

*Full Length Research Paper*

## **Benign breast tumors in Red Sea State, Sudan**

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The majority of breast tumors are benign. Some of these tumors carry risk that change into cancer. So, it is important to know the different histopathological patterns of the benign breast lesions. This will help in the proper diagnosis of the lesion and build up of potent programs against the cancer. This research classifies benign breast diseases according to their frequency in Red Sea State, Sudan and compares them to the age and sex of the patients. Six hundred and eighty-nine specimens were examined in the period from December 2005 to October 2010 in a histopathological laboratory in the Red Sea Medical center, Portsudan, Sudan. This is the only regional laboratory, to which surgical biopsies and fine needle aspiration cytology were sent. For the histopathological specimens, only Haematoxylin and Eosin (H & E) staining was done. Slides of the fine needle aspiration cytology (FNAC) were stained by Papanicolaou and May-Grunewald Giemsa (MGG) stains. Five hundred and sixty-seven breast specimens out of the 689 were proved to be benign in nature. The commonest type of benign breast tumor in Red Sea State was fibrocystic disease of the breast (39.3%), followed by Fibroadenoma (30.2%). Acute mastitis came next (in the order of frequency) to above breast lesions (5.8%). The fourth common benign breast disease was benign phyllodes tumor (5.7%). The commonest age of presentation was between 20 to 29 years. On other hand, malignant tumors most commonly appear at the age between 40 to 49 years. In this study, 680 of the cases were females and nine cases were males. Benign breast tumors were more common compared to malignant breast tumors with a ratio of 4.6:1. Fibrocystic disease of the breast was the commonest benign breast lesion in Red Sea State. Benign breast lesions are commonly present in the early adult age group (20 to 29 years) (45%), whereas malignant breast lesions commonly appear at age between 40 to 49 years (31.9%). At least, FNAC before surgery or histopathological study after surgery should be done to any lady complaining of a palpable breast mass in our region.

**Key words:** Breast, benign, tumors, Portsudan.

### **INTRODUCTION**

The vast majority of the lesions that occur in the breast are benign. Much concern is given to malignant lesions of the breast because breast cancer is the most common malignancy in women worldwide; however, benign lesions of the breast are far more frequent than malignant ones (Caleffi et al., 2004; Kelsey and Gammon, 1990; Cole et al., 1978; Hutchinson et al., 1980; Titzgibbons et al., 1985; Sarnelli and Squartini, 1987; Bartow et al., 1987; Cook and Rohan, 1985; La Vecchia et al., 1985). In Sudan, a lot of work had been done on malignant breast tumors, for example the report done by Ahmed et al. (2010) for the frequency of breast cancer in Sudan, but to our knowledge this is the first research which concentrates on benign breast tumors in Red Sea State, Sudan. This paper touch the important point which was

not mentioned by any work in this area, which is the frequency of benign breast lesions, since these benign tumors had the liability to change in malignancy. The second lesson, is not to miss the far more common benign lesions in the clinical work in the field of breast oncology with their different histopathological varieties. The third message here is the importance of histopathological examination or FNAC for any breast mass, even if it looks as benign on clinical examination.

The term "benign breast diseases" encompasses a heterogeneous group of lesions that may present a wide range of symptoms or may be detected as incidental microscopic findings. The incidence of benign breast lesions begins to rise during the second decade of life and peaks in the fourth and fifth decades, as opposed to

malignant diseases, for which the incidence continues to increase after menopause, although at a less rapid pace (Kelsey and Gammon, 1990; Cole et al., 1978; Hutchinson et al., 1980; Titzgibbons et al., 1985; Sarnelli and Squartini, 1987; Bartow et al., 1987; Cook and Rohan, 1985; La Vecchia et al., 1985; Donegan, 2002; Shaaban et al., 2002; Morrow, 1992; London et al., 1992; McDivitt et al., 1992).

It is impossible to know whether a breast lump is cancerous without performing imaging examinations and/or a biopsy and/or Fine-needle aspiration cytology (FNAC). FNAC is part of the triple assessment for the diagnosis of breast lesions. It is an established, highly accurate method for diagnosing breast cancer and has given rise to a reduction in the number of excision biopsies for benign breast disease (Mottahedeh et al., 2003).

It is important for pathologists, radiologists, and oncologists to recognize benign lesions, both to distinguish them from in situ and invasive breast cancer and to assess a patient's risk of developing breast cancer, so that the most appropriate treatment modality for each case can be established. This study aimed to classify benign breast diseases according to their frequency in Red Sea State, Sudan and to compare them to the age and sex of the patients.

## METHODS

Six hundred and eighty-nine specimens were examined in the period from December 2005 to October 2010 in a histopathological laboratory in the Red Sea Medical Center, Portsudan, Sudan. The total number of the whole population was (739,300) according to the national census of 2002 with adjusted growth rate (Ageep et al., 2007).

The histopathological laboratory in the Red Sea Medical Center is the only regional laboratory, to which surgical biopsies and fine needle aspiration cytology were sent. This study constitutes two groups of specimens. The first was breast surgical biopsies which were preserved in 10% formalin and sent to the histopathology laboratory. Then, paraffin embedded blocks were formed and different section levels were made. To these sections, only Haematoxylin and Eosin (H & E) staining was done. Slides of the FNAC were stained by Papanicolaou and May-Grunewald Giemsa (MGG) stains. The other group of specimen was FNAC. The patients complaining of breast mass came directly to the medical center and needle aspiration from the breast mass was collected in 6 slides. Two cytological stains were applied, the Papanicolaou and the May-Grunewald Giemsa (MGG) stains. Clinical Data of the patients were collected on predesigned proforma which included the age, sex, behaviour of the lesion (benign or malignant) and the histological/cytological pattern of the tumor. Ethical clearance was taken from the local Ethical Review Committee (ERC). A written consent was also taken individual from each patient participating in this research.

### Statistical analysis

Data were analyzed by using a computer Statistical Package for Social Sciences (SPSS) program version 16. Results are presented as frequency and percentage. For non normally distributed

quantitative variables median and Inter Quartile Ranges (IQR) were used. Chi square test was used to compare categorical variables and Fischer exact test were used when numbers were too small to perform the chi-square testing.

## RESULTS

Five hundred and sixty-seven breast specimens out of the 689 were proved to be benign in nature (Table 1). These comprise 466 surgical biopsies and 101 FNAC. The commonest type of benign breast tumor in Red Sea State was fibrocystic disease of the breast (39.3%), followed by Fibroadenoma (30.2%). Acute mastitis came next - in the order of frequency- to above breast lesions (5.8%). The fourth common benign breast disease was low grade phyllodes tumor (5.7%). Breast abscesses represented the fifth common benign breast diseases (4.1%). The age's peak incidence of benign breast tumors was between 20 to 29 years and then declined (Table 2). On the other hand, malignant tumors most commonly appear at the age between 40 to 49 years. The overwhelming majority of the patients (680 of the cases) were females and nine cases were males. Only one male with malignant breast lesion was seen. The other benign breast lesions in males were gynaecomastia (6 patients) and lipoma (2 patients).

## DISCUSSION

The workup and management of a discrete breast mass are governed by the age of the patient, the histological characteristics of the mass, and the patient's medical history. Two important points about this study are present. First, this is the first work that describes the histological pattern of benign breast tumors in our region. The second important value is that some of the benign breast tumors carry high risk to change in to malignancy, while others have fewer tendencies to become cancerous. Hence, knowledge about what benign breast lesion is common definitely will assist in implementing a potent scientific preventive program against breast cancer in the study area. In Sudan, a lot of work had been done on malignant breast tumors, for example the report done by Ahmed et al. (2010) for the frequency of breast cancer in Sudan, but to our knowledge non of these papers focused on the benign breast lesions.

The low volume of specimens (689) in a large area like Red Sea State in a duration of 5 years is a factor constituting limitation to this study. The reasons may be related to poverty and lack of a potent health insurance system. Sometimes surgical biopsies were discarded without histopathological examination and this reflects ignorance of some rural population and negligence of some doctors. Many doctors were not sucking to the golden rule that says (It is impossible to prove whether a breast lump is benign or cancerous without performing

