"USEFULNESS OF MAMMOGRAPHY IN THE INVESTIGATION OF SYMPTOMATIC PATIENTS UNDER 30 YEARS OF AGE AT KENYATTA NATIONAL HOSPITAL"

A DISSERTATION SUBMITTED IN PART FULFILLMENT FOR THE DEGREE OF MASTER OF MEDICINE IN DIAGNOSTIC RADIOLOGY IN THE UNIVERSITY OF NAIROBI

SEPTEMBER 1995

BY

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DECLARATION

CANDIDATE: This dissertation is my original work and has not been presented for a degree in any other University.

SIGNED:..

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SUPERVISOR: This dissertation has been submitted for examination with my approval as the University Supervisor.

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SUMMARY:

A total of 131 patients under 30 years of age underwent mammographic examination during the period from January 1992 when the mammography unit at Kenyatta National Hospital started operating, to July 1995. Of these, 20 patients were referred from hospitals outside Kenyatta National Hospital and were therefore excluded from the study.

Of the 111 patients included in the study, 2 (1.8%) were males, both who had been referred for investigation of gynaecomastia, and the rest (98.2%) were females. The commonest complaint that lead to mammographic investigation was lump (34.2%) followed by breast swelling (20.7%), breast pain (17.1%) and breast discharge (10%). The most frequent physical sign was a palpable lump (46.9%), followed by tenderness (15.3%) and breast discharge (13.5%). 12.6% of patients had normal physical examination findings.

58 patients (52.3%) had normal mammograms. Of the abnormal mammograms 2 (1.8%) were suggestive of carcinoma of the breast, and in 2 cases (1.8%), no mammographic diagnosis was made because the breast parenchyma was too dense.

Of the 13 patients who were recommended for ultrasound following mammography, 4 showed a solid mass while the rest did not have the examination. 8 patients recommended for follow up mammography did not have the examination done and 1 patient recommended for ductography showed pooling of contrast in scar tissue. Of the 9 patients recommended for biopsy, only 3 were done which showed fibrocystic mastopathy, fibroadenoma, and cystosarcoma phylloides.

30 patients (27%) had benign biopsy findings, 2 (1.8%) were malignant, 3 (2.7%) were non diagnostic and 1 (0.9%) was non specific (unusual cell combination). Biopsy results for the rest of the patients could not be obtained. Only in 2 cases of fibroadenoma was there correlation between mammographic and, histological diagnosed. Biopsy findings for the two cases thought to have malignant disease mammographically were not available.

90% to 95% of breast cancers are found by the patients themselves, either accidentally or by breast self examination, but mammography is the only method that will detect breast cancer earlier[1]. The value of mammography as an investigative method for young patients has, however, been doubted by some investigators[2,3] since these young patients have dense breast tissue which may obscure pathology in a mammogram, are less likely to develop breast cancer, and are at a higher risk of radiation induced carcinogenesis.

INTRODUCTION

In most developed and many developing countries, breast cancer is the most frequent cancer and the leading cause of cancer death in women[4]. About one of eleven women in these countries will develop breast cancer[1,4]. Currently more than 40% of all breast cancers are found in developing countries, but the incidence pattern is progressively approaching that of developed countries and is predicted to reach more than 50% by the year 2000[4].

In the United States and other western industrialized countries, the incidence of breast cancer increases in the under 35 years age group, with a sharp rise between 35 and 45, a plateau around menopause known as the 'Clemmensen's Hook', and again a sharp rise after menopause[5,6].

In Kenya, breast cancer accounts for 7% of all malignancies and is only second in number to cancer of the cervix[6]. The incidence rate in females is 1.08 per 100,000 person years[6].

The age specific incidence in Kenya and other African countries contrasts with North America and Europe[6]. In Africa, the incidence increases from age 20 years until menopause, a peak at 50 to 60 years and a fall towards old age. Histologically invasive ductal carcinoma accounts for 87% of breast cancer in Kenya, 71% of which is poorly differentiated[6].

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Evidence for mortality reduction by periodic screening was first provided by the HIP (Health Insurance Plan of

Greater New York) study of 1963 to 1969[7] in which women 40 to 60 years old were offered annual screening with mammography and clinical examination and compared with a control group. Within 3.5 to 4 years, there was reduction in mortality in the study group compared with the control group, and by 5 years, the mortality reduction represented about a 30% differential in cumulative mortality.

A Swedish study done in the mid 1970's in the counties of Kopparberg and östergötland utilising one view mammographic screening[8] also showed a 25% reduction in the absolute rate of Stage II or more advanced cancers, and a 31% reduction in mortality from breast cancer by the end of 1984.

Two Dutch case control studies performed on all women over 35 years of age in Nijmegen, and on women aged 50 to 60 years at Utrecht[9] showed a reduction in mortality from breast cancer of 52% and 72% respectively as a result of screening mammography.

HISTORY OF MAMMOGRAPHY[10, 11]

In 1913, Salomon, a German surgeon performed radiographs of 3000 excised breasts and correlated radiographic, gross and microscopic anatomy. Not only was he able to distinguish between highly infiltrating carcinoma from well circumscribed carcinoma, but he was also the first to recognise non palpable breast cancer on a radiograph.

In the United States, Stafford Warren pioneered breast radiography in 1930 when he reported a stereoscopic technique for mammography. He described the appearances of normal breasts and the changes of pregnancy and mastitis and benign and malignant tumours. He also emphasised the importance of viewing images of the right and left breasts side by side.

During the 1930's there were publications on mammography from South America, the United States and Europe, but there was little clinical interest in mammography for breast cancer diagnosis. Microcalcifications were described in the 1950's by Le-Borgne in Uruguay which he said resembled 'fine grains of salt' and occurred in about 30% of breast caners.

By the mid 1950's mammography was refined to the point of being a reliable clinical tool using low kilovoltage X-ray tubes with molybdenum targets and high detail industrial film. Egan in the United States and Gros in Germany popularised the application of mammography to the diagnosis of breast cancer.

Xeromammography was introduced in the 1960's and popularised by Wolfe and Ruzicka. It substantially lowered

the radiation dose to the patient as compared to industrial grade x ray film, and many clinicians found the xerography films easier to understand and evaluate.

Higher resolution, faster speed X-ray films used in combination with intensifying screens was first introduced by Du Pont company in 1970 and improved by both Kodak and Du Pont in 1975 resulting in very high quality mammogram images with very low patient radiation doses. Further improvements on films, magnification techniques, and grids to reduce scattered radiation have been introduced.

In 1973, Breast Cancer Detection Demonstration Project (BCDDP) was implemented. In this project 280,000 women underwent annual screening for breast cancer at 29 locations throughout the United States for five years. This project, organised by the American Cancer Society and the National Cancer Institute, demonstrated that a programme for screening, physical examination, mammography and breast self examination leads to the earlier diagnosis of breast cancer. In the project, over 41% of all the cancers were found only with mammography, and an even greater proportion of early breast cancers were found only with mammography.

There were fears in the late 1970's of radiation induced carcinoma following mammography, but recent improvements in equipment and technique have demonstrated that the benefits of mammography far outweigh the risks. The future of mammography includes working towards universal screening for all women, training of an adequate number of personnel, and

further defining mammographically discovered lesion that require biopsy and those that do not.

MAMMOGRAPHIC EQUIPMENT

Mammography should only be performed using dedicated units in dedicated rooms with specially trained staff[12]. The units should have the following features[13]:

(i) Three phase or constant potential generators for better quality mammograms and longer tube life compared with single phase generators.

(ii) Control of tube voltage of increments of 1 kVp for screen film mammography and 2 kVp for xeromammography.

(iii) Tube loading limitations should allow adequate mA and mAs output. A unit with lower mA output may require longer exposure times resulting in motion unsharpness and higher radiation dose.

(iv) Phototimers to reduce examination time, facilitate proper exposure and reduce radiation dose.

(v) A molybdenum target, beryllium window tube with 0.03mm molybdenum added filtration for screen film mammography, and a tungsten target with 1 to 2mm added aluminum filtration for xeromammography.

(vi) Effective focal spot size of 0.2 to 0.5mm.

(vii) A C-Arm assembly capable of being locked at multiple positions within a 180 degree rotation.

(viii) Compression devices made of plastic 1 to 4mm thick which should be completely parallel to the film surface during the examination.

(ix) Heat dissipation capability should be adequate to accommodate the anticipated work load.

