AN ANALYSIS OF 1347 CASES OF MALIGNANT TUMORS OF THE BREAST WITH SPECIAL REFERENCE TO MANAGEMENT AND END-RESULTS

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The one important point to bear in mind in the consideration of any tumor of the breast is that it may be the starting point of a malignant growth. This is true whatever etiological factors may seem to have been involved in the formation of the tumor; whatever its site, whatever the age of the patient, whatever the family history may disclose. We shall have more to say regarding the potentialities of each of these factors; we mention them here only for the purpose of once again sounding the tocsin for though it has been sounded persistently by many writers on this subject, still the warning has not been sufficient for a period of watchful waiting is allowed in too many cases of apparently benign growths with dire results to the patient.

Age Incidence.— The greatest incidence of cancer of the breast is generally placed in the decade between 46 and 56 years. So often has this statement been made that there is danger of overlooking the fact that cancer of the breast may occur at any age. In our own series of cases the range has been from 20 to 87 years (table 1).

TABLE I

Age Incidence of Malignant Tumors of the Breast (Cleveland Clinic Series)

No. of Years	*No. of Cases*	*Per Cent*
21-30	18	1.6
31-40	154	13.6
41-50	351	31.
51-60	330	29.2
61-70	211	18.7
71-80	60	5.3
Above 80	7	0.6
Number of cases in which age was stated	1,131	....

I know of no case in which cancer has occurred before the advent of puberty. That cancer of the breast, however, is not entirely dependent upon the changes in the breast due to its functional capacity is shown by the fact that it may occur in man. Wainwright has collected 418 such cases. In our series there have been nine cases of cancer of the breast in man, four of sarcoma and one of Paget's disease.

In the report of the Metropolitan Life Insurance Company for the years 1911 to 1922 the following statement is made regarding the age incidence of cancer of the breast:

"Cancers of the breast are almost never seen in childhood and very rarely in adolescence. They begin to assume a little importance in the age group of 25 to 34 years. Between 35 and 45 a particularly sharp rise occurs. Among white females of this age group breast cancers become as important as those of the stomach and liver, and the death rate is exceeded by no form of cancer except growths of the genital organs. Among the colored women at these ages, deaths from breast cancers are more numerous even than those from gastric and hepatic growths, and again are exceeded only by those of the genital organs. At ages 45 to 54 the mortality of breast cancers still exceeds that for those of the peritoneum, intestines and rectum, but is not so high as from malignant tumors of the stomach and liver and female genitals. From 45 years upward the rate continues to rise and reaches the maximum for both white and colored women at the highest age group. It is well after the menopause that the hazard from breast cancer becomes greatest."

Heredity.— Since one in ten women after the age of 40 dies of cancer, it is clear that as far as chance is concerned, a cancer history is almost to be expected. Nevertheless, there are families in which the presence of cancer in two or more successive generations raises the question as to whether or not it is hereditary. In our series 257 cases or 28.9 per cent gave a positive history of the occurrence of cancer of the breast in other members of the family. In this connection it is of interest to cite a statement by Johnson and Lawrence:

"Among 500 consecutive cases of carcinoma of the breast treated in University College Hospital, there was a family history of malignant disease in 81, and in 37 of the 81 cases the disease was stated to have been in the breast. In one of this series of cases the patient's mother and her sister died from cancer of the breast and the father's sister from cancer of the mouth; of the patient's sisters two died from cancer, one of the stomach and one of the breast. If heredity plays any important part in the causation of the disease it might be expected that it would lead to its incidence before the average age. In this connection it may be stated that among the 500 cases of cancer of the breast referred to above, the average age at which the disease was first noticed was 49.62 years, whereas among the 81 cases in which any evidence of heredity could be traced, the average age was 48.74 years. The difference in this series of cases is so small as to be negligible but individual cases of carcinoma occurring at an unusually early age are sometimes met

with, as in one of the families mentioned above, in which the probable effect of heredity can not be disregarded."

As a practical clinical matter, it is evident that the hereditary factor in cancer, even if it exists, is not of much importance. Certainly the possibility of hereditary influence should never be even suggested to the daughter of a mother who has died from cancer of the breast.

