DOI: 10.7860/JCDR/2014/7920.4507

Original Article

Surgery Section

Clinical Examination Allied to Ultrasonography in the Assessment of New Onset Gynaecomastia: An Observational Study

RUVINDER KAUR ATHWAL[1], ROSAMUND DONOVAN[2], MEHBOOB MIRZA[3]

ABSTRACT

Aim: New onset gynaecomastia is a relatively common presentation to breast surgical services. The main aim of clinical and radiological evaluation is to exclude the presence of concurrent breast cancer. There exists much variability in the clinical assessment of male patients presenting with new onset gynaecomastia.

Materials and Methods: In the presented pilot study, all the male patients presenting with new onset gynaecomastia to our department over a period of two years were studied.

Results: Fifty three patients presented with new onset gynaecomastia during the study period. Clinical examination allied with ultrasonography confirmed benign breast disease in 50 patients with only three patient requiring breast biopsy to exclude malignancy. We detail the efficacy of utilising clinical examination in conjunction with ultrasonography to evaluate new onset gynaecomastia.

Conclusion: We show that clinical examination used in conjunction with ultrasonography is both highly sensitive and specific for detecting male breast cancer in patients presenting with new onset gynaecomastia.

Keywords: Breast Cancer, Gynaecomastia, Ultrasound

INTRODUCTION

Gynaecomastia is defined as benign proliferation of male breast glandular tissue [1]. It has peak incidences in neonates, pubertal and elderly males [2]. Patients with gynaecomastia are presented to clinicians with a number of symptoms including unilateral or bilateral breast enlargement/lumps whilst those with breast cancer present with irregular sub-areolar masses [3]. Patients are often concerned about breast cancer being the cause of their symptoms. Breast cancer in men accounts for 0.7% of all breast cancers [4] and 0.17% of all cancers in men [5]. Therefore, although rare, patients presenting with gynaecomastia are often worried about the diagnosis of breast cancer, making this presentation relatively common to out-patient breast clinics. Consequently, the exclusion of concurrent cancer within gynaecomastia is a primary aim for the clinician.

Diagnostic evaluation of patients with gynaecomastia can be costly and can involve numerous radiographic tests including mammography and/or ultrasonography. Indeed, the optimal method for the investigation of gynaecomastia remains controversial with recent studies suggesting that both ultrasonography and mammography are required for the assessment of gynaecomastia [6,7] whilst other authors state that mammography alone is sufficient for assessment.

We evaluated whether our policy of clinical examination allied to ultrasonography is an effective method for the assessment of new onset gynaecomastia.

MATERIALS AND METHODS

Patients

Fifty-three male patients presented to the breast Out-patient services with new onset gynaecomastia from January 2006 to December 2008. All the patients were new referrals to our breast unit and were reviewed in the Out-patient clinic. A complete patient history and full physical examination was performed including abdominal and testicular examination. All the patients were reviewed by a consultant breast surgeon. Patients with diffuse breast enlargement and no discrete mass were clinically categorised in our study to the benign breast disease (BBD) group. Patients with a firm discrete mass were assigned into the clinically suspicious group. Clinical history, radiological imaging, and pathology records were retrospectively reviewed. We obtained the following data from patients medical records: age at presentation, patient history, clinical examination including the presence of a palpable mass or nipple inversion. It is a departmental policy not to perform mammography in patients presenting with new onset gynaecomastia. Patients presenting with pubertal gynaecomastia were excluded from the study.

All sonograms were reviewed by one dedicated consultant breast radiologist with over 20 years of experience. Pseudo-gynaecomastia was defined upon ultrasonography as the presence of excess fat only and the absence of fatty lobules and glandular tissue. True gynaecomastia was defined as ultrasonographic evidence of breast tissue with duct formation and surrounding echogenicity. Ultrasound findings were reported using the BI-RADS classification system. Pulsed Doppler studies were also performed on the patients who had clinical examination consistent with malignancy to assess the increased vascularity within the possible tumour.

Patients were seen in the Out-patient clinic at four weeks and six monthly thereafter if required. These Out-patient reviews were Determined by clinican preference. This study was approved by the hospital review board. Informed consent was obtained from all research participants orally in accordance with departmental and institutional policy.

Ultrasonography

Real-time gray-scale and Colour Doppler sonography were performed by using an IGE unit (Siemens Medical Solutions) with a 7–9-MegaHertz linear array transducer. Gray-scale parameters assessed included presence and type of lesion, shape, margin features,

posterior acoustic phenomena, echogenicity and vascularity, as well as surrounding tissue features such as skin, nipple, or pectoralis muscle involvement and ductal extension. In addition, the sonographic status of regional nodal basins, including the axillary, internal mammary and supra-clavicular regions.