(x) Specially designed stationary or moving grids to reduce scattered radiation and increase contrast.

(xi) Magnification capability of up to 1.5 times. This may require focal spots smaller than 0.2mm.

Mammography units with rhodium anode and rhodium filtration are also available[14] which may produce mammograms better than those obtained with molybdenum units for young women and women with large, dense breasts.

MAMMOGRAPHIC FEATURES OF MALIGNANCY [15,16]

These can be divided into direct (conventional) signs and indirect (special) signs.

3.1 DIRECT SIGNS

(i) Poorly Defined Mass

The classic carcinoma has a central mass surrounded by a sunburst pattern of radiating, thin spicules.

(ii) Clustered Calcifications

These are the single, most common sign of early breast carcinoma and may be the only sign. They vary in size from 100 to 300 μ but may be as large as 2mm. They are punctate or rod like and are usually 'countless' in number but when more than ten calcifications are clustered together chances of malignancy are high. A cluster of calcifications over an area 1cm or less is the most suggestive finding.

3.2 INDIRECT SIGNS

(i) Single Dilated Duct

This is a very unspecific sign which accounts for 1% of non-palpable breast cancers. Follow up is advised unless a mass or another sign e.g calcification is present.

(ii) Architectural Distortion

This refers to linear markings that radiate from a central region seen usually in dense breasts where the mass itself may be obscured. This sign accounts for 9% of non-palpable breast cancers, and biopsy is therefore advised.

(iii) Asymmetric Density

This is only appreciated by comparing mirror images of the two breasts. An asymmetric density is usually not biopsied because it accounts for less than 3% of breast cancers.

(iv) Developing Density (Neo Density)

Any developing density (seen in follow up films during screening) is abnormal except in pregnancy and lactation, and exogenous hormonal treatment. A neo density should be biopsied because it accounts for 6% of non-palpable breast cancers.

BREAST PARENCHYMAL PATTERNS

The mammographic appearance of breast parenchyma has been advanced as an indicator for the risk of a carcinoma developing. Four patterns have been described[17]:

N1: The breast is composed primarily of fat, often with a trabeculated appearance.

P1: Prominent ducts occupy one fourth or less of the volume of the breast.

P2: Prominent ducts occupy more than one fourth of the volume of the breast.

DY: Mammary dysplasia is severe.

The risk, relative to N1 pattern has been described as being lowest for P1 and highest for DY[17]. However, other studies have failed to show conclusively a definite

association of the risk of breast cancer with these patterns[7,18] .

MAMMOGRAPHY AND PATIENT AGE

Evidence for the usefulness of mammography in screening women for breast cancer varies with age [19]. For women aged 50 to 70 years, the evidence is strong. It is less clear for women in their 40s, and for women below 40 years of age, the low incidence of breast cancer and the low sensitivity of mammography have led to a consensus that routine screening with mammography is not indicated.

A broad consensus of American medical organisations has endorsed the following guidelines for screening mammography [20]:

(a) Onset or baseline mammography by age 40

(b) At 1 to 2 year intervals age 40 to 49 and

(c) Annually thereafter.

Mammography has been shown to be of value in young patients prior to biopsy[21], and in screening young patients at high risk for breast cancer or in confirming and suggesting prompt biopsy of suspicious lesions[22]. However, other investigators have failed to show significant benefit of mammography in women under 30 years of age [3], while others have suggested that mammography may have adverse effects when negative findings delay
biopsy of carcinoma in young patients[23].

It is recommended that women under 30 years of age who have a focal suspicious abnormality should first be

investigated with ultrasound. If the ultrasound is negative and the patient is over 20, a single oblique view of the affected breast is performed to asses for suspicious microcalcifications, which are not visualized by ultrasound. Women below 20 years of age should not undergo mammography[24].

DUCTOGRAPHY OF THE BREAST [25]

The primary indication for breast ductography is spontaneous, unilateral, single-duct nipple discharge. The duct is identified by compressing a 'trigger point' which produces the discharge. It is then cannulated using a 30G straight needle and undiluted, water soluble contrast medium (e.g. Conray 60) is injected. Cranialcaudal and 90 degrees lateral sub-areolar magnification mammography views are then taken.

Relative contraindications to ductography include breast abscess or diffuse mastitis. Pseudolesions are ductal wall irregularities or filling defects of unknown origin, which are not reproducible on pre-operative ductography.

Normal ducts are few and very fine at birth. They increase in number and length during puberty but remain of fine calibre. During lactation, they increase in calibre, and following menopause there is progressive atrophy though the ducts persist without significant reduction in diameter.

Solitary papillomas appear as intraductal filling defects which may cause obstruction. In fibrocystic change, cystically dilated lobules opacify following contrast injection, and communicating ducts are usually normal. Ductal

hyperplasia is characterised by ductal wall irregularity, while in duct ectasia the ducts are dilated and appear pruned.

Ductographic findings of carcinoma include ductal obstruction often with a mass at the point of obstruction, filling defects, ductal wall irregularity, periductal contrast extravasation and displacement of ducts.

RADIATION RISK DUE TO MAMMOGRAPHY

According to the World Health Organisation Commission on Technology Assessment[12], the risk of screening mammography with modern equipment for women 40 years old or older is negligible. Studies involving Japanese data and fluoroscopic studies[7] also indicate that women who are 40 years old at exposure to mammography are at little or no excess risk compared with the general population. Other sources have equated the radiation risk in mammography to the daily average exposure[26]. In Manitoba Canada[27] a study showed the calculated risk associated with screen film mammography to be lower than most diagnostic radiographic procedures.

On the whole, the risk of mammography has been equated with the risk of smoking several cigarettes, driving 60 miles in a car, or being a 60 year old man for ten minutes[11].

BREAST SONOGRAPHY[28]

The breast was one of the first organs to be examined with ultrasound and the potential use of ultrasound for screening for breast cancer was emphasised in the late 1970s

owing to concern over the possibility of radiation induced breast cancer. Ultrasound is not useful for screening because:

(i) It does not depict microcalcifications

(ii) It does not differentiate benign from malignant solid masses

(iii) There is unreliable depiction of solid masses smaller than 1cm

Ultrasound has been recommended as the primary imaging technique for women younger than 30 years with breast problems. Mammography is done only when ultrasound fails to show a simple cyst at the site of a palpable abnormality. An oblique view of one breast is usually done first.

The primary role of sonography today is in the cyst versus solid differentiation of palpable and mammographically detected masses. Ultrasound has a reported accuracy of 98 to 100% in the diagnosis of a simple cyst. A simple cyst needs no further work-up.

There are two types of breast sonographic equipment:
(i) Automated units which produce whole breast images
(ii) Hand held units
For both types, high frequency transducers should be used.

The role of ultrasound in breast imaging may eventually increase with improvements in equipment.

THE MALE BREAST

The most common indication for male breast imaging is a palpable asymmetric thickening or mass. Gynaecomastia is

usually the cause. The normal male breast appears on a mammography as subcutaneous fat without glandular tissue[24] Plate 6.

STATEMENT OF THE PROBLEM

Increased awareness of breast cancer has led many clinicians to request more imaging studies in young women. Breast imaging cannot replace careful clinical evaluation of the breasts. If there is no suspicious focal abnormality imaging studies will not be helpful; they may subject the patient to unnecessary risk[24].

AIMS AND OBJECTIVES

1. TO determine the number of mammograms performed on patients under 30 years old that show pathology and the nature of pathology seen (i.e benign or malignant).

2. To determine the proportion of patients in this age group that has a second imaging procedure recommended by the mammography report.

3. To determine the proportion of patients in this age group that has a histological or cytological investigation recommended by the mammography report.

4. To determine the proportion of patients that has lesions detected following the second imaging procedure, and the characterisation of such lesions as benign or malignant.

5. To determine the proportion of patients recommended for cytological or histological investigation following the second imaging procedure.

6. To establish the yield of malignancy in patients in this age group undergoing histological or cytological investigation following mammography.

MATERIALS AND METHODS

The study was performed at the Kenyatta National Hospital Radiology Department and the Medical Records Department. Mammograms performed on patients less than 30 years old from January 1992 to July 1995 were reviewed both retrospectively and prospectively for abnormalities as reported by the radiologist e.g. the presence of a dominant mass, asymmetry and calcification. If further work up was suggested, this was noted and the results of these further investigations e.g. breast sonography, ductography and biopsy, were recorded from the clinical records. The reason for referral for mammography e.g palpable mass, nipple discharge or family history of breast cancer, was also recorded. The patients age and sex was also noted and all this information was recorded on the proforma (Appendix 2).

