

A STUDY OF TWENTY-NINE CASES OF CANCER  
OF THE BREAST SUBMITTED TO  
OPERATION.<sup>1</sup>

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*Efficacy of Operation for Breast-Cancer.*—The efficacy of this operation has increased together with the general surgical progress of the last few years. In 1878, von Winiwarter (*Beiträge zur Statistik der Carcinome*, Stuttgart, 1878) reported upon 170 cases of carcinoma of the female breast observed by Billroth between 1867–76; 143 were operated upon, with a mortality of 34, or 23.7 per cent.; 82 per cent. of the remainder, whose subsequent history was known, had recurrences; 8.3 per cent. of those whose operations antedated the report by three years or more were alive and free from recurrence or metastasis.

The rapidity of recurrence in these earlier cases may be indicated by the combined statistics of 203 operative cases reported by von Winiwarter and Oldekop (*Archiv für klinische Chirurgie*, Band xxiv, p. 579), in whom thirty-nine recurred within fifteen days, and fifty recurred within one month.

An indication of the progress of the succeeding seventeen years is furnished in Curtis's paper (*New York Medical Record*, February 24, 1894, p. 228), in which he summarizes the results from 1213 cases, which had been reported between 1888 and 1893 in European clinics. The mortality

<sup>1</sup> Read before the Surgical Section of the New York Academy of Medicine, November 11, 1897.

was 5.9 per cent., and among the 813 cases, whose subsequent history had been followed, 22 per cent. remained free from recurrence or metastasis for three years or more.

Since that time there have been some notable contributions to the subject, which may be tabulated as follows:

Operator and Reference.	Number of cases whose subsequent history could be followed.	Number alive and free from recurrence three years after operation.	Percentage.
Bull: <i>New York Medical Record</i> , 1894, Vol. ii, p. 223. . . . .	75	20	26.6
Rotter: <i>Berliner klinische Wochenschrift</i> , 1896, Nos. 4 and 5. . . . .	10	5	50.0
Helferich: <i>Deutsche Zeitschrift für Chirurgie</i> , 1896, Vol. xlv, 101. . . . .	35	10	28.6
Cheyne: <i>Lettsonian Lectures</i> , 1896. . .	21	12	57.0
Dennis: <i>System of Surgery</i> , 1896, p. 931.	38	17	45.0
May: <i>British Medical Journal</i> , 1897, Vol. i, p. 1269. . . . .	20	7	35.0
Total . . . . .	199	71	39.6

This remarkable showing of 199 cases with 39.6 per cent. of cures, reckoned on the three years' basis, surely indicates a great advance in the efficacy of the operation.

It also indicates that cases are now brought to the surgeon before the growths are so far advanced as they used to be.

The mortality from the operation has also diminished most remarkably. Weir (*New York Medical Record*, December, 1892, p. 752) has reported 125, and Halsted and May each seventy-six consecutive operations without a single death. Dennis has operated upon seventy-four cases, with only one death, and that from hæmophilia, and Cheyne has operated upon sixty-one cases, with only one death, with which, probably, the ether had as much to do as the operation.

The cases here reported number twenty-nine, operated

upon since March, 1893. In only six instances were the operations more than three years ago. Three of these cases are alive and well, and have been busily occupied during this time; they have no visible recurrence. One of the three had two or three small nodules removed from the axilla in another city about six months after her operation here. I do not know their nature,—at the publication of this paper,—three years have elapsed since this second operation. The fourth case has also had good health since the operation, but has just developed at the termination of the three years a small spot of induration at the margin of the cicatrix. The other two died of lung-disease, which was apparently cancerous; one twenty-two and the other two and one-half months after operation; they had no local recurrences. These six cases are not cited as showing what can regularly be expected from operation for cancer of the breast. The number is too small to furnish material for deductions. They are simply related to add another slight contribution to the great mass of evidence which is accumulating to show the efficacy of the operation. I had expected to include two other cases in the number of those who had lived for more than three years, but cannot do so on account of the failure to find a pathological report from the specimens. One lived three years and died with evidence of pulmonary metastasis. The other was living at the lapse of three years, but I am unable to find the present address of herself or her friends. These cases were operated upon by the method ordinarily known as Volkmann's, which consists in removing the breast, the lymphatics, and fat from the axilla, and, in most instances, the fascia or superficial layers of the pectoralis major muscle.

