and soft tissue mammography were done for

pathological examination is better to prove accurate diagnosis and to plan the treatment [9]. Tru-cut needle biopsy is considered now one of the most useful means of obtaining histopathological diagnosis, it is easy and usually performed in outpatient clinic so we avoid unnecessary excisional biopsy [10]. It is noted that non-malignant breast pathology is neglected when compared to breast malignancy, in spite of benign abnormalities represent 90% of clinical presentations associated with the breast [11].

women above 35 years old, while US alone was done for those who are less than 35 years old. MRI was done when mammogram and/or US didn't reach to a definite diagnosis. The mammography machine used was; model name: ALPHA RT., GE Hungary Kft. Manufactured 2012, model no: MGF-101. We used diagnostic mammography with views included the cranio-caudal view (CC) and the medio-lateral oblique view (MLO).Ultrasound machine used in our study was GE LOGIQ P5.

4-Pathological investigations; US-guided tru-cut needle biopsies were done for all patients. At first, an informed consent was attained. Patient was exposed from waist upwards and lying supine at 45°. Under complete aseptic technique, a 2% Lignocaine local anesthetic was infiltrated and a very small skin incision was done. Biopsy specimens were obtained by means of four successive insertions into the lesion, collected tissue cores were fixed in 10% neutral buffered formalin for 24 hours, wet fixed cores were dehydrated, and then cleared in xylene. At the last, tissue cores were embedded in paraffin. Sections of 4 microns thickness were obtained, stained with Hematoxylin and Eosin stain and then examined under the light microscope.

5-A schedule of next visits was given to patients.

B. Follow up:

- Patients were reviewed at regular intervals, all patients were subjected to general and local examination on both breasts and axillae on both sides every 3 months throughout study.
- All patients were subjected to US for ipsilateral breast every 6 months, while mammography was done every one year for patients above 35 years old

throughout the study.

-Pathological re-evaluation was done if any of the clinical and/or radiological findings changed.

Data Analysis:

The collected data were coded and statistically analyzed using SPSS (Statistical Package for Social Science) version 25. Data were expressed using mean, SD (standard deviation), median, minimum and maximum in quantitative data and using frequency (number of cases) and relative frequency (percentages) for categorical data. P-values less than 0.05 was considered as statically significant.

RESULTS

This study was conducted at Beni-Suef university hospital on 50 female patients with benign breast lesions, the age of patients ranged from 15 to 75 years old with a mean age of 33.76 years and median age of 36 years. Patients' distribution according to age groups; 22 patients (44%) in age group from 15-30 years old, 23 patients (46%) in age group from 31-45 years old, 4 patients (8%) were from 46-60 years old and one patient (2%) was in age group from 61-75.

Clinical presentations; 24 patients (48%) presented with a lump only, 6 patients (12%) had pain alone, 16 patients (32%) had a lump with pain and 4 patients (8%) had nipple discharge with pain. We found that; 18 patients (36%) had bilateral breast lesions, 16 patients (32%) had the lesion on right side and 16 patients (32%) had the lesion on left side. The majority of lesions were in the upper outer quadrant alone 21 patients (42%). By clinical examination; 40 patients (80%) had lumps ranging in size from about 0.5 cm to 3.5 cm in its greatest dimension, while 10 patients (20%) had no lumps. Nipple and areola look normal in 49 patients (88%), only one patient (2%) had bilateral congenitally retracted nipples. Skin looks normal in 45 patients (88%), while 5 patients (10%), had some redness and light brown discoloration from long lasting inflammation.

Breast US was done for 50 patients (100%). Mammography was done for patients above 35

years old (27patients). 48 patients (96%) were between BIRADS 1 and BIRADS 3, while 2 patients (8%) were BIRADS4a. The diameter of the mass (in mammogram/ US) ranged from 0.5 cm to 3.5 cm in its greatest dimension, the largest mass was breast abscess 3.5 cm in greatest dimension (3.5x2.1 cm), while the smallest mas was fibroadenoma 0.5 cm in its greatest dimension (0.5x0.4 cm). Tru-cut needle biopsy were done for all 50 cases. Regarding histo-pathological examination, there was no evidence of atypia, metaplasia or dysplasia in all 50 cases. However, other findings including ductal hyperplasia, focal fibrosis, adenosis and dilated ducts were seen in 14, 20, 21 and 10 patients, respectively.