All the mammograms were done at Kenyatta National Hospital using Philips Mammo Diagnost UC mammography equipment (Plate 1) unit which has all the features of a dedicated, state-of-the-art unit. Two screen film mammograms were routinely obtained for each breast in the craniocaudal and 45 degrees mediolateral oblique projections by a specially trained radiographer. An axillary view was also taken where necessary. The films were all interpreted by a competent radiologist.

DATA MANAGEMENT AND ANALYSIS

The data was entered into an IBM compatible computer using *spss/de* a data entry program. The analysis of data was done using *SPSS* (statistical package for the social sciences). Analysis included frequencies distribution tables and means ,percentages and cross-tabulation. The final write up was done using *wordperfect version 5.1*, a word processing package.
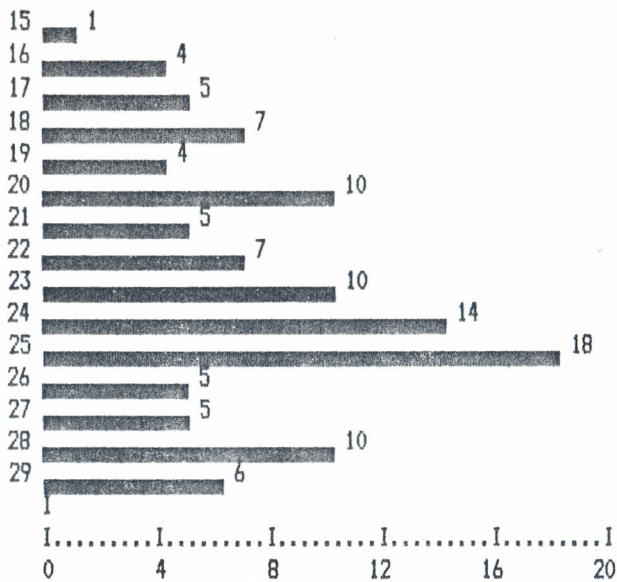
Patients referred for mammography from other hospitals were excluded from the study as their clinical records were not available

RESULTS

TABLE 1: FREQUENCY OF AGE

Age	Frequency	Percent	Valid Percent	Cum Percent
15	1	.9	.9	.9
16	4	3.6	3.6	4.5
17	5	4.5	4.5	9.0
18	7	6.3	6.3	15.3
19	4	3.6	3.6	18.9
20	10	9.0	9.0	27.9
21	5	4.5	4.5	32.4
22	7	6.3	6.3	38.7
23	10	9.0	9.0	47.7
24	14	12.6	12.6	60.4
25	18	16.2	16.2	76.6
26	5	4.5	4.5	81.1
27	5	4.5	4.5	85.6
28	10	9.0	9.0	94.6
29	6	5.4	5.4	100.0
TOTAL	111	100.0	100.0	

AGE

```
15  ▬ 1
16  ▬▬▬ 4
17  ▬▬▬▬ 5
18  ▬▬▬▬▬▬ 7
19  ▬▬▬ 4
20  ▬▬▬▬▬▬▬▬▬ 10
21  ▬▬▬▬ 5
22  ▬▬▬▬▬▬ 7
23  ▬▬▬▬▬▬▬▬▬ 10
24  ▬▬▬▬▬▬▬▬▬▬▬▬ 14
25  ▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬ 18
26  ▬▬▬▬ 5
27  ▬▬▬▬ 5
28  ▬▬▬▬▬▬▬▬▬ 10
29  ▬▬▬▬▬ 6
    I........I........I........I........I........I........I
    0        4        8        12       16       20
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AGE

Mean	23.063	Std Dev	3.659	Minimum	15.000
Maximum	29.000				

TABLE 2: FREQUENCY OF SEX

		Frequency	Percent	Valid Percent	Cum Percent
Female		109	98.2	98.2	98.2
Male		2	1.8	1.8	100.0
	TOTAL	111	100.0	100.0	

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Female ████████████████████████ 109
  Male ██ 2
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       I.........I.........I.........I.........I.........I
       0        40        80       120       160       200
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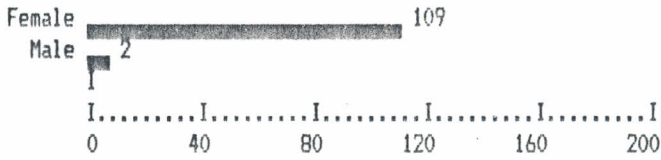
TABLE 3: REFERRAL CLINIC

CLINIC		Frequency	Percent	Valid Percent	Cum Percent
S.O.P.C.		82	73.9	73.9	73.9
Radiotherapy		5	4.5	4.5	78.4
Casualty		17	15.3	15.3	93.7
F.P.Clinic		3	2.7	2.7	96.4
M.O.P.C.		3	2.7	2.7	99.1
Staff clinic		1	.9	.9	100.0
	TOTAL	111	100.0	100.0	

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                CLINIC

      S.O.P.C. ███████████████████████████ 82
  Radiotherapy ██ 5
      Casualty ████ 17
    F.P.Clinic ██ 3
      M.O.P.C. ██ 3
  Staff clinic █ 1
               I
               I.........I.........I.........I.........I.........I
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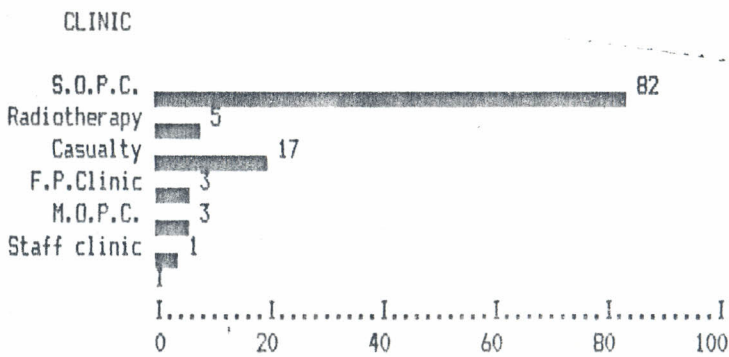
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        M.O.P.C. - MEDICAL OUTPATIENT CLINIC
        F.P. CLINIC - FAMILY PLANNING CLINIC

TABLE 4: FREQUENCY OF SYMPTOMS

SYMPTOM	NO. OF PATIENTS	PERCENTAGE
Lump	38	34.2
Breast swelling	23	20.7
Breast pain	19	17.1
Breast discharge	11	9.9
Check up after surgery	8	7.2
Painful lump	3	2.7
Miscellaneous	9	8.1

TABLE 5: FREQUENCY OF PHYSICAL SIGNS

SIGN	Frequency	Percent	Valid Percent	Cum Percent
None	14	12.6	12.6	12.6
Tenderness	17	15.3	15.3	27.9
Lump(s)	50	45.0	45.0	73.0
Discharge	15	13.5	13.5	86.5
Painful lump(s)	2	1.8	1.8	88.3
Lymphadenopathy	2	1.8	1.8	90.1
Asymmetry	4	3.6	3.6	93.7
Engorged breast + ulcer	1	.9	.9	94.6
Skin changes	4	3.6	3.6	98.2
Gynaecomastia	2	1.8	1.8	100.0
TOTAL	111	100.0	100.0	

```
          None  ████████ 14
    Tenderness  ██████████ 17
       Lump(s)  ████████████████████████████████ 50
     Discharge  █████████ 15
Painful lump(s) ██ 2
Lymphadenopathy ██ 2
     Asymmetry  ███ 4
Engorged breast + ul █ 1
  Skin changes  ███ 4
 Gynaecomastia  ██ 2