The remaining cases of this series indicate the efficacy of the operation in a measure, but the ultimate result cannot be told, as sufficient time has not yet elapsed; 52 per cent. of them are now alive. The deaths which have occurred have been mostly from metastases. Although they do not furnish proofs of the permanent efficacy of the operation, they do

give a basis for studying the objections sometimes raised to the operation.

*A Consideration of the Technique of the Operation.*—The most pressing question concerning the technique of the operation now is, How widely shall the tissues be removed? About three years ago Halsted (*ANNALS OF SURGERY*, 1894, Vol. xx, p. 497) and Willy Meyer (*New York Medical Record*, December 15, 1894) almost simultaneously advocated extensive operations, which consisted in the removal of the breast and axillary contents, and a large part or all of one or both pectoral muscles in one mass. The removal of the lymph-nodes above the clavicle was also advised, but was not described as essential to either operation. These extensive operations have been done by many surgeons since that time, but few reports have been made concerning their efficacy. It removes muscles and fascia which are often cancerous, and gives such clear and easy access to the axilla as to permit the thorough removal of involved and suspicious lymphatics and fat. It should therefore be done, unless there are reasons for not doing it. The cases here recorded are sufficient to make a basis for studying the objections sometimes raised to the operation.

(1) *The Mutilation of the Patient.* This does not seem to be a valid objection. I have had the opportunity of tracing the history of twenty-six patients operated upon by this method, for periods varying from a few months to nearly three years. All had good use of the arm; they could raise it so as to dress the hair, could use it in ordinary household duties, and could put the hands behind the back. There is slight loss of power in adduction, which is, however, hardly noticed by the patient. Patients have been shown time and again in the meetings of the various medical societies who had good use of the arm after this operation. The one shown at the reading of this paper is an example. She is able to wash, iron, scrub, and do general house-work, two and a half years after her operation, although her pectoralis major, excepting a part of its clavicular portion, has been removed; by a dynamometer

the power of adduction with the hand in front and the elbow nearly straight is only one pound less upon the side of operation than upon the other side. The other muscles, particularly the coraco-brachialis and the anterior fibres of the deltoid, assume a function which was performed by the pectoral muscles, so that the patients, as a rule, do not suffer materially from loss of power.

(2) The second objection which has been raised is the oedema, which may be caused by the stripping of so long a portion of the axillary vein. This has been temporary in all those cases in whom it has existed at all.

(3) The third objection is the increased danger from the operation. If asepsis is preserved and hæmorrhage is quickly stopped, the radical operation is not more dangerous than the thoroughly performed Volkmann operation. The removal of the sternal portion of the pectoralis major or even the entire muscle is easier than the stripping off of its superficial layer, and retracting it so as to gain good access to the apex of the axilla. It is accompanied by less hæmorrhage and less bruising of the tissues and fewer "dead" spaces are left. In this series there was only one fatal case, and that was a woman of seventy-three, whose resisting power was so slight that she succumbed to an infection which probably would not have been important in a stronger patient.

Some surgeons advise the removal of the muscles in the far advanced cases, but leave them in the recent ones; but it is in the recent cases that a thorough operation is most important. If any cases are to be deprived of the advantage of a radical operation it should be the more advanced ones, for in many of them the growth has already advanced beyond the tissues which are accessible by operation. In the recent cases we have far more hope of really eradicating the disease. The size of the lump in the breast is no certain indication of the extent of the growth in the axilla. I have found very extensive axillary and cervical involvement where the mammary nodule was not larger than a walnut.

The clearing of the posterior cervical triangle is advised for all cases by some operators; others say that if the cervical lymphatics are involved the disease has already spread to the mediastinum or other inaccessible parts, and hence any but a palliative operation is useless. In this series of cases the cervical triangle has not been explored as a routine, and I have failed to see evidences that the patients would have been better had it been done. Still, the supraclavicular lymph-nodes are frequently cancerous, and if so they are a menace, and as their removal does not add very materially to the length or danger of the operation, one cannot well argue against it. It will, doubtless, be done more in the future than it has been in the past.