Trauma.— To what extent trauma predisposes to cancer is uncertain. Nevertheless, that a definite relation may exist between cancer of the breast and trauma is indicated by various published statistics such as those of Hoffman who states that in one series of 314 cases of cancer of the breast trauma was considered as the probable etiological factor in 44 or 14 per cent. In our series there was a definite history of traumatism in only 195 cases or 14.5 per cent. A further suggestion as to the possible influence of traumatism is found in the fact that the most common location of a cancer of the breast is at the point of greatest strain from the weight of the breast. In our series the upper outer quadrant was the site of cancer in 275 cases or 20.4 per cent. One could well imagine the repeated physical injury to which tubules and acini may be subjected by being pressed upon or twisted by the weight of the breast. It would appear that even if there is no causative relation between cancer and *external* trauma of the breast there may be a definite relation between cancer and continual *internal* trauma.

In view of this possible relationship also, massage of the breast is contraindicated. Only the gentlest manipulations should be used, for once cancer has developed massage will promote its dissemination.

In our series 48 cases gave a history of massage of the breast.

Lactation.— Whether or not cancer of the breast bears any relation to lactation has been disputed. Hoffman states that in Ceylon "cancer of the breast is rare though native women suckle their children for a long time." In our series 576 patients had borne children and there is a positive history of lactation in 241 cases.

Precancerous Lesions.— The one important point to bear in mind in considering precancerous lesions of the breast is that almost any lesion of the breast may be transformed into a malignant growth though this occurs but rarely. Nevertheless there are certain lesions of the breast which may safely be exempted from the above generalization. There are simple cysts, lipomata, traumatic fat necrosis, hypertrophy, acute mastitis, mastitis neonatorum, mastitis adolescentium, echinococcus cysts, and syphilis.

Chronic mastitis deserves special consideration because of the diversity of opinion as to its cancerous potentialities. In general it is acknowledged that a lesion of this type may become malignant, especially if the lesion is unilateral. If the condition is present in both breasts malignant changes almost never develop.

Diagnosis.— Unless a precancerous condition has been present in the breast there are no demonstrable symptoms or signs of cancer in its earliest stages. Pain is practically never present in the earliest stages of the development of a cancer anywhere. In the late stages, however, pain may become a distressing symptom.

As Bunts has stated, "axillary involvement, fixation of the tumor, bleeding from the nipple, retraction of the nipple, ulceration of the skin and cachexia are sometimes referred to as the *classical symptoms* of breast cancer. It would be better to discard this classification entirely, however, for if one waits for the development of these classical symptoms the last chance of surgical relief will have passed."

What about biopsy as a diagnostic measure? In our opinion it is never justified, for while it has not been clearly proven, it is highly probable that cutting into cancer tissue may disseminate the disease. If there is even a chance that this may occur biopsy is not justified. In addition, we have found that the scar tends to add further growth energy to a tissue in which an abnormal degree of such energy has already been manifested by the presence of a tumor. Thus it is safer always to remove the tumor in its entirety rather than to cut into it. If this cannot be done without the removal of the entire breast, then the entire breast should be removed. If the tumor is found to be malignant the radical operation may then be completed.

Prognosis.— The prognosis is affected by the stage of the growth, the extent of involvement, the age of the patient, her temperament and personality, the presence or absence of pregnancy and lactation, and the presence or absence of involvement of the axillary glands.

The younger the patient the less favorable the prognosis; the older the patient the more favorable the prognosis. In the eighties and nineties cancer makes slow headway and sometimes seems to grow old and feeble with the patient. Regardless of age, if a cancer is present in an individual with a vivacious, vivid personality, the prognosis is bad. The more nearly the patient resembles a smoked herring the better the prognosis. Cancer in a lactating breast usually develops rapidly and the outcome is usually fatal. As a tragic illustration of the last two points may be offered the case of a patient, with a vivid and vivacious personality, twenty years of

age, who shortly before I saw her had given birth to her first baby. Her breasts were large and turgid. There was a small lump in the upper outer quadrant which was excised and found to be a cancer. A radical excision of the breast with the axillary glands did not even halt the downward course of the patient. The lungs rapidly became involved and death ensued within a few months.