          I........I........I........I........I........I
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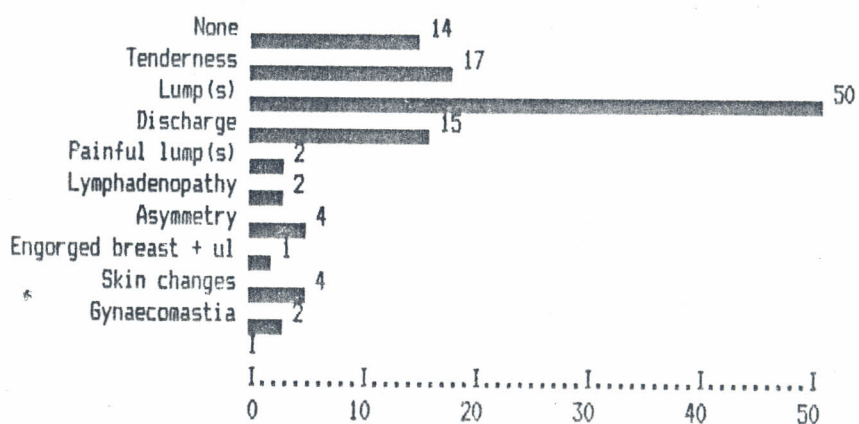
TABLE 6: FREQUENCY OF MAMMOGRAPHIC SIGNS

MAMMOGRAPHIC SIGN	NO. OF PATIENTS	PERCENTAGE
Normal	49	44.2
Well defined mass	29	26.1
Dense parenchyma	8	7.2
Dense parenchyma + a well defined mass	3	2.7
Lymphadenopathy	3	2.7
Dense parenchyma limiting accurate diagnosis	2	1.8
Miscellaneous	17	15.3

TABLE 7: FREQUENCY OF MAMMOGRAPHIC DIAGNOSIS

MAMMOGRAPHIC DIAGNOSIS	NO. OF PATIENTS	PERCENTAGE
Normal	59	53.2
Benign disease (not specified)	22	19.8
Fibroadenoma	16	14.4
Simple cyst	4	3.6
Infection	2	1.8
Carcinoma of the breast	2	1.8
None	2	1.8
Fibrocystic mastopathy	1	0.9
Hydatid cyst or lymphoma	1	0.9
Milk cyst	1	0.9
Lipid cyst	1	0.9

TABLE 8: HISTOLOGIC DIAGNOSIS (NON SPECIFIC)

HISTOLOGIC DIAGNOSIS	NO. OF PATIENTS	PERCENTAGE
Not known	20	18.0
Not done	36	32.5
Benign	30	27.0
Not available	19	17.1
Non diagnostic	3	2.7
Malignant	2	1.8
Non specific	1	0.9

TABLE 9: HISTOLOGIC SPECIFIC DIAGNOSIS
(TOTAL OF 33 PATIENTS)

| DIAGNOSIS	NO. OF PATIENTS	PERCENTAGE
Fibroadenoma	13	39.5
Inflammatory reaction	3	9.1
Duct ectasia	3	9.1
Non specific	3	9.1
Fibrocystic mastopathy	2	6.1
Cystosarcoma phylloides	2	6.1
Mastitis in pregnancy	1	3.0
Lactating fibroadenoma	1	3.0
Intraductal papilloma	1	3.0
Breast abscess	1	3.0
Fibroadenoma in pregnancy	1	3.0
Keloid	1	3.0
Fibrosis	1	3.0