Histology

Pathology was obtained from core biopsy and mastectomy specimens. Axillary nodal status was determined by both sonographically guided fine-needle aspiration biopsy and axillary nodal dissection or sentinel node biopsy. Pathology features were evaluated by one dedicated breast pathologist with over 10 years of experience.

RESULTS

Fifty-three men with a range of breast symptoms were seen in our out patient clinic. Median patient age at presentation was 56-years-old (range 14-86 years). [Table/Fig-1] shows the symptoms and clinical findings of the patients included within the study.

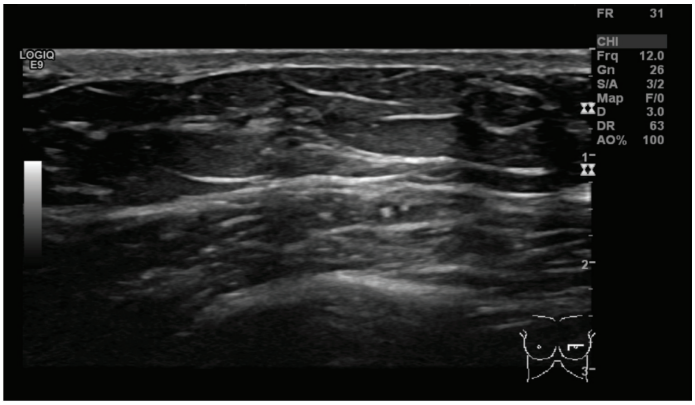
The vast majority of patients presented with unilateral breast symptoms (92 per cent). Of the patients presenting with unilateral symptoms three had a discrete breast lump whilst 38 patients had diffuse breast swelling. Four patients in the study presented with bilateral symptoms. Median time of symptom onset of all patients was two months (range 1-8 months)

Nineteen patients (18 per cent) were taking medication that could have been a potential cause of the gynaecomastia; including finasteride (n=9), ranitidine (n=4), corticosteroids (n=4) and potassium sparing diuretics (n=2). [Table/Fig-1] summarises the findings of clinical examination in all the patients. Following clinical examination three patients (5.6 per cent) were thought to have signs consistent with malignancy. All these patients had presented with a unilateral firm discrete mass. Ultrasonography corroborated these suspicious findings in the two patients by revealing feature consistent with invasive ductal carcinoma [Table/Fig-2]. Both the patients underwent core breast biopsy were found to the have a breast cancer. These two patients underwent mastectomy and axillary node clearance. Histology confirmed grade two invasive ductal carcinoma. These patients remain under review as part of our breast cancer follow-up protocol. In the remaining patients ultrasonography was consistent with BBD [Table/Fig-2], which was confirmed by core biopsy and histology. This patient reported resolution of symptoms on six month out-patient review and was discharged from regular follow-up.

Laterality	Symptom	Clinically Benign	Clinically Suspicious
Unilateral	Lump	-	3
	Swelling	38	-
	Pain	7	-
	Discharge	1	-
Bilateral	Lump	2	-
	Pain	2	-

[Table/Fig-1]: Summary of the symptoms and clinical findings of the patients included within the study.
The table illustrates that the vast majority of patients presented with unilateral breast swelling which were clinically consistent with benign disease. Three patients presented with unilateral discrete lumps within the breast that were clinically felt to be suspicious. Patients with bilateral symptoms were all clinically consistent with benign disease

In the remaining 50 patients clinical examination was consistent with BBD. As is our departmental policy all these patients underwent ultrasonography only. This confirmed BBD in all the 50 patients. As a result, none of these patients were not subjected to breast biopsy. The median follow-up time for all the patients with BBD was two months (range 0-3 months). At eight-week out-patient review 48 of the 50 patients with BBD (91 per cent) were discharged from routine



(A)

(Bi) (Bii) (Biii)

[Table/Fig-2]: The ultrasonographic appearance of gynaecomastia and breast cancer associated with gynaecomastia.
(A) Demonstrates the typical ultrasonographic image of benign gynaecomastia. The sonograms shows the development of some glandular tissue which is consistent with BBD. The dense areas illustrate ducts containing hypoechoic regions consistent with fluid. (Bi-iii) Illustrates the characteristic features of gynaecomastia with the presence of malignancy. A hypoechoic discrete mass with associated posterior acoustic shadowing within the breast tissue is indicative of breast cancer

follow-up. The remaining patients were discharged three months after initial presentation.

