DIAGNOSIS AND TREATMENT OF LESIONS OF THE BREAST[1]

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The educational program which the American Medical Association has sponsored for a number of years has been of great benefit in the treatment of malignant disease. This is evidenced by the constantly increasing number of patients who are seeking medical advice earlier in the course of the disease, and the correspondingly increasing number of patients who deem it advisable to submit themselves to periodic general examination. This program has been particularly effective in influencing patients with early lesions of the breast to seek medical advice. Since the mammary gland is a superficial organ and is easily accessible to examination by the patient, an increasing percentage of patients are coming for examination when the clinical signs and symptoms of malignant disease are difficult to distinguish from those of benign lesions, and the responsibility of the physician is thus increased. The first examining physician must establish a definite diagnosis or at least rule out the presence of a malignant lesion, and he must also see that proper treatment is instituted.

The following study of the signs and symptoms of malignant disease of the mammary gland, and the indications and methods of surgical treatment of such lesions, is based on a series of 4,038 malignant cases in which operation was performed between 1910 and 1930; the surgical statistics and results of operations are based on 2,879 cases in which operation was performed between 1910 and 1927, inclusive, thus permitting the compilation of results over a period of five years from the time of operation.

That malignant disease is not confined to any definite period of life is evidenced by the age incidence in this series. The youngest patient was seventeen and the oldest eighty-five. The greatest incidence was in the decade between forty-five and fifty-four, in which 34.8 per cent of the cases occurred. The next decade in frequency of occurrence was that between thirty-five and forty-four, which represented 25.3 per cent of the cases; the third was fifty-five to sixty-four, which represented 23.2 per cent.

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The most common clinical sign of malignant disease of the breast is the presence of a tumor to which the overlying skin is fixed. The tumor is usually irregular in size, hard, infiltrating into the breast tissue, and usually not movable. A definite tumor was found in 93 per cent of the cases in this series; in 98 per cent of these it was single and in 2 per cent multiple. In about 6 per cent of cases the tumor was not definitely demarcated, and there was a diffuse infiltration of the entire breast. In 0.6 per cent of cases there was no palpable tumor. There may or may not have been enlargement of the regional lymph nodes.

The most common site of the tumor was the upper outer quadrant, where it occurred more than twice as frequently as in any other part of the breast.

The subjective sensations of pain are rarely present in malignant growths. Those most commonly experienced were burning and sticking, which were transitory and often simulated a slight pin prick of the skin; occasionally there was definite pain. These subjective sensations are rarely observed early, and usually indicate well advanced malignancy.

The recognition of malignant disease of the breast by the clinical signs and symptoms depends on the duration of the lesion at the time of examination; these signs and symptoms are hopelessly inadequate in determining early malignant disease. If sufficient time were permitted to elapse, it is probable that 100 per cent of these conditions could be diagnosed clinically, but meanwhile much valuable time would be lost before the institution of treatment, and in most instances the patient would lose any possibility of obtaining permanent cure from surgical treatment.

Fixation of the skin over the tumor is the most characteristic sign of malignant disease; it was observed in 82 per cent of cases. In studying this group with reference to the presence or absence of lymphatic involvement, it was found that in 72 per cent there was metastasis to the regional lymph nodes, which indicates that if fixation of the skin has occurred, metastasis will have taken place in approximately three-fourths of the cases.

The cases were studied also with reference to the duration of the tumor at the time of examination, in order to see if patients with malignant disease are presenting themselves earlier for examination. The results were somewhat discouraging. The average duration of the lesion, taken year by year from 1910 to 1930, was seventeen and four-tenths months. In 1910 and 1911 the duration was thirty-one and two-tenths and twenty-nine and six-tenths months, respectively. From 1912 to 1927, the duration varied from twenty-three and nine-tenths to twelve and nine-tenths months. From 1927 to 1930 the duration was from fourteen and

four-tenths to eleven and seven-tenths months. These data are of practical importance, for although there has been a slight decrease in the duration of the tumor in recent years, it indicates that malignant lesions of the breast are being seen too late in the course of the disease to insure the best surgical results.

In reviewing all lesions of the breast, benign and malignant, I found that the average duration of the lesions was approximately five months, and that about 40 per cent more of benign lesions are being seen now than were seen five years ago; this increase in the number of benign lesions accounts for the decrease in the duration of the lesion in all breast cases. I believe that this high percentage may be largely accounted for by the pain so commonly associated with benign lesions, and that it is probable that the importance of treatment of painless tumors is not being sufficiently stressed in our educational program.

Malignant growths are rarely painful in the early stages, which is one of the chief reasons why patients, in all stations of life, delay examination. In many instances they do not come for treatment until the lesion has ulcerated; in 1930, 7.9 per cent of cases of ulcerated lesions were observed. This high percentage of ulcerating lesions again emphasizes the fact that patients are being seen late in the course of the disease, and also points to the necessity of more arduous educational propaganda.