GRAPHS

Age and Sex
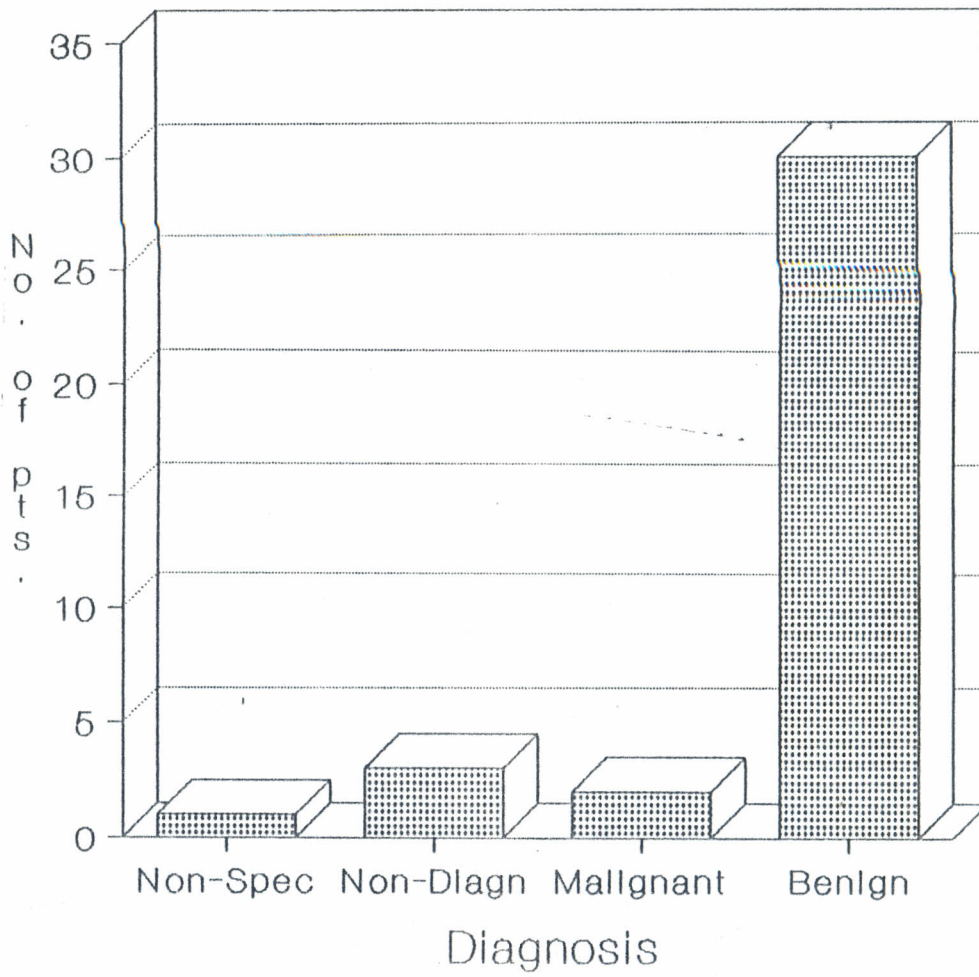# Distribution
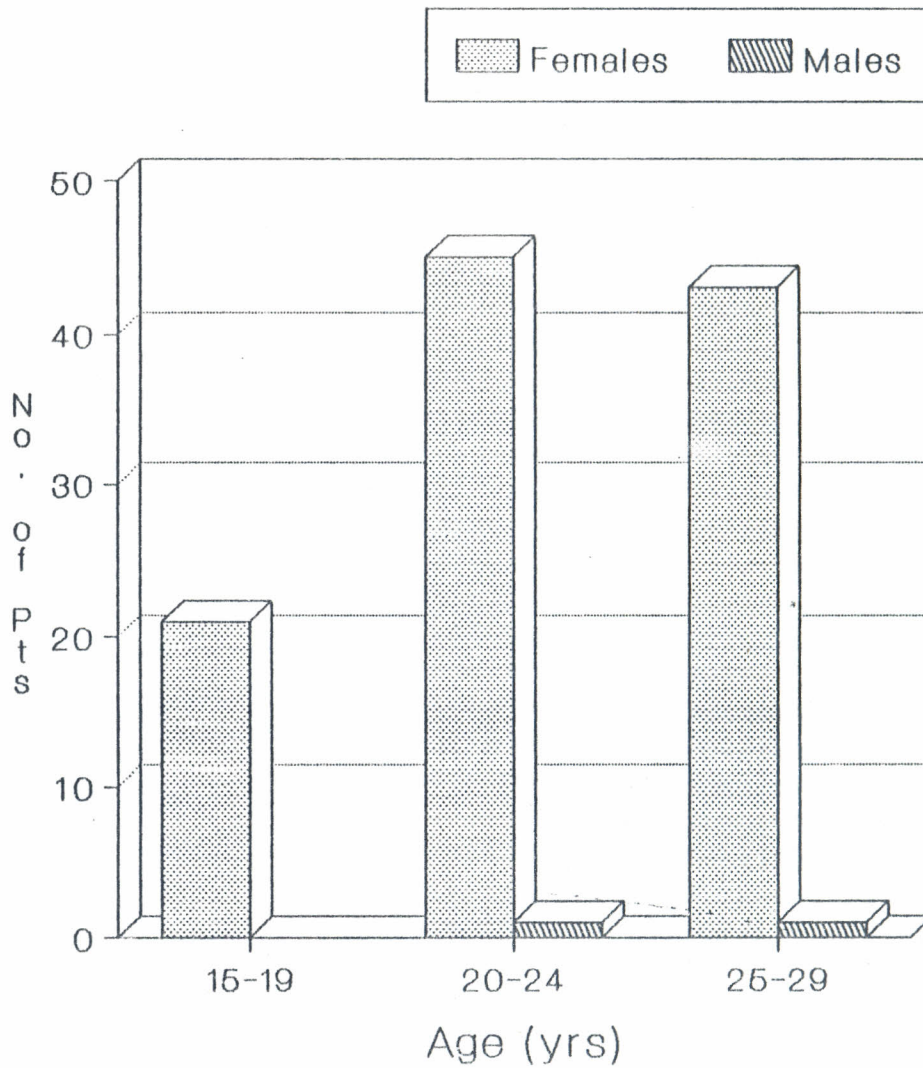
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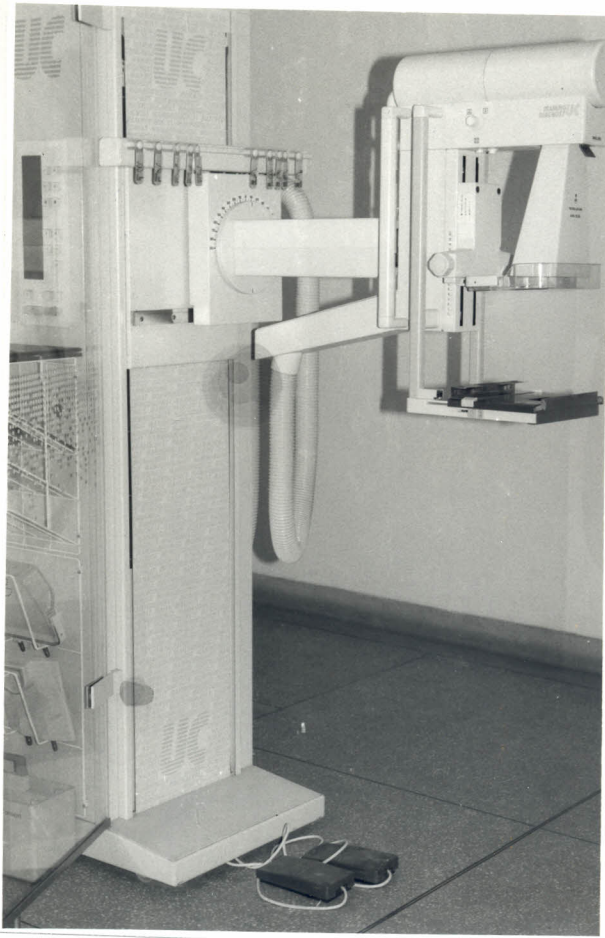# Mammographic Diagnosis
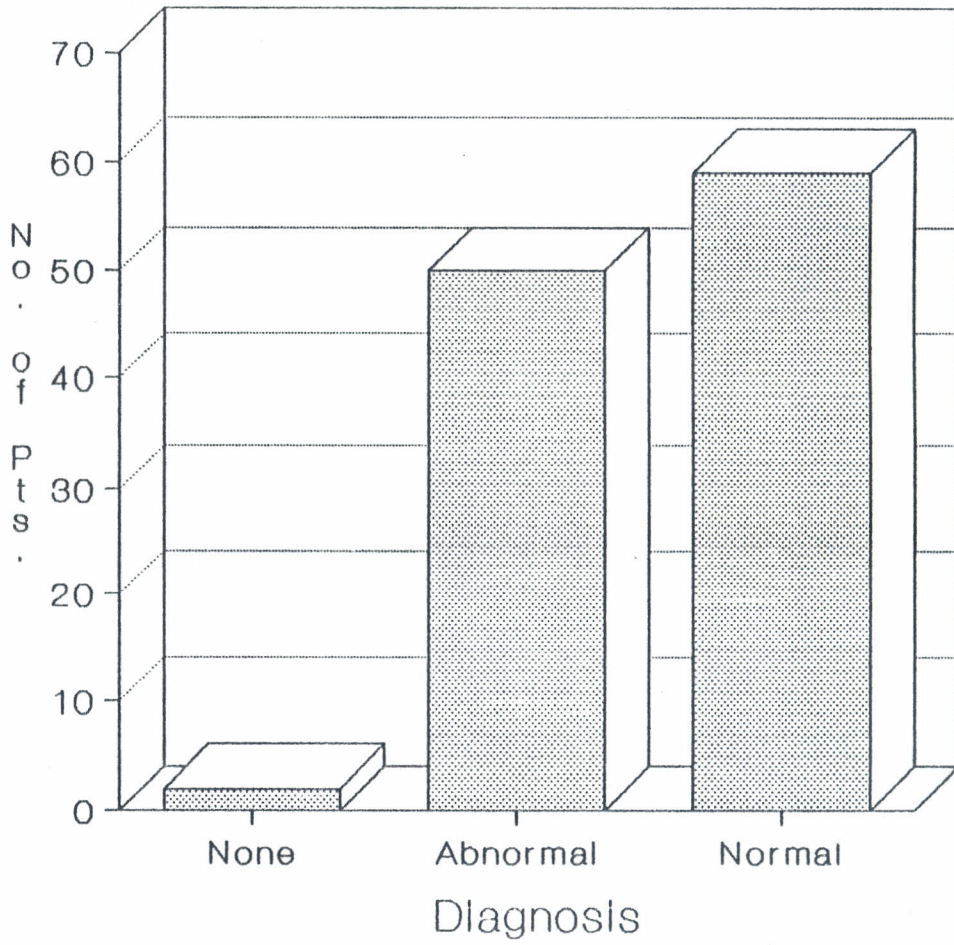
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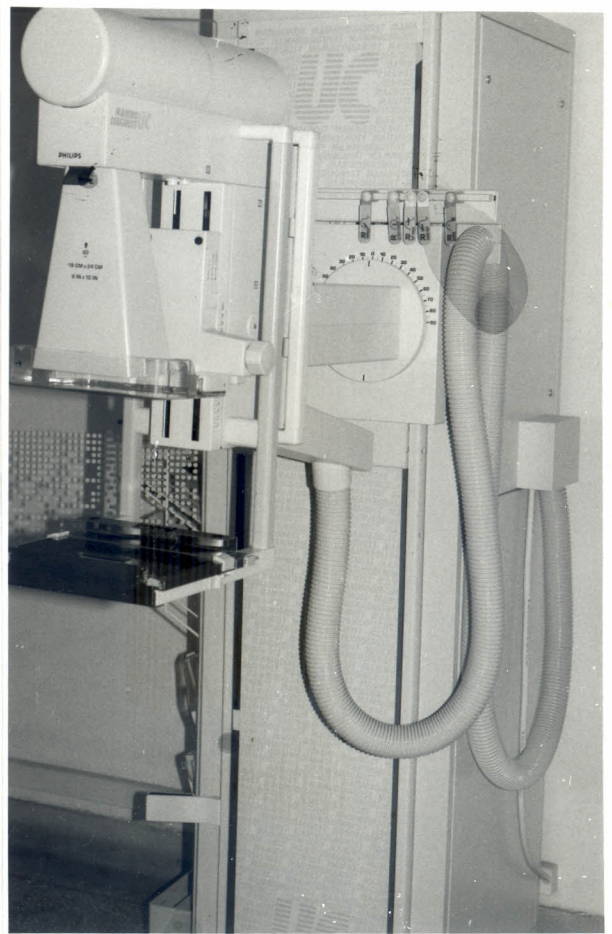
Histologic
Diagnosis

Graph 3

PLATES

PLATE 1: PHILIPS MAMMO DIGNOST UC MAMMOGRAPHIC, EQUIPMENT
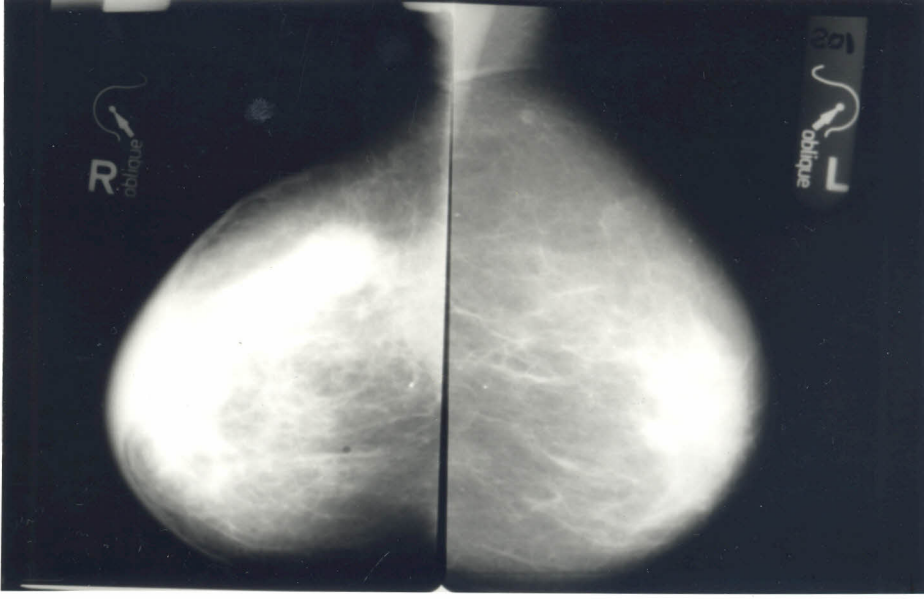

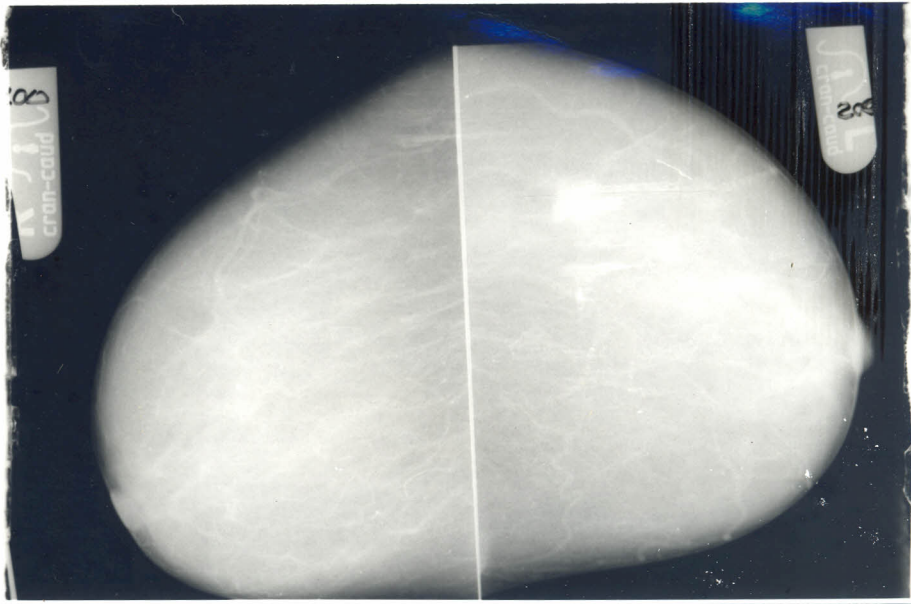a) Showing foot compression devices

b) X – Ray tube and cassette holder

PLATE 2:   TYPICAL APPEARANCE OF BREAST CARCINOMA
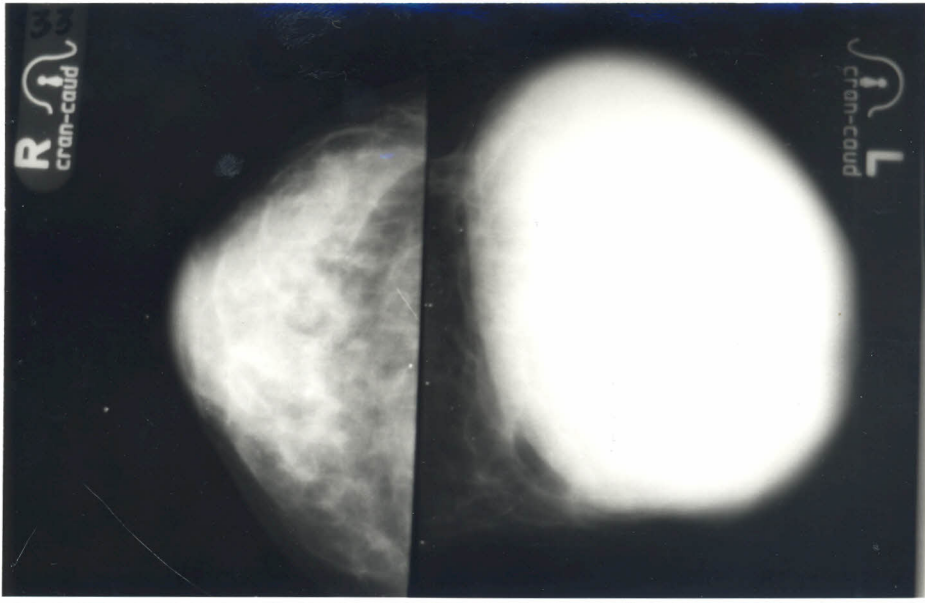
(BOTH AGED OVER 50 YEARS)

a) Spiculated mass

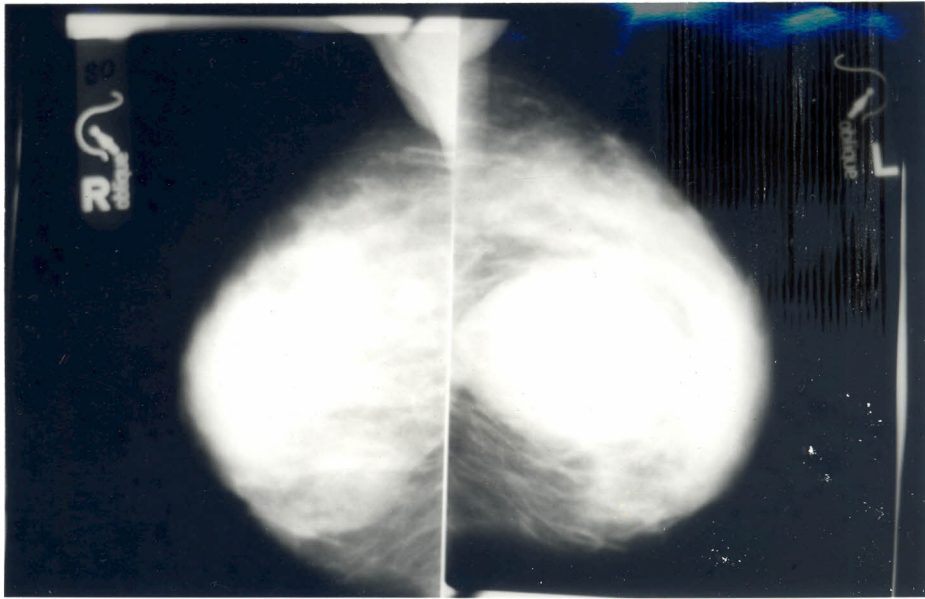b) Spiculated mass with linear microcalcifications

PLATE 3: LARGE SOLID BREAST MASSES

a)   Large solid mass occupying whole of left breast in a 19 year old woman. Ultrasound showed solid

mass, biopsy report not available. Diagnosis - Giant fibroadenoma.

b)   Well defined mass with halo sign in a 19 year old. Mammographic diagnosis - hydatid cyst or

lymphoma. Histological diagnosis - fibroadenoma.