Most patients had more than one type of lesions as follow; 18 patients (36%) had only one type, while 32 patients (64%) had more than one type of lesions. The most common lesion was fibroadenoma (26 patients), followed by fibrocystic disease (19 patients) and followed by

breast abscess (5 patients). In patients had more than one type of benign lesions; associated lesions (beside the main pathology) were; simple cyst in 14 patients, major duct-ectasia in 8 patients, axillary lymphadenopathy in 19 patients, macro-calcification in 3 patient. Fibroadenomas diagnosed clinically were 24/26 (as clinical examination in 2 patients was difficult because of huge breast and small-sized lesion), fibroadenomas diagnosed radiologically were 25/26 (as one case didn't appear clearly as fibroadenoma and the case was confirmed by tru-cut needle biopsy), on histo-pathological examination, 26 cases were confirmed as fibroadenomas. Fibrocystic diseases diagnosed clinically were 15/19 (in 4 cases the breast was huge and the lesion was small in size so, clinical examination was difficult) while fibrocystic diseases diagnosed radiologically were 19/19 and on histo-pathological examination 19 cases were confirmed as fibrocystic disease. Chronic breast abscesses diagnosed clinically were 4/5, as in one case the lesion had a very hard mass that needed additional evaluations to exclude malignancy, while chronic breast abscesses diagnosed radiologically were 5/5, on histo-pathology all 5 cases were confirmed as

chronic breast abscess. Of all 50 cases of this study, 43 cases (86%) were diagnosed clinically and 49 cases (98%) were diagnosed radiologically in comparison to results of histopathology examinations.

Table 1 : Clinical and radiological results in correlation with histopathology examination for all cases.

<i>For all cases</i>	<i>Clinical examinations</i>	<i>Radiological investigations</i>
<i>Sensitivity</i>	83.73%	98.7%
<i>Specificity</i>	92.15%	98.61%
<i>positive predictive value</i>	83.73%	98.7%
<i>Negative predictive value</i>	92.15%	98.6%

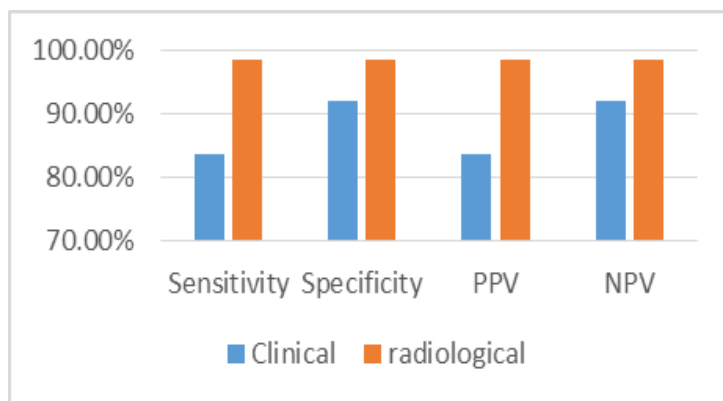


Figure 1: sensitivity, specificity, PPV and NPV of Clinical and radiological examination in correlation with histopathology results for all cases in our study.



Figure 2: Fibroadenoma, in 38 years old patient:-To left : Mammography (RT.CC).
- To right : Mammography (RT.ML).

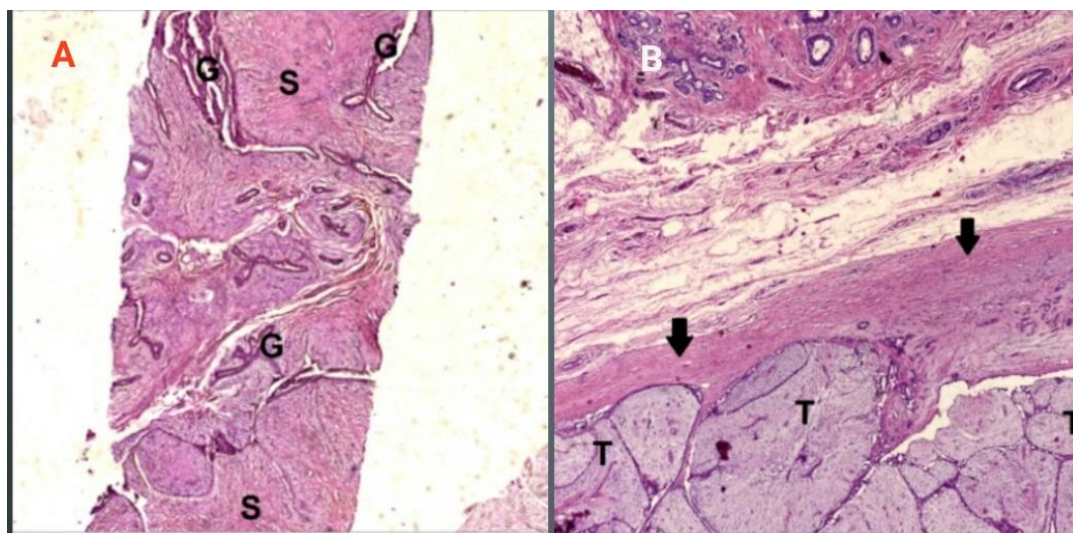


Figure 3 : Pathological findings in 38 years old patient diagnosed as fibroadenoma (the same case in figure 2):

A-Pathological findings (tru-cut needle biopsy): Fibroadenoma, intra-canalicular growth pattern, core needle biopsy showing branching compressed glands (G) and proliferating stroma (S) (H&E 2.5x).

B- Pathological findings (excisional biopsy): Fibroadenoma, excision biopsy of the same patient showing well-circumscribed tumor (T) surrounded by pseudo-capsule (arrows) (H&E 2.5x).

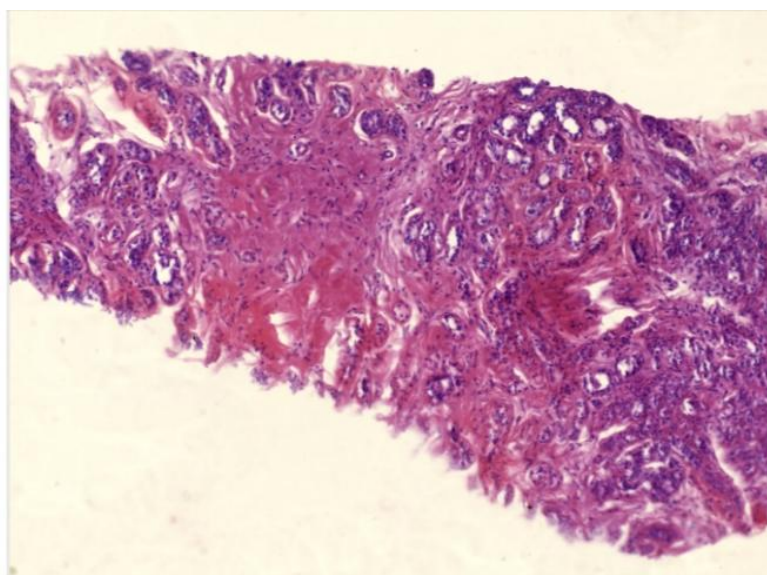


Figure 4: Fibroadenosis: breast tissue core showing increased number of acini (adenosis) (H&E 10x).

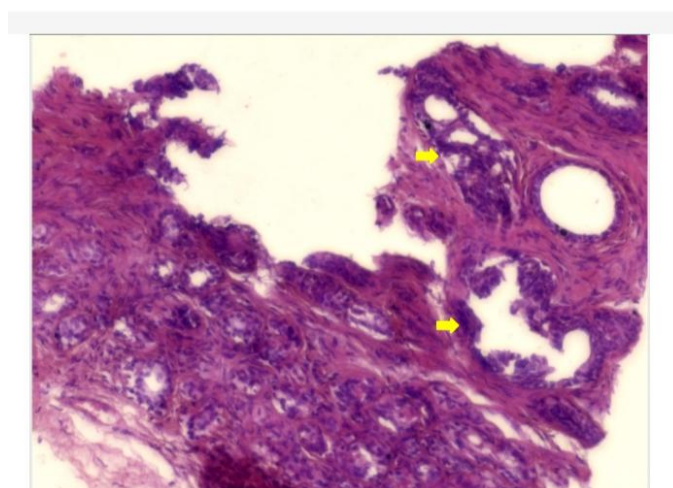


Figure 5: The same case showed in figure 4, showing ductal epithelial hyperplasia (arrows) (H&E 20x).

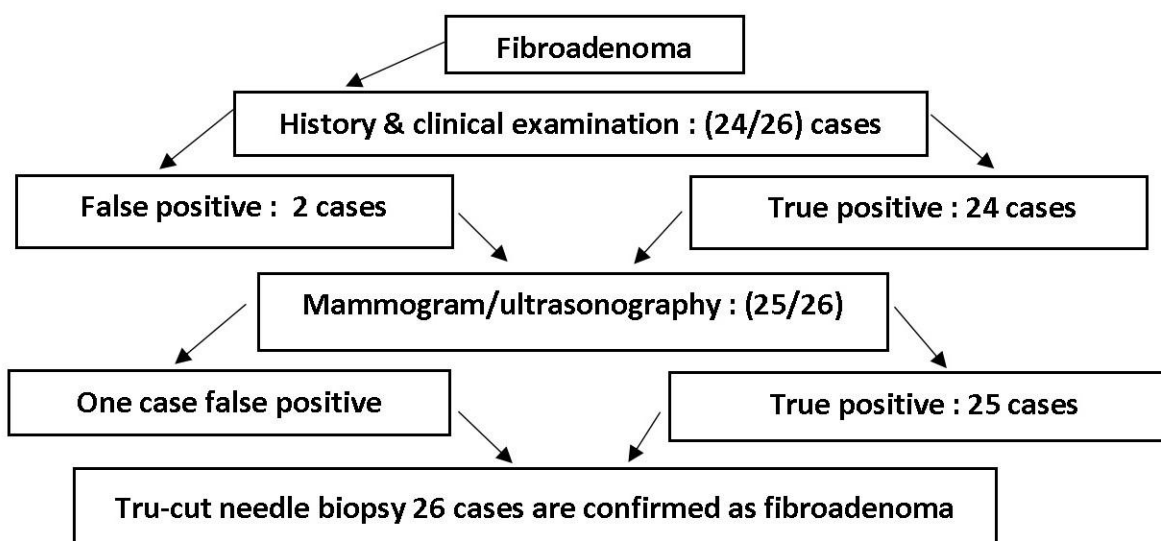


Figure 6: Algorithm for our study fibroadenoma cases.

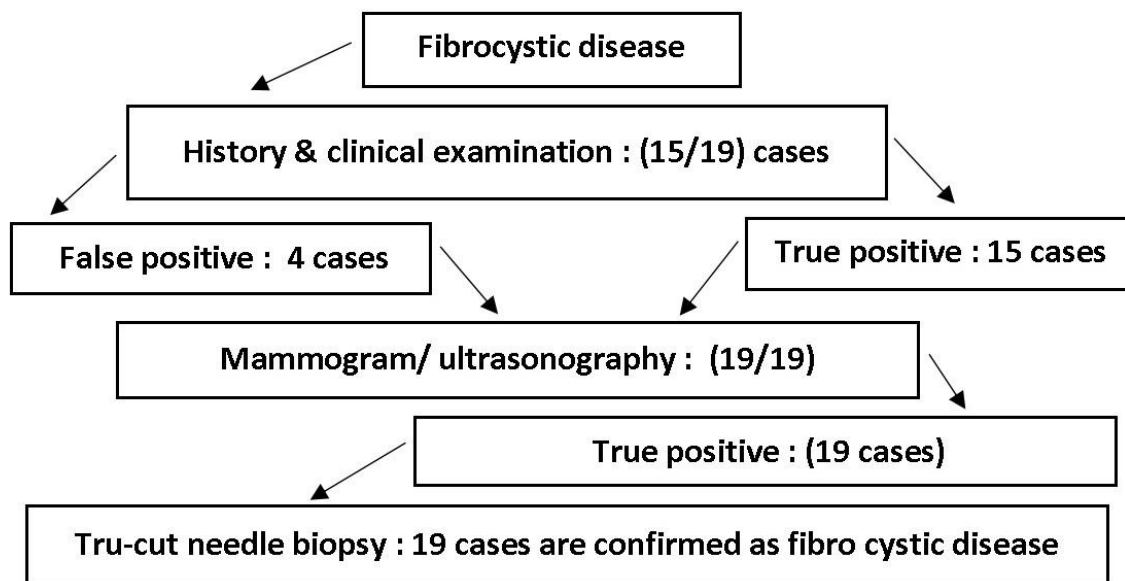


Figure 7: Algorithm for our study fibrocystic disease cases.