**Table 1.** Classification of benign breast tumors and their frequency in Res Sea State, Sudan (only 8 case are males).

Type of benign disease	Number of cases	Frequency %
Fibrocystic change	223	39.3
Fibroadenoma	171	30.2
Benign phyllodes	32	5.7
Duct papilloma	06	1.1
Adenosis	04	0.7
Duct ectasia	03	0.5
Fat necrosis	03	0.5
Sclerosing adenosis	12	2.1
Gynaecomastia	06 (males)	1.1
Cysts	13	2.3
Lipoma	02 (males)	0.4
Haemangioma	01	0.1
Atypical hyperplasia	15	2.6
Ectopic reactive lymph node	03	0.5
Tuberculosis	09	1.6
Nipple papilloma	02	0.4
Acute mastitis	33	5.8
Granulomatous mastitis	02	0.4
Abscess	23	4.1
Lactating adenoma	03	0.5
Normal breast tissue	01	0.1
Total	567	100

**Table 2.** Breast lesions according to sex, age and behavior of the tumor.

Age range	Females	Males	Benign lesion	Malignant lesion
< 10	0.3	00	03	00
10-19	142	00	141	01
20-29	260	00	256	04
30-39	118	02	111	09
40-49	59	06	26	39
50-59	44	00	06	38
60-69	32	01	17	16
70-75	12	00	04	08
>75	10	00	03	07
Total	680	09	567	122

imaging examinations and/or a biopsy and/or FNA). Never the less, benign phyllodes tumor on clinical examination is usually difficult to differentiate from fibroadenoma. Hypercellular stroma with cytologic atypia, increased mitoses, and infiltrative margins of the lesion are the most reliable discriminators to separate lesions with recurrence and malignant behavior. In terms of surgical treatment of these tumors, it is important to recognize phyllodes tumor because it should be excised completely with clear margins to obviate any chance of local recurrence. In cases of recurrent disease, mastectomy is often performed (Geisler et al., 2000;

Chen et al., 2005). In our study phyllodes tumor is not uncommon, representing 5.7% of the cases.

The most common benign breast lesion, in this research, was fibrocystic disease of the breast. Over the years, it has been one of the major issues to determine whether these lesions are a risk factor for the subsequent development of breast cancer. Therefore, it is practical to evaluate fibrocystic disease of the breast under a classification system first proposed by Dupont and Page (1987) as non proliferative lesions, proliferative lesions without atypia, and proliferative lesions with atypia (atypical hyperplasia). In various studies, it has been

shown that the great majority of breast biopsies (up to 70%) show non proliferative lesions (Dupont and Page, 1987). Fortunately, in our study non proliferative lesion represents 85% of the fibrocystic diseases. Compared with the general population, women with non proliferative lesions on breast biopsy have no elevation in breast cancer risk, whereas women with proliferative disease without atypia and women with atypical ductal or lobular hyperplasia have a greater breast cancer risk, with relative risks ranging from 1.3 to 1.9 and 3.9 to 13.0, respectively, according to various studies (Dupont and Page, 1987; Dupont et al., 1993; Palli et al., 1991; Marshall et al., 1997). Fibroadenoma was the second common benign breast disease (30.2%). Ihekweba et al. (1994) reported high incidence of fibroadenoma in Western Nigeria, where it was shown to constitute 55.6% of all benign breast lesions (Ihekweba et al., 1994). Perhaps the social habits, diet and environmental differences may account for this disparity.

Apart from the histological features, the age at biopsy and the degree of family history of breast cancer are reported to be the major determinants of breast cancer risk after the diagnosis of benign breast disease (Hartmann et al., 2005). According to Hartmann et al. (2005), the risk for breast cancer in young women with a diagnosis of atypical epithelial proliferation is twice the risk observed among women over 55 years with a diagnosis of atypical epithelial proliferation (Hartmann et al., 2005). In our study, benign breast lesion begins to rise in the second decade of life and peaks in the third decade. Guray and Sahin (2006), in the United States, had reported peak incidence of benign breast tumors in the fourth decade of life. This difference may be related to dietary or environmental factors.

## Conclusion

The benign breast lesions were far common than the malignant breast lesions (ratio 4.6:1). Fibrocystic disease of the breast was the commonest benign breast lesion, followed by fibroadenoma. The age of presentation of benign breast diseases peaks in the third decade of life and then decline. Palpable breast masses should be investigated by cytological (FNAC) or histopathological means. Surgical biopsies should never be discarded without histopathology assessment.

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