PLATE 4:

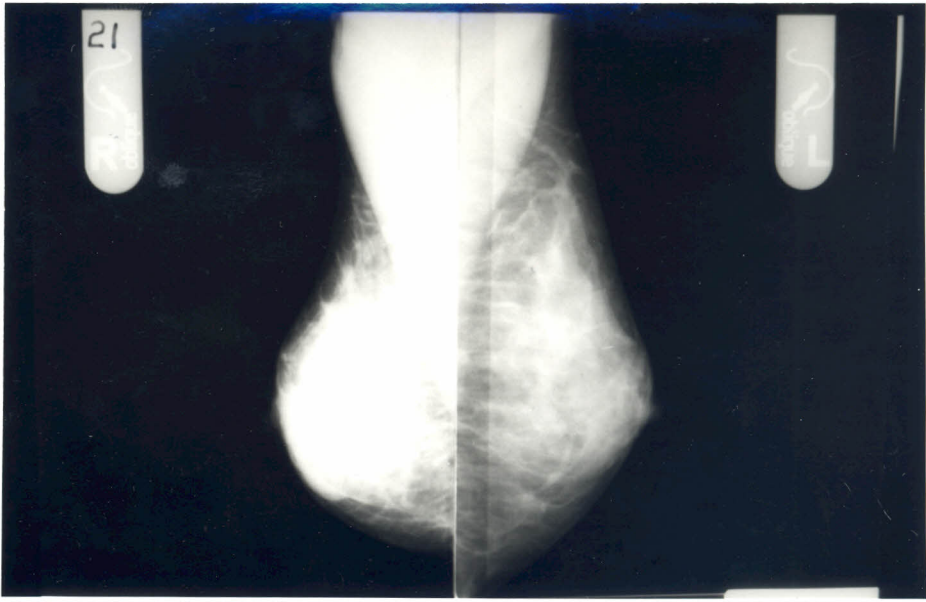A well defined radiolucent lesion with rim calcification in right breast of a 25 year old woman who had previously been operated for fibroadenoma. Diagnosis – lipid cyst. These are usually post traumatic.
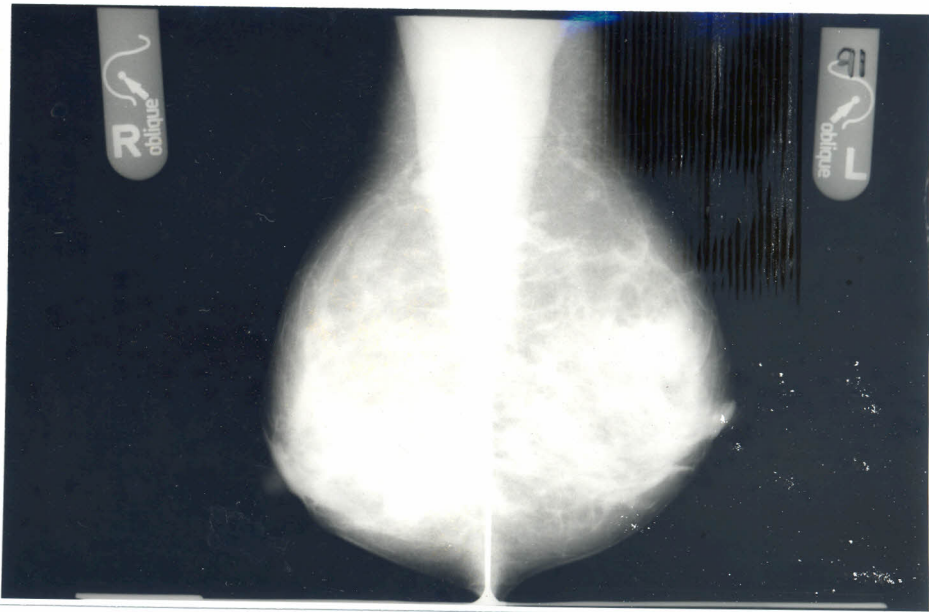

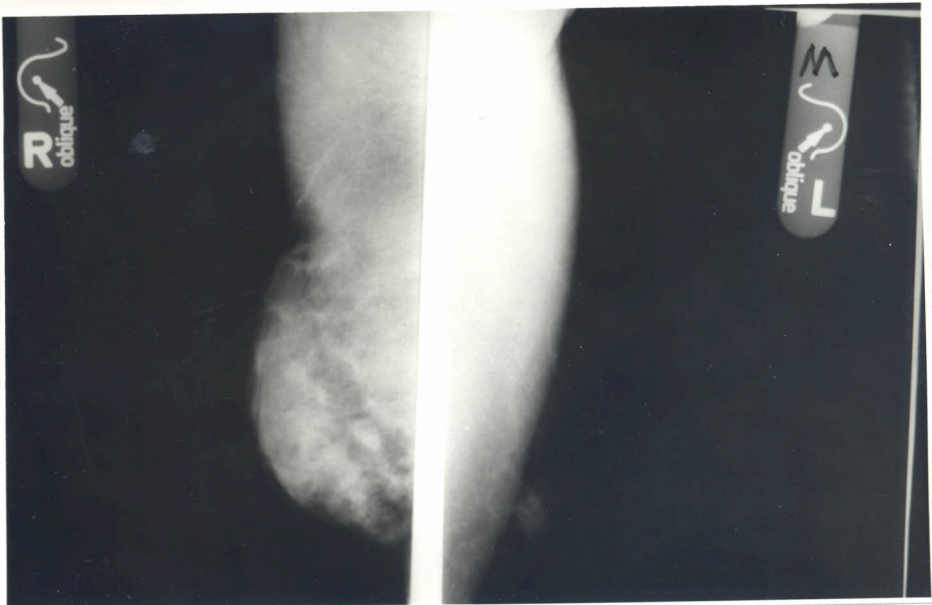PLATE 5

Right axillary lymph node in a 25 year old woman.

PLATE 6

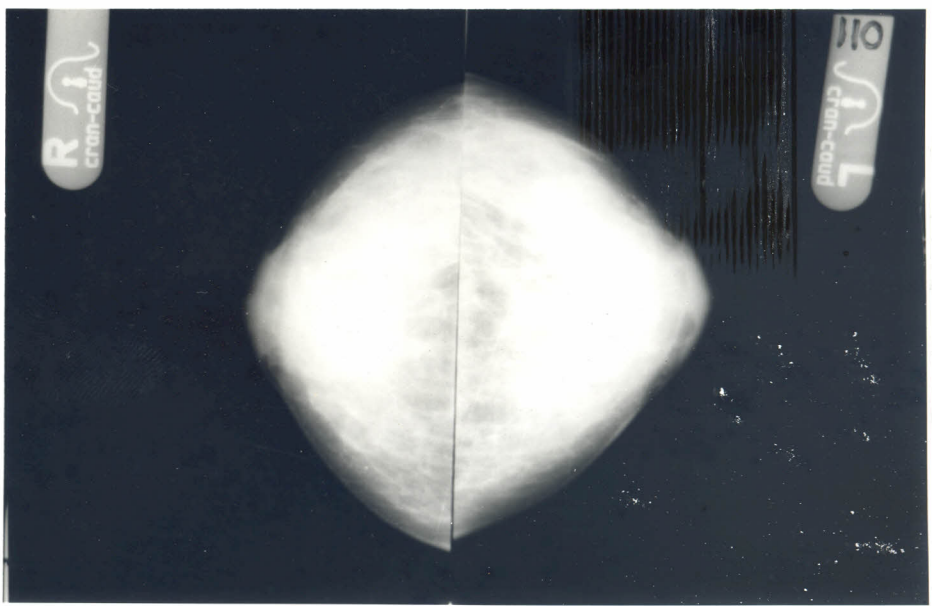Male breast. Right sided gynaecomastia, normal left breast.

PLATE 7

Dense breast parenchyma but normal for age (23 years old).

DISCUSSION

AGE AND SEX DISTRIBUTION AND POINT OF REFERRAL

Of the patients whose age could be verified, a total of 131 patients below the age of 30 years had mammograms performed on them between January 1992 and July 1995. Out of these, 20 patients were referred from hospitals outside Kenyatta National Hospital and were therefore excluded from the study. Two patients (1.8%) were males, both who had been referred for the investigation of gynaecomastia (Table 2).

The age of the patients raged from 15 years to 29 years, with a mean age of 23.1 years (Table 1). 82 patients 73.9%) were referred from the Surgical Out-patient Clinic, 17 (15.3%) from Casualty department, 5 (4.5%) from the Radiotherapy Clinic, and 3 patients each (2.7%) from the Medical Out-patient and Family Planning Clinics. One patient (0.9%) was referred from the Staff Clinic (Table 3).

15 patients were below the age of 20 years. Ideally, these should not have undergone mammographic examination according to the recommendations stated in the literature review. The two males had not been investigated for other causes of gynaecomastia, and there was no follow up for patients referred from the casualty department and the family planing clinic.

CLINICAL SIGNS AND SYMPTOMS

The most frequent symptom that led to mammographic examination was breast lump (38 patients, 34.2%), followed by breast swelling (23 patients, 20.7%), breast pain (19 patients, 17.1%), recurrent symptoms following surgical removal of a lump (8 patients, 7.2%), an unspecified breast discharge (6 patients, 5.4%), bloody discharge (5 patients, 4.5%), and a painful breast lump (3 patients, 2.7%). A total of 11 patients (9.9%) had breast discharge alone. Under the miscellaneous group were breast pain and discharge, breast swelling and family history of breast cancer, breast swelling and discharge, breast swelling and ulceration and generalised lymphadenopathy involving the axilla, each with one case. Two patients were referred with skin excoriation and a clinical diagnosis of ? paget's disease of the breast, and one patient had a clinical diagnosis of simple hypertrophy (Table 4).

The most frequent physical examination finding was a lump or lumps, 50 (45%) of which were non tender and 2 were tender. 17 (15.3%) patients had breast tenderness alone, 15 (13.5%) had discharge alone, and 14 (12.6%) patients had normal physical examination findings. Physical examination findings listed under miscellaneous are lymphadenopathy, breast asymmetry, engorged breast with ulceration, skin changes and gynaecomastia (Table 5).

The patients with palpable lumps clinically would have benefitted from ultrasound prior to mammographic examination.

Patients with breast discharge may have benefitted from ductography.

MAMMOGRAPHIC FINDINGS

According to tables 6 and 7, 44.2% had normal mammographic signs, 26.1% had a well defined mass, 7.2% had dense parenchyma radiographically but were interpreted as normal and 2.7% had dense parenchyma and a well defined mass. 2 patients (1.8%) had dense parenchyma limiting accuracy of diagnosis and therefore no mammographic conclusion was made. Two patients with parenchymal scars mammographically have also been grouped with those with a normal mammographic diagnosis.

59 patients (53.3%) had a normal mammographic diagnosis, 22 (19.8%) had non specified benign disease and 16 (14.4%) had a diagnosis of fibroadenoma. 2 patients (1.8%) had mammographic features of malignancy. These were however not confirmed histologically since their clinical records were not available. One patient with a mammographic diagnosis of lipid cyst had undergone surgery previously for removal of a fibroadenoma.

Of the 13 patients recommended for ultrasound, 4 showed a solid mass while 9 were not done. One patient had ductography recommended, which was reported as showing pooling of contrast in scar tissue. 5 patients were recommended for follow up mammography, but none had it done. Biopsy was recommended for 8 patients, but only 2 had it done, one which showed fibroadenoma and the other one

cystosarcoma phylloides. One patient had a second mammography, though she had been recommended for ultrasound which was not done. Those investigations that were not done as recommended were not requested for by the clinician.

Only two patients (1.8%) had mammographic features of malignancy in this study, which were not proven histologically. There was therefore no histologically proven yield of malignancy in this study. Management did not depend on mammographic findings or recommendations.

HISTOLOGICAL FINDINGS

Of the 111 patients in this study, 36 (32.5%) had no biopsy done, 19 (17.1%) were done but the results were not available in their clinical records, and 20 patients (18.0%) had their clinical records missing and therefore their histological diagnoses were not known. 30 cases (27.0%) were benign, 3 (2.7%) were non diagnostic, 2 (1.8%) were malignant and 1 (0.9%) had an unusual cell combination (Table 8).

Of the 33 cases where a histologic diagnosis could be made, 13 (39.5%) were simple fibroadenomas, while there were 3 cases (9.1%) each of inflammatory reaction, duct ectasia, and non specific histologic findings. There were 2 cases of cystosarcoma phylloides classified in this study as malignant, and 2 of fibrocystic mastopathy (Table 9). There was correlation between mammographic and histologic diagnosis in only two cases of fibroadenoma.

It was also observed from the clinical records that patients were in most cases planned for histological

investigation at the same time as the mammography was requested. Mammography was therefore used as just a supplementary investigation and not to help the clinician decide whether to take biopsy or not.

Cystosarcoma phylloides, though classified in this study as malignant, may act as a benign or malignant tumour and may even metastasize. It has well defined margins radiographically and may contain coarse irregular calcifications[29].

PATIENTS WITH PALPABLE LUMPS CLINICALLY

A total of 52 patients in this study had palpable lumps on physical examination.Their mammographic diagnoses were as follows (Table 10):

21 (40.4%) had normal mammograms;

3 (25%) had fibroadenomas;

9 (17.3%) had non specific benign disease;

3 (5.8%) had simple cysts;

2 (3.9%) had a mammographic diagnosis of carcinoma of the breast.

For these patients,histological findings were available for only 20 patients, which were as follows (Table 11):

11 (55%) _ fibroadenoma;

2 (10%) _ Inflammatory reaction;

7 (65%) _ Lactating adenoma, mastitis in pregnancy, fibrocystic mastopathy, keloid, fibrosis, cystosarcoma phylloides,and non specific (one case of each).

40% of the palpable lumps were therefore missed by mammography in this study,and these can be considered as false negatives. This may have been reduced if supplementary mammographic views e.g. magnification views of supiciuos areas were taken. In their series, Susan M. Williams et al had a false negative rate of 74% in such patients [3].

CONCLUSION

1. Some of the patients that underwent mammography were below the age of 20 years which is the minimum age that should undergo mammographic examination.

2. There was no adequate follow up of patients either because their clinical records were missing or because they were referred from clinics where follow up was not possible.

3. The only supplementary mammographic views that were done in this study were axillary views. No magnification views of suspicious areas were done. There was also no method of localising palpable abnormalities prior to mammography which is helpful in ensuring that the mammographically abnormal area corresponds to the area of palpable abnormality.

4. There was poor utilisation of other imaging modalities even when recommended by the radiologist.

5. Clinical management of the patients did not appear to depend on mammographic findings.

6. There was a 40% false negative rate for detection of palpable lumps in this study. This may have been improved by utilisation of supplementary mammographic views.

7. There was no proven yield of malignancy in this study.

RECOMMENDATIONS

1. Clinicians should be made aware of the role of mammography in the investigation of symptomatic patients, especially in the young age group.

2. There should be a clear protocol of mammographically investigating patients based on the age of the patient, sex, clinical signs and symptoms, and observations from this and other centers.

3. Mammography should only be performed on patients referred from places where clinical follow up is assured, preferably only from the consultant's clinics.

4. Radiologists should also help in deciding the best imaging modality for patients referred for mammography based on the clinical findings (e.g a patient with a palpable lump may benefit from an initial ultrasound before mammography).

5. Radiologists or radiographers should device a method of *marking on the patients skin the region of the* palpable abnormality to make sure it corresponds to the mammographically detected or suspicious abnormality.

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APPENDICES

APPENDIX 1: THE X – RAY REQUEST FORM USED FOR MAMMOGRAPHY

KENYATTA NATIONAL HOSPITAL

M.O.H 206

X-RAY REQUEST/REPORT FORM

TYPE OF INVESTIGATION REQUESTED				NAME	
WALKING	CHAIR	TROLLEY	PORTABLE	SEX	AGE
APPOINTMENT		TIME		HOSPITAL No.	
HISTORY OF ALLERGY			(Yes/No). If Yes	IP/OP	
specify					
				REPORT TO BE SENT TO	
L.M.P		IF PERIODS MISSED		PREVIOUS X-RAY No.	
IS EXAM STILL NECESSARY			(Yes/No)		
BRIEF CLINICAL SUMMARY:				OFFICIAL USE ONLY	
				No. of Films	
				Charges	
				Comments	
REQUESTING DOCTOR (Print Name)					
SIGNATURE		DATE		RADIOGRAPHER NAME	
X-RAY No.				SIGNATURE	

X-RAY REPORT:

RADIOLOGIST NAME	SIGNATURE	DATE

GPK (L)

APPENDIX 2: DATA SHEET

MAMMOGRAPHY FOR PATIENTS LESS THAN 30 YEARS OF AGE AT KENYATTA NATIONAL HOSPITAL

CASE NUMBER.......

1. NAME........AGE........SEX........DATE OF EXAM..........

   X-RAY NUMBER........UNIT NUMBER..........CLINIC........

2. REASON FOR MAMMOGRAPHY.................................

   ....

3. PHYSICAL EXAMINATION FINDINGS.........................

   ....

4. MAMMOGRAPHY REPORT....................................

   ....

   RECOMMENDATION..

   ....

5. RESULTS OF OTHER IMAGING MODALITIES:

   ULTRASOUND..

   ....

   DUCTOGRAPHY...

   ....

   OTHERS..

   ....

   RECOMMENDATION..

   ....

   ....

6.   BIOPSY RESULTS...

      ....

      ....

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