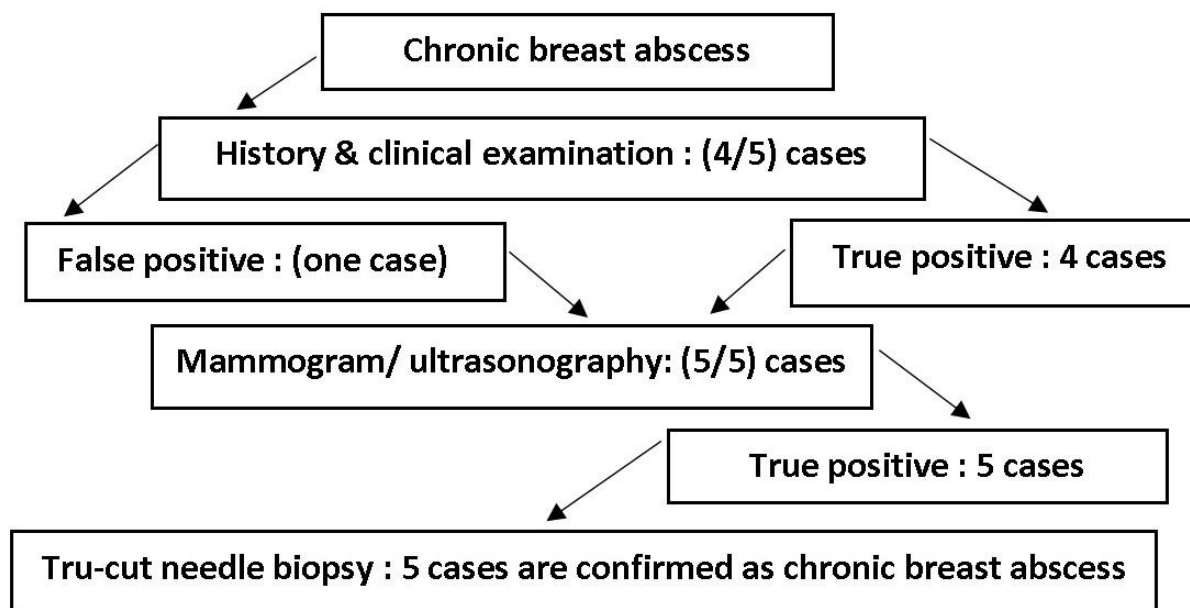


Figure 8: Algorithm for our study chronic breast abscesses.

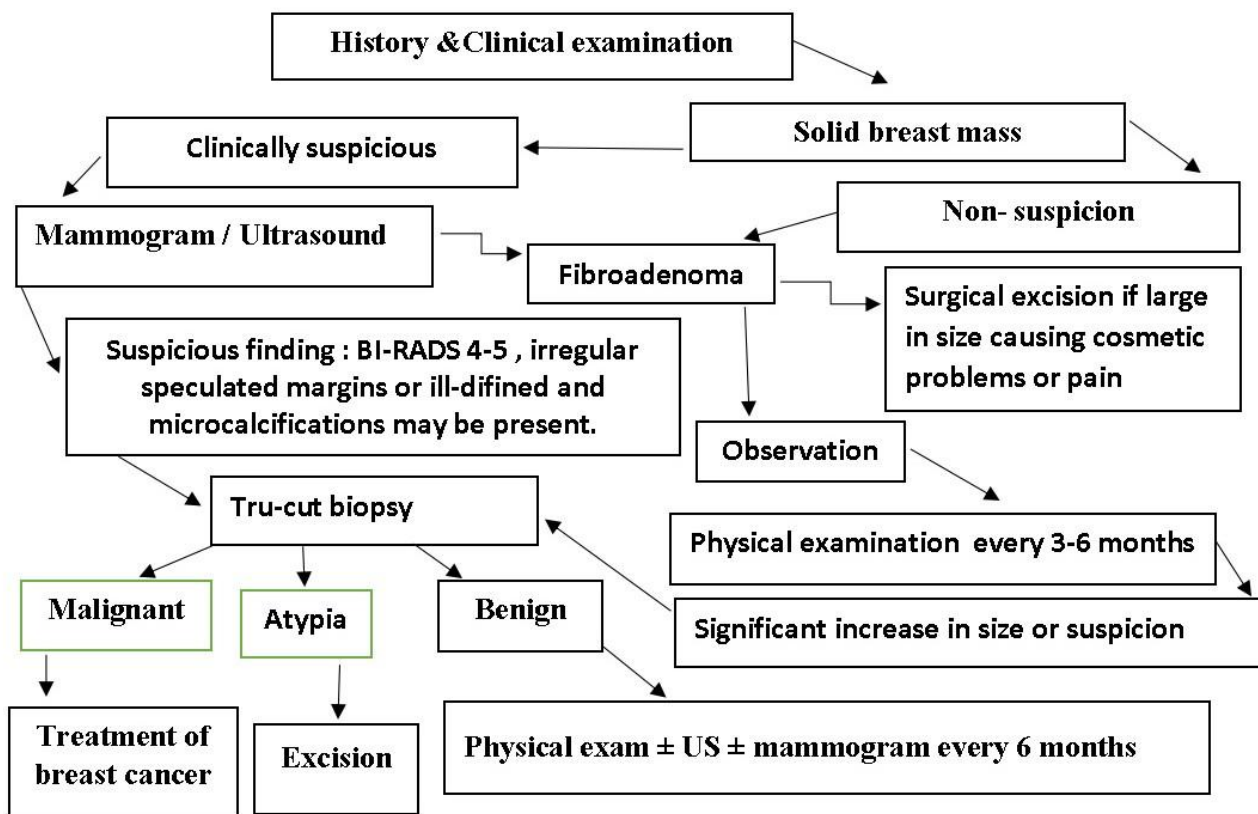


Figure 9: our recommendations for dealing with fibro-adenoma cases and other solid breast masses from our results.

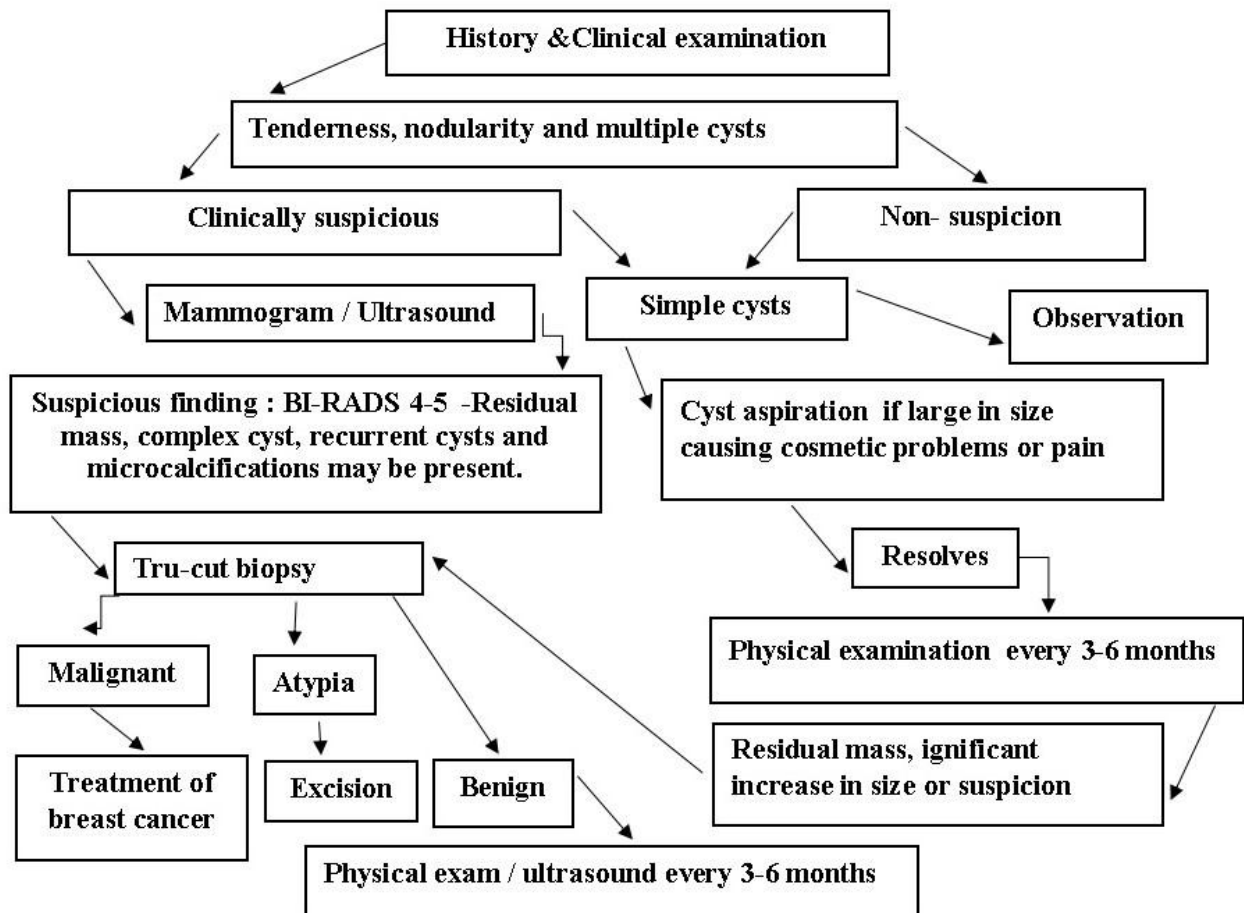


Figure 10: our recommendations for dealing with cystic breast lesions cases from our results.

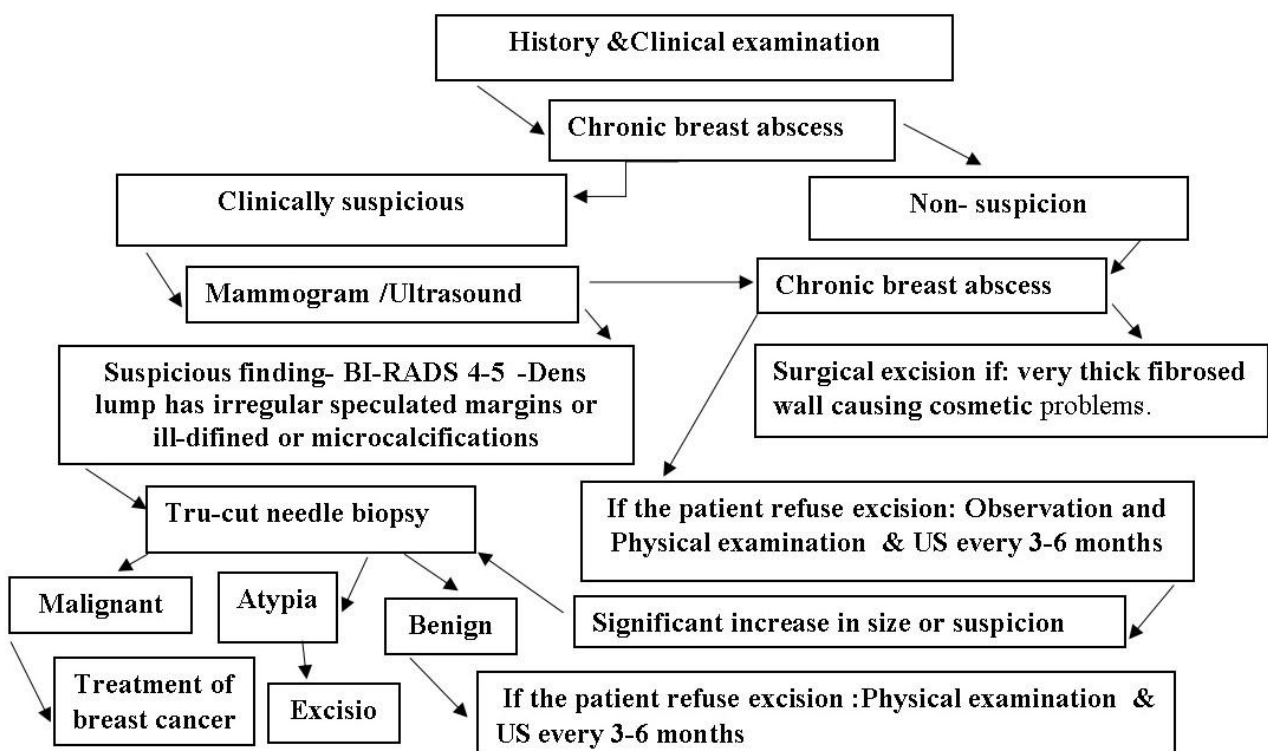


Figure 11: our recommendations for dealing with chronic breast abscess cases from our results.

DISCUSSION

Benign lesions of the breast are much more frequent than malignant lesions of the breast. Females may have a specific complaint due to breast disease, or may have an abnormality detected with screening mammography, which lead to identification of the benign disease [12]. BBDs represent a spectrum of breast lesions that range from developmental abnormalities, inflammatory breast lesions, epithelial and stromal proliferations to numerous benign neoplasms [13]. Benign processes of the breast may be asymptomatic or have variable manifestations. A lot of symptoms and signs presented in different diseases of the breast are nonspecific and necessitate further assessment by using of radiological imaging and then biopsy to confirm the diagnosis [14]. The increase that occurs in breast awareness leads to increase in number of females who present to breast outpatient clinics for evaluation of a breast abnormality [15].

In our study, we tried to address the correlation between clinical, radiological and pathological findings in benign (non-malignant) lesions in female breast. For this purpose, we included 50 female patients between 15 and 75 years with benign breast lesions and excluded patients with breast diseases proved to be malignant by clinical examination, soft tissue mammography and (or) US and tru-cut needle biopsy. In our study, the most common breast lesion was fibroadenoma, (constituted 52% of cases), fibrocystic disease was the next common constituted 38% of cases and then breast abscess constituted 10% of cases. Our findings were near to Selvakumaran et al., (2017), [16] they found that fibroadenoma was the most common lesion (55.9%) followed by fibrocystic disease (20.8%) and then inflammatory breast lesions (7.1%), also Brajesh et al., (2018), [17] found that, the most common lesion was fibroadenoma (42%), followed by fibrocystic disease (16%) and then breast abscess (13%).

In our study, 24 patients (48%) presented with a lump only, 6 patients (12%) complained of pain alone, 16 patients (32%) complained of a lump

with associated pain and 4 patients (8%) complained of nipple discharge with pain. Our results were compared to Koorapati et al., (2017)[14] who found that 68% of cases complained of painless breast lumps, 24% of cases complained of breast lumps with pain, 6% of cases complained of painful breast lumps in association with nipple discharge and 2% of cases had nipple discharge only.

In our study, 40 patients (80%) had mass. Size of mass ranged from 0.5 cm to 3.5 cm in its greatest dimension, the largest mass was breast abscess 3.5 cm in its greatest dimension (3.5x2.1 cm), while the smallest mass was fibroadenoma 0.5 cm in its greatest dimension (0.5x0.4 cm). Rajkumar, et al., (2017), [18] reported that most of breast lumps (73.85%) were less than 5 cm in size (in their greatest dimension), while 26.1% of cases had a lump more than 5 cm in its greatest dimension. In our study the majority of breast lumps were in the upper outer quadrant; 21 patients (42%) had lesions in upper outer quadrant alone. Our results were near to Rajkumar, et al., (2017), [18] they reported that in 45.1% of cases, the breast lump was in upper outer quadrant, while Sagar et al., (2015), [19] found that: in 36% of cases the lesion was located in upper outer quadrant.

For all cases in our study; sensitivity of clinical examination was 83.73%, specificity was 92.15%, positive predictive value was 83.73% and negative predictive value was 92.15%. Our results were compared to results of Aniketani et al., (2015), [20] they found that; in diagnosis of benign breast lesions, the clinical examination had a sensitivity of 93.66%, Specificity of 91.66%, positive predictive value of 93.33% and negative predictive value of 91.66%.

For all cases in our study; for combined approach (mammography and/or US); sensitivity was 98.7%, specificity was 98.61%, positive predictive value was 98.7% and negative predictive value was 98.6%. Our results were near to Aniketani et al., (2015), [20] they reported that; in diagnosis of benign breast lesions, mammography had a sensitivity of 96.55%, specificity of 95.65%, positive predictive value of 96.55% and negative

predictive value of 95.65%. Our results were near to Hemant Kumar et al., (2016),[21] they found that; in diagnosis of benign breast lesions, for combined approach (mammography/ US); sensitivity was 97.30%, specificity was 100% and positive predictive value was 100%.

CONCLUSIONS

By correlation between clinical, radiological and pathological findings, pathological examinations had the best sensitivity followed by radiology, while the clinical examination had the lowest sensitivity, so in most cases we should not rely on results of the clinical examination alone without radiological investigations. The study recommends that benign breast lesions can be diagnosed clinically and confirmed by radiological imaging and tru-cut biopsy for early, reliable and accurate diagnosis.

List of abbreviations:

BBDs: benign breast diseases.
CC: cranio-caudal view.
ERC: ethical research committee .
H&E: Hematoxylin and Eosin stain.
MLO: medio-lateral oblique view .
NPV: negative predictive value.
PPV: positive predictive value.
SD : standard deviation.
US: ultrasound.

Consent to participate

we explained the study to all participants, and informed consents were obtained from them.

Ethical approval:

The study was approved by the ethical research committee (ERC) of Beni-Suef university/Faculty of Medicine in: 26/3/2019.

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Conflicts of interest

Authors didn't report any conflict of interest.

Availability of data and materials

All data presented during our study were included in this article.

Authors contributions

All authors had an equal contribution .

Consent of publication

We confirm that informed consent to publish data was obtained from all participants.

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