The extent of the skin incision is a question of great importance. The method for these patients has been to carry it about two inches from any place where the growth impinges upon the skin, irrespective of the possibility of uniting the skin edges afterwards. The upper part of the incision is carried to the insertion of the pectoralis major passing above rather than through the axilla. The skin is then widely laid back externally and below so as to expose the latissimus dorsi and the lower fibres of origin of the pectoralis major, and above and internally to the clavicle and sternum. The chief purpose of this is, of course, to permit the removal of the subcutaneous tissues, but it gives the additional advantage of permitting the skin to be approximated to a remarkable degree, so that usually there is no defect to be filled in by grafting or granulation. In approximating skin edges considerable tension may be used if the parts at a distance from the wound are thoroughly supported by the dressing. If there is a defect, skin-grafting at the time of the operation is generally the easiest way to cover it. If all preparations have been made, it only adds a few minutes to the duration of the operation. No recurrence has occurred in these patients, which apparently would have been obviated by a wider skin incision.

The axillary artery or vein has not been cut because

no patient would have been benefited by that procedure. In the only case in which they were involved in the growth it had also spread so far as to render any operation but a palliative one useless. The long subscapular nerve has not been cut, although parts of the vessels which accompany it have frequently been removed.

The cases of recurrence in or about the site of operation are the ones which should throw the most light upon the question of tissue removal. As the extent of these operations has increased, these recurrences have steadily become less frequent, until now we can confidently expect that they will come in very small number when the growth is not very extensive. The eight recurrences which have appeared among the twenty-three patients who have had the complete operation were with two exceptions in patients who had such extensive growths that only palliative operations could be done. In three (Cases XV, XVII, and XXV) of them the breasts contained large, ulcerating masses which involved the chest walls, and which naturally pressed forward from that location after the operation. Such cases should properly be considered under the head of palliative operations. All surgeons dislike to operate upon them, but do so because it often promotes comfort and prolongs life to a remarkable degree; one cannot, however, expect a cure when the chest wall is really involved in the growth. Two others (Cases XIII and XX) had such virulent types of the disease that operation, even of the most radical kind, availed nothing. The disease terminated fatally in each case ten months after its first appearance. In one the condition which has been described as mastitis carcinomatosa ("Diseases of the Breast," Williams, London, 1894, p. 318) existed. It looked more like phlegmon than cancer. The skin, subcutaneous tissue, and breast were infiltrated with nests of cancer-cells, and the rapid recurrence indicated that the surrounding tissues were similarly involved. The other acute case had only had symptoms for two months when admitted to the hospital. Nearly the entire breast was involved. A very

thorough Halsted operation was done. Four months later a secondary operation was necessary, and the axilla was found completely embedded in cancerous material. Such virulent cases as these are hopeless from the time when they are really started, and no deductions can be made from them in regard to the operative technique. Surrounding tissues quickly become so infiltrated with the disease that its removal is impossible. Fortunately, such cases are rare. The rapidity of growth is a most important element in the prognosis. A patient with a slowly growing cancer of considerable duration is more likely to be cured than one with a rapidly growing cancer of short duration. Case XXII had what Halsted calls a regional recurrence, six months after operation, consisting of multiple nodules scattered in the skin at a distance from the site of operation. The growth had existed a year at the time of operation, and infection must have already been carried to the skin by the lymphatics. It is doubtful whether any removal of the skin, which was practical, would have prevented this recurrence. The patient died with symptoms of metastasis in the lumbar spine three months later. The two remaining cases had local recurrences within the proper field of the operation. One noticed a freely movable filbert-sized nodule in the axilla twenty-two months after the operation. In the following year it grew to the size of a hickory-nut. The other developed a nodule in margin of the divided pectoral muscle. The first one indicates that even with careful dissection a bit of infective material which should be removed is sometimes left. The second recurrence would not have come if more of the pectoral muscle had been removed.

The small number of local recurrences indicates the advantage of very thorough and careful clearing of the field of operation. The eight cases who died of metastasis show how far the disease had advanced at the time of operation.

Taking the cases together, they argue for an early and thorough operation, and hold out the hope of cure in from one-third to one-half of the patients who are operated upon



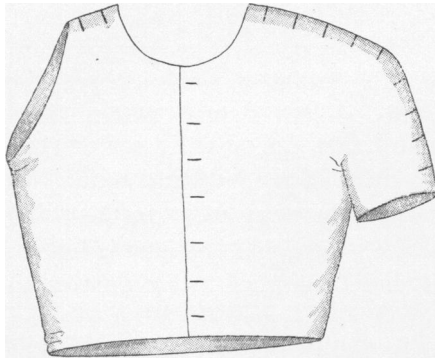
within a reasonably early time, and the mitigation of suffering and prolongation of life to those who are not cured. A thorough clearing out of an extensive operative region means very few local recurrences, but deaths from metastasis cannot be prevented in those patients in whom the disease has already spread beyond the operative field.

The extent to which this radical operation is an improvement upon former ones can only be proved when many series of cases so operated upon are observed for years. This has not yet been done; but among those mentioned in the table of good results above, Rotter and Helferich have operated by methods almost like the radical one here considered, and the others have been very thorough in removing suspicious tissue, and have often removed much of the pectoral muscle. It is interesting to note the improved results obtained by the individual operators as they have removed more and more tissue.

*The Immediate Effect of the Operation.*—Besides knowing the ultimate prognosis, one will wish to know the discomforts of the operation. Patients are usually surprised, after an operation, to find that they hardly suffer any pain. On the second day the head of the bed and with it the shoulders of the patient are usually elevated. On the third day solid and semisolid food are given, and the arm is loosened in its sling. The patient is usually out of bed a part of the time by the sixth or seventh day. Generally they leave the hospital some time in the third week. The average time of stay in the hospital for these patients has been twenty-two and three-sevenths days. The shortest time nine days. Twenty-one of the cases have healed by first intention; a large percentage, considering that nine of the patients had ulcers in the breast at the time of operation. Those who did not heal throughout by primary union had only slight granulation, usually situated where the skin did not cover the underlying tissue, or in one instance a slight undermining of the tissues at the margin of the wound.

The temperature has ordinarily been 100° to 101° F.

on the second or third day. The comfort of the first part of the time after operation and the rapid healing of the wounds have been promoted by the method of dressing. The skin flaps have been supported and held in close apposition to the chest wall by strips of rubber adhesive plaster, which have been firmly applied outside of the sterilized gauze which was laid immediately over the incision. Cotton outside of this was held firmly in place by a binder, which is similar to those used in obstetric practice, excepting that it has a sleeve. This is held firmly in position by safety-pins. It brings firm pressure on the wound where it is needed, and adds greatly to the comfort of the patient. It is easily applied and easily readjusted if too tight, or removed and repinned when dressing is necessary. The arm is supported in a sling which is pinned to this bandage. See illustration.



Dowd's binder for holding the dressing in position after operation for cancer of the breast.

#### HISTORIES OF CASES.

CASE I.—Mrs. T., aged forty-one years. Lump in right breast for four months, now the size of an English walnut, in upper outer quadrant of breast. No attachment to skin or fascia; no evident axillary involvement. Operation March 13, 1893 (Volkmann's). Healing by primary union. Highest temperature 101° F. Left hospital April 4, was delayed owing to an accidental burn at thigh. Pathological report: "Carcinoma, be-

ginning invasion of fat." Seen October 27, 1897. Has been in good health, and busily occupied during the four years and seven months which have elapsed since the operation. Normal use of arm.

CASE II.—Miss Q., aged sixty-two years. Lump in left breast for six months, now size of hen's egg, on upper outer quadrant. No attachment to skin or fascia; no evident axillary involvement. Volkmann's operation, June 23, 1893. Healing by primary union. Left hospital seventeen days after operation. Pathological report: Scirrhus. October 22, 1897: Has been seen frequently since operation. Says she can do more work now than ever before. Does her own house-work. Normal use of arm.

CASE III.—Mrs. P., aged thirty-nine years. Tumor in breast for four months; now size of walnut; upper outer quadrant. Axillary lymph-nodes enlarged. Volkmann's operation, August 14, 1894. Healing by primary union. Left hospital in nine days. Pathological report: Axillary lymph-node carcinomatous. The specimen from the breast which was examined adeno-fibromatous. About February 1, 1895, two or three small lymph-nodes were removed from axilla in another city. October 25, 1897: Patient in good health; normal use of arm. Has worked steadily and hard since operation.

CASE IV.—Mrs. S., aged thirty-four years. For eight months the growth has been progressing in upper outer part of right breast. Now the size of a half orange; not attached to skin or fascia; axilla involved. Volkmann's operation, September 1, 1894. Healing by primary union. Highest temperature 100° F. Left hospital in eleven days. Pathological report: Carcinoma involving glands. Patient progressed well until winter of 1896, when she began to fail, and died July, 1896. Had symptoms of intrathoracic cancer; sternal bulging; neuritis on right side of back. No local recurrence.

CASE V.—Mrs. N., aged thirty-seven years. Rapidly growing tumor in breast seven months; now nearly the entire breast involved. Attached to skin and fascia; axilla involved. Volkmann's operation, September 21, 1894. Skin graft. Healing by primary union and granulation. Left hospital in seventeen days. Highest temperature 100.8° F. Pathological report: Carcinoma; evidence of invasion of fat. Seen November 1: Had

a cough and sternal bulging. December 1: Died with symptoms of pulmonary growth.

CASE VI.—Mrs. D., aged forty years. Slowly growing lump in right breast for one and a half years; now the size of small orange; ulcerating and adherent to underlying structures; axilla involved. Volkmann's operation, November 16, 1894. Skin grafting. Healed by primary union, excepting slight granulation at margins of skin graft. Highest temperature 100.6° F. Left hospital in seventeen days. Pathological report: Carcinoma. Seen November, 1897: Has been seen from time to time since operation; had cedema of arm at first, which has disappeared; has very good use of arm; has done house-work regularly; has now a slight spot of induration at inner end of cicatrix.

CASE VII.—Mrs. E., aged forty years. Lump in upper outer part of breast for six months; now size of orange and adherent to skin and fascia. Halsted's operation, December 3, 1894. Healing by primary union. Highest temperature 100.6° F. In hospital thirty-eight days after operation. Delay caused by swelling of arm, which subsided. Pathological report: Carcinoma of breast and axillary glands. August 23, 1895, small recurrent nodule removed from split edge of pectoralis major. Died January, 1896, with symptoms of spinal metastasis. No further local recurrence.

CASE VIII.—Mrs. T., aged fifty years. A nodule has existed in lower outer part of left breast for thirty years. Patient has noticed rapid growth during last month. Now size of hen's egg, ulcerating; attached to skin and pectoral fascia; axilla involved. Halsted's operation, January 30, 1895. Skin graft. Healing by primary union. Left hospital in eighteen days. Highest temperature 100.4° F. Pathological report: Breast carcinoma. The axillary gland, which was examined, was not carcinomatous. November 29, 1896: Patient has worked hard since operation, and earns good wages as cook; has normal use of arm. Is perfectly well so far as she knows, but there is a freely movable, subcutaneous, axillary nodule size of bean. She refuses to have it removed. November 4, 1897: Has been well during past year. Went to Germany in the summer, and is now working as cook. Axillary nodule still present; has grown slightly.

CASE IX.—Mrs. M., aged fifty-six years. Nodule in right

breast for twelve years. Patient has noticed rapid growth two months. Now almost entire breast involved. Growth adherent to skin and pectoral fascia. Axilla much involved. Operation February 7, 1895. Volkmann's (only palliative operation deemed advisable on account of extensive growth). Skin graft. Healed by primary union. Highest temperature 100.6° F. Left hospital in fifteen days. Pathological report: Scirrhus carcinoma. Died October 28, 1895, from metastases in lungs and liver. No local recurrence. Had good use of arm.

CASE X.—Mrs. S., aged thirty-five years. Has had a lump in outer lower part of left breast for three years. It is now as large as a goose-egg and is ulcerating; axilla much involved. Halsted's operation, March 26, 1895. Large skin graft. Healing delayed by undermining of flap beside the graft. Highest temperature 102° F. Left hospital thirty-five days after operation. Pathological report: Tumor, first specimen adeno-fibroma with only traces of malignancy; second specimen shows more clearly carcinomatous nature. Axillary lymph-node; typical carcinoma. Died August 11, 1895, with symptoms of tumor in cervical spinal cord. No local recurrence. Had regained normal use of arm.

CASE XI.—Mrs. C., aged sixty-seven years. Growth in left breast for one and a half years. Now five inches in diameter. Attached to skin and pectoral fascia. Axilla much involved. Halsted's operation, April 8, 1895. Healing by primary union. Highest temperature 101.8° F. Left hospital in fourteen days. Pathological report: Breast, tumor, and gland carcinomatous. May 29, 1895: In good health; good use of arm; can put hand behind waist and above head. Died about December 1, 1895, with symptoms of spinal involvement. Site of operation in good condition.

CASE XII.—Mrs. C., aged fifty-one years. Itching about nipple for one year, with ulceration. Tumor in breast five weeks. Now tumor beneath nipple two inches in diameter; nipple almost gone; slight ulcer there. Halsted's operation, April 13, 1895. Healing by primary union. Highest temperature 100.8° F. Patient left hospital in nine days and resumed her work. Pathological report: Adenoma with evidence of commencing carcinoma. May 8, 1895: Patient in good health; good use of arm;

can put hand above head and behind waist. October 23, 1897: Patient has continued in good health.

CASE XIII.—Miss N., aged forty-two years. For two months has noticed a rapidly growing lump in right breast. Now, a hard growth three and a half by four inches in size occupies the upper part of the breast. It is adherent to the skin. The axilla is much involved. Halsted's operation, May 3, 1895. Healing by primary union. Highest temperature  $100.3^{\circ}$  F. Left hospital in eleven days, in good condition. Pathological report: The tumor is irregular in shape and infiltrates the surrounding tissues. Its centre is degenerated and broken down. Microscopically it is carcinoma, the lymph-nodes being extensively involved. July 8, 1895: Patient in good health and has good use of arm. September 20: Secondary operation for a recurrence which involved the axilla with a solid mass of cancerous material. January 12, 1896: Died.

CASE XIV.—Mrs. L., aged forty-five years. Noticed a lump in right breast seven months ago. It was partially excised five months ago, now breast hard and indurated. Axillary lymph-nodes enlarged. Halsted's operation, May 16, 1895. Wound healed well excepting for a sinus which led to a small piece of necrotic tissue just below the clavicle. Highest temperature  $101.2^{\circ}$  F. Patient in hospital thirty-three days after the operation. Pathological report: Breast and glands. The glands alone appear to be involved and are much enlarged. Microscopically they show carcinoma with areas of coagulation necrosis. In January, 1896, an exploratory incision was made on account of a suspicious hardening in the axilla, which, however, proved to be cicatricial and not cancerous. November 8, 1897: Patient in very good health; does her own house-work, and uses right arm in washing, ironing, and scrubbing.

CASE XV.—Mrs. G., aged sixty-five years. Has had tumor in breast for one year. It has grown steadily and is now badly ulcerated, and attached to deeper structures. Axilla much involved, and between breast and axilla there is a subcutaneous nodule the size of a horse-chestnut. May 25, 1895: Palliative Volkmann's operation done. Considerable surface left to granulate. Patient left hospital in thirty-four days. Highest temperature  $101.2^{\circ}$  F. Pathological report: Carcinoma of the scirrhus

variety. Patient lived a little more than a year after the operation. Had extensive recurrence on chest wall.

CASE XVI.—Miss B., aged thirty-six years. Lump in breast for two months. Now it is two and a half inches in diameter; not adherent to skin or pectoral fascia. The axillary lymph-nodes are enlarged. Halsted's operation, July 5, 1895. Healed by primary union. Highest temperature 100.4° F. Left hospital in twenty-one days. Pathological report: Carcinoma. In November, 1895, the other breast was removed for nodules which proved to be fibromata. October 23, 1897: Patient has had no sign of recurrence, is in good health, and does a "fair day's work," but has felt the depressing effect of her illness nervously.

CASE XVII.—Mrs. N., aged sixty-two years. Rapidly growing tumor in breast for one year. Now entire breast involved; large ulcerating places; firm attachment to pectoral fascia; axilla and lymph-nodes much enlarged. Halsted's operation, October 21, 1895. Healed by granulation. Highest temperature 100.4° F. Left hospital in thirty-one days. Patient died August 30, 1896, with extensive recurrence on chest wall.

CASE XVIII.—Mrs. X., aged forty-seven years. Lump in inner lower border of right breast for one year. Now two and a half by three and a half inches; skin adherent; axilla involved. Halsted's operation, January 27, 1896. Healed by primary union. Highest temperature 101.2° F. Left hospital in twenty-one days. November 1, 1897: Has been seen occasionally since operation. Has normal use of arm, and has better health than she has had for years. No recurrence.

CASE XIX.—Mrs. D., aged seventy-four years. Tumor in upper outer part of right breast for three months. Now size of hen's egg; not adherent to skin or pectoral fascia. Halsted's operation, May 11, 1896. At the time of the operation the tissues were found to be very flabby and soft. