

Original Article

The Value of Fine Needle Aspiration Cytology in the Diagnosis of Male Breast Lesions

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ABSTRACT

Objectives: The aim of this retrospective case series is to explore and highlight the subject of male breast diseases in Jeddah, Saudi Arabia and to assess the value of fine needle aspiration in diagnosing these lesions.

Material and Methods: Data on male breast biopsies and fine needle aspiration cytology (FNAC) done between 1984 and 1999 were retrieved from the laboratory records. The same pathologist blindly examined all the cytology and histology slides. Histopathology diagnoses were classified into benign and malignant. FNAC diagnoses were categorized as positive, negative, inconclusive or unsatisfactory. Cytohistologic correlation was done with data from histopathology records. Sensitivity, specificity, and predictive values of FNAC were calculated using standard statistical methods. Our results were also compared with a similar large study.

Results: Sixty-three (6.0%) of 1044 patients undergoing breast surgical biopsies were males. Benign lesions

comprised 55 cases (87.3%), but eight cases (12.7%) were malignant lesions (six ductal carcinomas and two metastatic adenocarcinoma). Gynecomastia is the most common male breast lesion, constituting 54% (mean age 31.23 years). A majority (54%) of these patients presented near puberty. Twelve patients had cytohistological records for correlation, giving a sensitivity of 100%, specificity of 83.33%, positive predictive value of 85.71%, negative predictive value of 100%, false positive fraction of 8.3% and a false negative fraction of 0%.

Conclusion: Male breast lesions constituted 6% of all breast lesions and male breast carcinomas constituted 2.59% of all breast carcinomas. This study also shows that FNAC is an accurate tool for diagnosing male breast lesions. It is highly sensitive and specific. FNAC should, therefore, be used confidently and be included as an integral part of primary assessment of breast lumps in males.

KEYWORDS: aspiration cytology, fine needle aspiration, gynecomastia, male breast lesions

INTRODUCTION

The role of fine needle aspiration cytology (FNAC) in male breast lesions has been reported in literature and is as reliable as in female breasts¹⁻⁷. Indeed, FNAC is the first line investigation in the clinical evaluation of breast lumps in males because it is a fast and cost effective method. It can be performed as an office procedure, requires little special equipment, causes minimal morbidity and has excellent patient acceptance⁸⁻¹².

The scarcity of reports about male breast lesions, especially in Arab males, has been the impetus to this analysis. This led us to analyze 1044 breast biopsies and 446 breast FNAC performed in the Department of Surgical Pathology, King Abdul Aziz University Hospital (KAUH) Jeddah, during a time period of 15 years (from Jan. 1984 to Dec. 1999). Data on male patients with any breast lesions received during this period were reviewed.

The analysis intended to examine the pattern of lesions and the role of FNAC in the diagnosis of male breast lesions. Although our work does not represent the whole picture because of our limited

experience, the intention is to open the way for more detailed studies to explore this scarcely reported but important health issue.

MATERIAL AND METHODS

King Abdul Aziz University Hospital is a 945-bed tertiary care hospital located in Jeddah, Saudi Arabia. To determine the spectrum of male breast lesions, data on all breast biopsies, mastectomies, and FNACs done between 1984 and 1999 were retrieved from the laboratory records. The same pathologist blindly examined all cytology and histology slides. Details concerning sex, age, histopathological diagnosis, cytological diagnosis and frozen section diagnosis were recorded. Histopathology diagnoses were classified into benign and malignant; FNAC diagnoses were categorized as positive, negative, inconclusive or unsatisfactory. Results of cytological findings were compared with the histological diagnosis of each lesion. The relationship of results was analyzed to determine the utility or relative desirability of aspiration cytology. The following

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values concerning the diagnostic accuracy were calculated in our study: (1) Sensitivity, the probability of a positive FNAC result given that the patient has carcinoma; (2) Specificity, the probability of negative FNAC result given that the patient has benign lesion; (3) Positive predictive value, the probability of having carcinoma when the results of FNAC are positive; (4) Negative predictive value, the probability that a tumor is benign when the results of FNAC are negative; (5) False Positive Fraction (FPF), the fraction of all benign lesion reported as positive by FNAC; (6) False Negative Fraction (FNF), the fraction of all carcinomas reported as negative on FNAC; and (7) Accuracy, the proportion of true results (i.e., true positive + true negative) among all results.

RESULTS

Out of a total of 1044 breast cases, 63 (6.0%) were males. All lesions were classified into benign and malignant. As expected, benign lesion comprised the majority (55 cases; 87.3%), but eight cases (12.7%) of malignant lesions were also discovered (six ductal carcinomas and two metastatic adenocarcinoma from widespread metastatic disease from unknown primary) (Table 1).

The most common diagnosis was gynecomastia (34 cases). The mean age of presentation was 33 years. Six cases of lipoma (mean age = 38.5) were found. Six cases of ductal carcinoma (mean age = 55 years) were found. Most of the benign lesions presented at a young age (80% of all benign lesions occurred before the age of 20). Malignant lesions presented late (mean age = 54.8) (Table 1).

A total of 446 consecutive FNAC biopsies were performed at our institute during the 15 years. Of these, 16 FNAC (3.59%) were done on male breasts and only 12 had histological follow-up. These 12 FNAC were reviewed. Six specimens were classified as positive, five as negative, one as suspicious. There were only two FNAC diagnosed as unsatisfactory but as there was no histological follow up, they were not included in this analysis. Of the six lesions diagnosed on FNAC as positive; five were confirmed as malignant and one was histologically diagnosed as gynecomastia. All the negative cases were proven negative. The one suspicious specimen proved to be malignant and is considered as true positive in our analysis. We, therefore, reached the following results: True positive = 6 (50%); False positive = 1 (8.3%); False negative = 0 (0%) and True negative = 5 (41.66%). Assuming that suspicious and positive cytologic findings represented carcinoma of the breast, FNAC detected cancer with a sensitivity of 100%,

Table 1
Age distribution of male breast lesions

Male Breast Lesions	Mean Age	Age in years							Total	%
		9-19	20-29	30-39	40-49	50-59	60-69	70-79		
Fibroadenosis	24.6		2						2	3.2
No malignancy	22.4	2	4						6	9.5
Gynecomastia	31.23	7	11	6	5	2	2	1	34	54
Lipoma	38.3		1	4	2	1			8	12.7
Ductal ca.	58.4					4	2		6	9.5
Cystic lesion.	17.5	3	1						4	6.4
Myofibroblastoma	36			1					1	1.6
Metastatic adenocarcinoma	51.2				1	1			2	3.2
Total		12	19	10	8	8	4	1	63	100%

Table 2
Performance and predictive values of FNADiagnosis

Values	%
Sensitivity	100
Specificity	83.33
Positive predictive value	85.71
Negative predictive value	100
False positive fraction	8.3
False negative fraction	0
Unsatisfactory rate	12.5

Table 3
Comparison of statistical parameters with a larger study

Parameters	Joshi et al ^[12]	Present Study
No. of cases	507	12
Sensitivity (%)	100 (A)	100 (B)
Specificity (%)	100	80.5
Positive predictive value (%)	100	83.7
Negative predictive value (%)	100	100

A = only negative and positive cytology results were utilized for calculations. B = Negative, inconclusive and positive cytological results were utilized for calculations. (Inconclusive results were added to positive cytology.)

specificity of 83.33%, positive predictive value of 85.71%, negative predictive value of 100%, FPF of 8.3% and FNF of 0% (Table 2).

DISCUSSION

Lesions of the male breast, especially carcinomas, are rare compared to those found in the female breast.^[1,6] In our series, we found a 6.0% incidence of male breast lesion. This was a bit higher than that reported in the USA and in south-east Asia (range from 2 - 3%)^[3,7,12-15]. All lesions were classified into benign and malignant. As expected, benign lesion comprised the major fraction (55 cases; 87.3%), but eight cases (12.7%) of malignant lesions were also discovered (six ductal carcinomas and two metastatic adenocarcinoma from wide spread metastatic disease from unknown primary) (Table 1).

Gynecomastia was the most common reported lesion in male breasts, constituting 54% (mean age = 31.23). A majority of the patients presented at puberty (18 out of 34; 53%) and all of the lesions disappeared spontaneously with sexual maturation as none of these patients presented for follow up. Eleven cases (32.35%) of gynecomastia presented in middle age and five cases (14.7%) presented late.

The next most common lesion was lipoma, eight cases (12.7%) with a mean age 38.3. The exact clinical significance of lipoma in this location was not investigated but hormonal effects and obesity could have some effect in the pathogenesis.^[16]

Carcinomas can occur in male breasts. In our study, eight cases (12.7%), six ductal carcinoma and two metastatic adenocarcinoma, were diagnosed. A total of 309 carcinomas were diagnosed at our institute during the 15 years, making male breast carcinomas 2.59%. This value is higher than the <1% reported from United States^[12,16-20], but is lower than reported from other studies in Middle East and Africa^[21-24]. Male breast carcinoma represents 1% of all breast carcinomas in USA, but in countries like Egypt, the incidence raises to nearly 10%^[22,24]. In one report from King Faisal Hospital in Taif KSA, breast carcinomas constituted 8.3%, (8 cases out of total 96 breast carcinomas)^[24]. A similar higher incidence of male breast carcinoma has been reported by Koriech^[23]. Though there are no recognizable etiological reasons and the higher incidence may be related to the higher incidence of liver cirrhosis following hepatitis B, leading to hyperestrogenism and malignancy in susceptible males^[24].

Most of the cases presented in the sixth decade, which is a decade later than the age for female breast carcinoma^[20]. The mean age calculated for ductal carcinoma was 58.4. A study published from the US Virginia Medical School calculated the mean age for ductal carcinoma in males at 64 years and they found that 60% of these patients were obese^[16]. So our males presented a decade earlier than in the United States.

The ductal carcinoma in males is very similar to that in females in terms of epidemiology, natural history, diagnosis, staging and response to therapy^[16-20,25,26].

Our study did not examine details of the cytological features of the male breast carcinomas. In the literature, however, it is reported that cytological findings in male breast cancer are essentially identical to those in the female breast^[27,28]. Different histological types of breast cancer have been reported in men. Ductal carcinoma is by far the most common; lobular carcinoma is particularly rare, but has been reported in Klinefelter's syndrome^[20].

Florid, female-like, epithelial proliferations have been reported in the male breast^[20,29,30]. In our study, four cases (6.35%) of benign cystic lesions and two (3.17%) diagnosed as fibroadenosis were found. The mean ages for both lesions were 37.1 and 24.6, respectively.

Our cytohistological analysis of breast FNAC favored the value of FNAC biopsy as an efficient tool for diagnosing breast lesions. Even with the limited number of available cases, our results were similar to those presented by large studies. A review of the literature also showed only a few studies on the value of male breast FNAC^[3,5,11]. We have compared our values with one large study in Table 3. In our study, a sensitivity of 100%, specificity of 83.33%, positive predictive value of 85.71%, negative predictive value of 100%, FPF of 8.3% and FNF of 0% were calculated.

In summary, this study described the proportions and patterns of male breast lesions, with mention of our experience regarding role of FNAC in diagnosing male breast lesions. Our FNAC results compared favorably with those in the literature. We finally conclude that FNAC is an efficient tool for diagnosing male breast lesions with high sensitivity and specificity and should be used confidently as an investigation of choice for diagnosing male breast lesions.

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