I do not believe that the presence or absence of metastasis to lymph nodes can be definitely ascertained on clinical examination in all cases. In the cases observed in the last year, palpable nodes were found in 60 per cent, in 68 per cent of which definite axillary metastasis was found at the time of operation. In the remaining cases the enlarged nodes were found to be inflammatory. In the 40 per cent of cases in which enlargement of the axillary nodes was not found, axillary metastasis was found in 29 per cent. In most cases these enlarged nodes were under the pectoral muscles along the axillary vein. In view of the frequency with which these palpable nodes are found to be inflammatory on microscopic examination, I do not believe we are justified in refusing operation because of their presence.

I have tabulated the percentage of cases with lymphatic involvement at the time of operation from 1910 to 1930. The average percentage was 64.2, and there was little variation in this percentage over that of the last ten years. In 1930 the percentage was 62.4. This again indicates that we are seeing patients too late in the course of the disease to expect the best results from surgical treatment. I also studied this group of cases to determine the percentage of lymphatic involvement during the different decades of life, and found that there was very little variation in the percentage of

involvement according to age. Of patients between the ages of fifteen and twenty-four years, 57.1 per cent had lymphatic involvement; between the ages of twenty-five and thirty-four, 63.0 per cent; between the ages of thirty-five and forty-four, 65.6 per cent; between the ages of forty-five and fifty-four, 64.3 per cent; between the ages of fifty-five and sixty-four, 66 per cent; between the ages of sixty-five and seventy-four, 59.2 per cent, and between the ages of seventy-five and eighty-four, 42.3 per cent. This shows that the greatest percentage of lymphatic involvement occurs in the group between thirty-five and sixty-four years, and it is during this period that we see the greatest incidence of carcinoma of the breast.

From a surgical standpoint, the most important lesions of the breast are those in which a definite diagnosis cannot be made clinically and in which the question arises as to whether it is best to keep the patient under observation or to treat the condition surgically. In all cases in which there is a single localized tumor, without definite clinical signs of malignant disease, the only safe course to follow to establish a definite diagnosis is the surgical removal of the tumor and microscopic examination. The tumor should be removed by wide excision, well away from the limits of the growth and without trauma to the lesion. Usually I prefer to remove a wedge-shaped piece of tissue including the tumor. The microscopic examination of the tumor should be made immediately after its removal, before the wound is closed. If the tumor proves to be malignant, the operation should be completed as a radical amputation; if it is benign, the breast can be reconstructed with very little deformity. If the microscopic examination of the removed tissue shows a proliferative type of mastitis, such as Schimmelbusch's disease, the entire breast should be removed, the operation being completed as a simple amputation.

I do not believe that it is ever justifiable to remove any growth from the breast without immediate examination of a frozen section of the tissue; the manner of completing the operation is indicated by the results of this examination. The poorest surgical results in carcinoma of the breast are obtained from secondary radical amputation after primary partial removal of the tumor. In a review of this series, I found that in 11 per cent of the cases a primary minor operative procedure had been carried out. The secondary operation was radical amputation. In this group lymphatic involvement had occurred in 79 per cent, as compared with 64 per cent in those in which primary radical operation had been done. The results of secondary radical amputation are correspondingly less satisfactory. These figures, however, do not give the true results in those cases in which a primary minor operative procedure had been done, because in approximately 50 per cent of these secondary

operation had not been done, the condition being hopelessly inoperable at the time the patients presented themselves for examination. This is particularly true of cases in which some type of escharotic had been used on the breast, as more than 80 per cent of these were inoperable.

The best surgical results are obtained by primary radical amputation. The technic of this procedure has been fairly well standardized. I do not make a uniform type of incision in the skin, as I believe that the best results are obtained when the incision is planned in each case so as to remove the greatest amount of skin over the diseased area and leave the least deformity and the least restriction of motion of the arm. If the incision is properly planned, in accordance with the situation of the tumor, sufficient skin can be removed so that there is little danger of local recurrence, and skin grafting is rarely necessary except in the most extensive cases. In general, if the tumor is in the upper or lower quadrant of the breast a vertical incision will give the best results in complete removal of the growth and adequate exposure for deep dissection. If the growth is in the extreme inner or outer quadrant of the breast, a transverse incision is usually best.