Our pilot study shows that clinical examination allied with ultrasonography have excellent sensitivity, specificity and negative predictive value for the exclusion of neoplasia in male patients presenting with new onset gynaecomastia.

DISCUSSION

The radiological assessment of male gynaecomastia remains controversial. The ability to rule out the presence of concomitant breast cancer in gynaecomastia means that the patient can be effectively counselled and can be managed conservatively. We assessed whether our policy of performing ultrasonography on patients with new onset gynaecomastia was an effective use of resources.

Previous studies have suggested the clinical examination is inferior to radiological evaluation of gynaecomastia [2]. However, these studies have not assessed whether clinical examination allied to radiological examination can be a useful tool for assessing gynaecomastia. Patients usually present with bilateral gynaecomastia but patients may present with asymmetrical or unilateral findings [3,8,9]. Previous authors have suggested that mammography is fairly accurate in distinguishing between malignant breast disease and BBD and can substantially reduce the need for biopsies. However, there have been several case reports that have shown that concomitant breast cancer was not detected by mammography alone and that ultrasonography was required to achieve the correct diagnosis. In the light of this, studies that report sensitivity and specificity of mammography for benign and malignant breast conditions exceeding 90% should be treated with caution. Indeed, the positive predictive value of mammography for malignant conditions is low (55%) [10]. We show that ultrasonography can clearly distinguish between BBD and malignant breast disease in new onset gynaecomastia. Furthermore, we show that ultrasonography has a negative predictive value of 100 per cent for malignancy in new onset gynaecomastia. The use of ultrasonography allowed the efficient diagnosis and management of patients with gynaecomastia within an out-patient setting and negated the use of mammography. We also report a low rate of breast biopsy (5%) ensuring only those patients with clinical and

ultrasonographic features that were suspicious required biopsy. Therefore, our pilot study suggested that patients presenting with new onset gynaecomastia should have a thorough history and physical examination and that ultrasonography can be used as the primary imaging modality in this setting to exclude concomitant malignancy.

REFERENCES

[1] Braunstein GD. Gynaecomastia. *N Engl J Med.* 2007; 357:1229.
[2] Johnson RE and Murad MH. Gynaecomastia: Pathphysiology, evaluation and management. *Mayo Clin Proc.* 2009; 84:1010.
[3] Mathew J, Perkins GH, Stephens T. Primary breast cancer in men: clinical imaging, and pathologic findings in 57 patients. 2008; 191:1631.
[4] Giordano SH. A review of the diagnosis and management of male breast cancer. *Oncologist.* 2005; 10:471.
[5] Applebaum AH, Evans GF, Levy KR, et al. Mammographic appearances of male breast disease. *Radio Graphics.* 1999; 19:559.
[6] Munoz Carrasco R, Alvarez Benito M, Munoz, et al. Mammography and ultrasound in the evaluation of male breast disease. *Eur Radiol.* 2010; 20:2797.
[7] Cole-Beuglet C, Schwartz GF and Kurtz AB. Ultrasound mammography for male breast enlargement. *J Ultrasound Med.* 1982; 8:301.
[8] Niewoehner CB and Nuttal FQ. Gynaecomastia in a hospitalized male population. *Am J Med*. 1984; 77:633.
[9] Kumanov P, Deepinder F, Robeva R, et al. Relationship of adolescent gynecomastia with varicocele and somatometric parameters: a cross-sectional study in 6200 healthy boys. *J Adolesc Health.* 2007; 41:126.
[10] Evans GF, Anthony T, Turnage RH, et al. The diagnostic accuracy of mammography in the evaluation of male breast disease. *Am J Surg.* 2001; 181:96.

PARTICULARS OF CONTRIBUTORS:
1. Specialist Registrar in General Surgery, Department of Breast Surgery, Sandwell Hospital, Lyndon, West Midlands, B71 4HJ. United Kingdom.
2. Consultant Radiologist, Department of Breast Surgery, Sandwell Hospital, Lyndon, West Midlands, B71 4HJ. United Kingdom.
3. Consultant General and Breast Surgeon, Department of Breast Surgery, Sandwell Hospital, Lyndon, West Midlands, B71 4HJ. United Kingdom.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Ms. Ruvinder Kaur Athwal,
Sandwell Hospital, Lyndon, West Bromwich, West Midlands, B71 4HJ
Phone: 0121-5331831, E-mail: ruvinderathwal@hotmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Oct 16, 2013**
Date of Peer Review: **Dec 19, 2013**
Date of Acceptance: **Jan 25, 2014**
Date of Publishing: **Jun 20, 2014**