When the axillary glands are involved, especially if many glands are involved, even though they be small, low resistance to the growth or a high degree of growth energy or both is indicated and the prognosis is correspondingly bad. On the other hand if but a single large axillary gland is involved, the prognosis is correspondingly better.

The general prognosis in patients who now present themselves to the surgeon as compared with the prognosis in former years is progressively better. This is the result of the extending propaganda for an immediate visit to the physician when any abnormality in the breast is noted. Patients are now reporting more promptly and the results of operation are correspondingly improved. (table II.)

TABLE II

Length of Time Between Discovery of Tumor and Operation

No. of cases in which data are available	
Under 1 month	124
1 to 6 months	377
6 months to 1 year	93
1 to 2 years	92
3 to 4 years	81
Over 5 years	10
	777

Operation.— Once the diagnosis of a tumor in the breast is made, operation should not be delayed. As we have stated, if there is any doubt regarding the malignant character of the growth, it will be found in any considerable series of cases that more lives will be saved by the removal of the entire breast, the axillary dissection being deferred until the immediate report from the pathologist determines the necessity for it.

There is only one condition under which a local excision may be made with entire safety, that is in the case of a single simple retention cyst. It must never be forgotten that the development of carcinoma may be favored by scar tissue. A lump may be removed which is pronounced by the pathologist to be benign. Later, however,

a recurrence may develop in the scar and become malignant presumably as the result of irritation by the scar tissue.

Various incisions for radical operation have been advocated, the best known being those of Halsted, Jackson, Willy Meyer and Rodman. It makes little difference what plan is followed as long as full opportunity for the complete removal is provided with ready access to the axilla.

Halsted believed that the pectoral muscles should always be removed. There are many cases of early cancer, however, in which a sharp dissection of all the fascial planes and a complete axillary dissection removes all the lines of cancer extension, and in such cases cures are effected in as high a percentage as by the more mutilating excisions. Each surgeon will make this decision according to his actual experience.

The axillary dissection should be done in such a manner as to allow a clear view of the glands for not a single axillary gland should be left behind.

The axillary glands are most completely removed by sharp dissection in order to avoid any chance of squeezing out contaminated lymph as might happen with blunt dissection. In our series recurrence in the chest wall or axilla is rare. (table III.)

TABLE III

End Results of Operation for Malignant Tumors of the Breast

Total No. of cases	*Carcinoma*	*All other malignant tumors*
Cases available for end-result data	523	32
3-5 year survivals	284—54.3%	23
5-10 year survivals	196—37.4%	21
10 year survivals	83—15.8%	11

Radiation.— What is the role of radiation in carcinoma of the breast? Our radiotherapy department under Dr. U. V. Portmann and our surgical division are agreed on the following conclusions: Our experience testifies against the use of radiation before operation. A course of radiotherapy takes time — usually at least two weeks. Radiation, of itself alone, cannot entirely cure a carcinoma of the breast as securely as a complete surgical excision following preoperative radiation since some cells probably would not be destroyed by the radiation, and during those two weeks this residual carcinoma would be growing and extending.

As for postoperative radiation, Portmann, by an extensive statistical study of the comparative results of operations for cancer

of the breast with postoperative and without postoperative radiation has convinced us that (1) the average natural duration of life for a patient with carcinoma of the breast is three years; (2) as a result of radical operation about 38 per cent of the cases will be free from the disease for the natural duration of life and the average survival for five years will amount to about 30 per cent; (3) intensive cross-fire postoperative radiation is harmful but as the result of repeated superficial doses at least ten per cent more patients may be expected to survive for five years than among non-radiated cases; (4) gratifying results may be obtained from radiation in some hopelessly advanced cases of carcinoma of the breast.

Portmann's comparative studies from series of cases in the Cleveland Clinic are given in the accompanying tables. (tables IV, V, and VI.)