After the incisions in the skin have been outlined, the subcutaneous tissue is dissected around the entire operative field, the median portion of the dissection being carried to the median line, the lateral portion to the border of the latissimus dorsi muscle, extending below over the upper portion of the rectus fascia and above to the clavicle. Approximately two-thirds of the clavicular portion of the pectoralis major muscle is then divided and its attachment severed from the humerus. The lymph nodes along the upper portion of the brachial vessels are thoroughly removed, and the dissection is carried to the lower border of the pectoralis minor muscle. The attachment of this muscle to the coracoid process of the scapula is severed. The dissection of the axillary and sternal lymph nodes is entirely completed, removing all of the glands along the lateral wall of the thorax, along the axilla both above and below the axillary vessels to the entrance of the axillary vein into the thoracic wall. The branches of the axillary vessels are caught and ligated as the dissection of the lymph nodes proceeds toward the sternum, the long thoracic and subscapular nerves being preserved. This completely outlines the tissues to be removed, which are still attached to the wall of the thorax; they include the breast, subcutaneous tissue, axillary nodes and node-bearing fascia, the pectoralis minor, and the greater portion of the pectoralis major muscle. These structures are then dissected from the wall of the thorax, starting from the lateral aspect, the perforating intercostal vessels being ligated as the dissection proceeds. The anterior

sheath of the rectus muscle is removed as the dissection proceeds toward the median line, and the entire carcinomatous area is removed in one mass.

The results of radical operation depend to a great extent on the thoroughness with which the operative procedure is done. I do not think the importance of this can be overestimated, inasmuch as the only possibility of obtaining cure from surgical treatment is from the original operative procedure. In my experience secondary operative procedures have been of little benefit. The best surgical results are obtained from primary radical amputation in cases in which there is no lymphatic involvement. In this group 80.2 per cent of patients were living three years, 67.4 per cent five years, and 52.9 per cent ten years after operation. In cases in which there was lymphatic involvement, the results were not as satisfactory but probably more satisfactory than in cases of metastatic malignancy elsewhere in the body. There were 41.7 per cent of patients living three years, 25.7 per cent living five years, and 12.2 per cent living ten years after operation.

In cases in which a definite clinical diagnosis of malignant disease can be made, the condition usually is fairly well advanced, and the decision as to the type of treatment to be instituted depends on the amount of involvement present. In cases in which the lesion is unilateral and clinical examination does not reveal evidence of distant metastasis, a primary radical amputation should be performed. In certain cases in which the supraclavicular nodes are palpable, radical amputation may be done because of the possibility that the nodes are inflammatory. In such cases it is best to apply radium to the nodes subsequent to operation because of the possibility that they may be metastatic. I do not believe that operation is advisable if clinical examination demonstrates definite distant metastasis to the lungs, bones, or liver. If there is an extensive ulcerating lesion, and a possibility of removing the ulcerated area and closing the skin, I believe a radical amputation should be done, rather than a more palliative procedure such as a simple amputation. There is very little additional risk in radical amputation, and in such cases it is in reality palliative. I believe that the prognosis is much better with radical operation.

The most valuable indications as to the prognosis in carcinoma of the breast are the degree of malignancy and the extent of the disease as indicated by the absence or presence of lymphatic involvement. Broders, studying tumors removed from the breast since 1910, has reviewed 2,879 of the entire series of 4,038 cases, and this I believe is a sufficient number on which to base a preliminary report.

Of the 2,879 cases, 2.9 per cent were found to be of Grade 1, 12.2

per cent of Grade 2, 33.6 per cent of Grade 3, and 51.3 per cent of Grade 4. Lymphatic involvement was found in 14.3 per cent of cases in which the carcinoma was graded 1; in 48.1 per cent of those graded 2; in 76.6 per cent of those graded 3, and in 88.6 per cent of those graded 4. This shows that the majority of the carcinomas were highly malignant, 84.9 per cent of the entire series being graded 3 and 4. The significance of this from the standpoint of prognosis is emphasized by the high percentage of these two groups in which there was lymphatic involvement: 76.6 per cent graded 3 and 88.6 per cent graded 4. It would seem that most carcinomas of the breast metastasize early to the regional lymph nodes.

The cases were also studied to determine if there was any definite relationship between the age of the patient and the degree of the malignancy with and without lymphatic involvement. It was found that the average age of patients with carcinoma graded 1, with lymphatic involvement, was forty-five and eight-tenths years; of those with carcinoma graded 2, fifty years; of those with carcinoma graded 3, fifty years, and of those with carcinoma graded 4, fifty and one-tenth years. The average age of corresponding patients without lymphatic involvement was forty-eight and five-tenths years, fifty-one and eight-tenths years, fifty and nine-tenths years, and fifty-two and one-tenth years, respectively. Little variation was shown in the average age of patients presenting the four different grades of malignancy.

The surgical results following radical amputation in cases with and without lymphatic involvement were compared for each of the four grades of malignancy. It was found that of the 2,231 cases with lymphatic involvement, 0.6 per cent of the lesions were graded 1; 100 per cent of these patients lived three years, 100 per cent lived five years, and 80 per cent lived ten years. In 7.6 per cent of the cases, in which the lesions were graded 2, 69.4 per cent of the patients lived three years, 49.1 per cent lived five years, and 38.1 per cent lived ten years. In 33.2 per cent of the cases, in which the lesions were graded 3, 49.2 per cent of the patients lived three years, 26.9 per cent lived five years and 10.3 per cent lived ten years. In 58.7 per cent of the cases, in which the lesions were graded 4, 34.4 per cent of the patients lived three years, 19.4 per cent lived five years, and 11.3 per cent lived ten years. In the total number of cases in which there was lymphatic involvement (all grades included), 42.2 per cent of the patients lived three years, 25 per cent lived five years, and 13.7 per cent lived ten years.

The total number of cases in which there was no lymphatic involvement was 648; 77.6 per cent of these patients lived three years, 66.4 per cent lived five years, and 49.0 per cent lived ten years. In 11.1 per cent of the cases without lymphatic involve-

ment in which lesions were graded 1, 95.1 per cent of the patients lived three years, 93.1 per cent lived five years, and 83.3 per cent lived ten years. In 28.1 per cent of cases, in which lesions were graded 2, 88.5 per cent of the patients lived three years, 76.4 per cent lived five years, and 48.7 per cent lived ten years. In 34.9 per cent of cases, in which lesions were graded 3, 73.4 per cent of the patients lived three years, 61.8 per cent lived five years, and 46.9 per cent lived ten years. In 25.9 per cent of cases, in which lesions were graded 4, 67.6 per cent of the patients lived three years, 54.4 per cent lived five years, and 38.8 per cent lived ten years.

This shows a definite and uniform relationship between the operative results and the degree of the malignancy, in that the lower the degree of malignancy the higher the percentage of patients living three, five, and ten years after operation. It also shows that the surgical results are much more satisfactory in cases without lymphatic involvement than in those with lymphatic involvement. This was found to be true in all grades of malignancy. The grading of malignant tumors of the breast is, therefore, of great practical value as an index of the prognosis in cases in which radical operation has been done.

The results in those cases in which postoperative roentgen treatment had been given and those in which it had not been given were compared. The cases with lymphatic involvement in which roentgen-ray treatment had been given showed an average of 4.8 per cent more patients living three and five years whose lesions were graded 3 and 4, and 4.2 per cent fewer living ten years whose lesions were graded 1, 2, 3, and 4. There were 2 per cent fewer patients living three and five years whose lesions were graded 1 and 2. These results indicate that postoperative roentgen-ray treatment may be of benefit for highly malignant lesions, particularly if there is lymphatic involvement, but it should not be used as a routine, since the results are less satisfactory in the lower grades of malignancy, and in the ten-year results of the higher grades. I believe that roentgen-ray treatment is of benefit in selected cases, but that in some it may be detrimental. If severe reaction follows, its use should be discontinued. I have seen a number of cases of this type in which distant metastasis occurred earlier than would have been expected from the degree and extent of malignancy found at operation. Because of the lack of uniformity of results in the different grades of malignancy, and the fact that there was no marked variation in the results obtained with and without roentgen rays, I believe the practical teaching of this study is that the patient who is accepted for surgical treatment should have as radical and thorough an operative procedure as

possible, since the roentgen ray cannot be depended on to remove any malignant tissue that may be left as a result of an incomplete operation.

Summary and Conclusions

No marked progress has been made in instituting surgical treatment early in the course of malignant disease of the breast.

The present clinical methods are inadequate to detect malignancy until it is fairly well advanced.

Microscopic examination should be made in all doubtful cases, followed immediately by radical operation if the lesion proves to be malignant.

The best results are obtained from primary radical amputation in cases without lymphatic involvement. In the series studied, 80 per cent of patients were living three years, 67 per cent five years, and 52 per cent ten years after operation. In cases with lymphatic involvement, the results are not as satisfactory but probably are more favorable than in cases of metastatic malignancy elsewhere in the body. In this group there were 42 per cent of patients living three years, 26 per cent five years, and 12 per cent ten years after operation. The poorest surgical results are obtained in cases in which a secondary radical amputation is done following a primary partial operative procedure.

The most important indications as to prognosis are the degree of the malignancy and the presence or absence of lymphatic involvement.

The majority of malignant lesions of the breast are highly malignant.

The grade of malignancy of lesions of the breast has no definite relation to the age of the patient.

Surgical results are more satisfactory in the lower grades of malignancy.

Postoperative roentgen-ray treatment is not a definite auxiliary to surgical treatment. In selected highly malignant cases it may be of value, but it is of no benefit in cases of low-grade malignancy.