TABLE IV

Summary of Results of Treatment of Carcinoma of the Breast

Treatment	*Total Cases*	*Traced Cases*	*Living 3-5 Years*	*Living 5-10 Years*	*Living More Than 10 Years*
Operation only	741	523	284—54.3%	196—37.5%	83—15.8%
Operation and Radiation	395	275	124—45.1%	72—26.2%	15— 5.4%
Radiation only	43	22	5—22.73%	3—13.6%	0

TABLE V

Cancer of the Breast
(Cleveland Clinic Series)
Prior to 1924

Treatment	*No. of Cases*	*Living Less Than 3 Years*	*Living 3 to 5 Years*	*Living 5 or More Years*
Surgery alone	345	39.1%	28.1%	23.1%
Post-operative x-ray	92	39.1%	26.0%	35.8%

TABLE VI

Malignant Tumors of the Breast
(Cleveland Clinic Series)
Since 1924

Treatment	*No. Cases*	*Living or Dead With Recurrence in First Post-Operative Year*		*Recurrences During 1 to 3 Year Period*		*Living Without Recurrence First Year*		*Living 1 to 4 Years No Recurrence*	
Surgery	50	12	24%	18	36%	20	40%	12	24%
Surgery plus x-ray	61	11	18%	13	21.3%	37	61%	18	29.5%

As Wainright has demonstrated, a malignant growth usually involves the entire mammary area which may be infiltrated with multiple tiny malignant areas many of which seem to be entirely independent of the primary tumor. Such areas as these may well be reached by the postoperative radiation. Another important point in a well-planned attack by radiation is that early metastases below and above the clavicle, and in the chain of lymphatics leading down to the chest cavity, may be destroyed. The added security given by

radiation may be achieved by arresting the advance of the disease beyond the scope of other methods of treatment. (table VII.)

TABLE VII

Sites of Recurrence and Metastasis in Carcinoma of the Breast

1. RECURRENCE:			
Local		194	37.31%
Skin		15	2.88%
Chest Wall		18	3.46%
Axilla		61	11.73%
Supraclavicular		41	7.88%
Other Breast		65	12.50%
Other Axilla		17	3.27%
Other Supraclavicular		5	0.96%
2. DISTANT METASTASIS:			
Abdomen		14	2.69%
Abdominal Wall		2	0.38%
Bones		79	15.19%
Breast Bone	2		
Clavicle	4		
Femur	11		
Humerus	3		
Hip	9		
Leg	1		
Pelvis	14		
Ribs	6		
Scapula	2		
Shoulder	2		
Skull	4		
Spine	48		
Sternum	3		
Tibia	1		
Thorax	2		
Carcinomatosis		17	3.27%
Cerebrum		10	2.69%
Chest Wall		25	4.81%
Esophagus		1	0.19%
Eye		1	0.19%
Gall Bladder		1	0.19%
Glands (not including axillary and supraclavicular)		39	7.50%
Intestines		6	1.15%
Kidney		3	0.57%
Liver		34	6.53%
Lungs		97	18.65%
Mediastinum		15	2.88%
Multiple Metastasis		5	0.96%
Ovary		1	0.19%
Pelvis		2	0.38%
Stomach		9	1.73%
Scalp		1	0.19%
Total Cases with Recurrence and Metastasis			520

Cause of Death.— What is the usual cause of death after operation for carcinoma of the breast? If the radical operation has been performed and postoperative radiation has been employed, the usual cause of death is metastasis in the lungs, and less frequently though not uncommonly in the bony skeleton. When one remembers the rich lymphatic supply of the breast as well as of the tissue planes extending from it, the possibility of early and distant as well as near dissemination becomes manifest.

Statistics.— Our total series of cases of cancer of the breast includes 741 which have been treated by surgery only, 43 by radiation only, 395 by both surgery and radiation.

Summary

1. In the presence of any tumor of the breast during the cancer age its surgical removal should be considered and with few exceptions it should be removed at the earliest possible moment after its discovery.

2. Removal of a tumor of the breast should include the entire breast tissue except in the case of a single retention cyst.

3. Because of the chance of disseminating malignant cells, biopsy should never be performed.

4. The type and extent of the excision should vary with the position and the extent of the cancer — experience and judgment are better guides than any single rule.

5. Postoperative radiation should be employed.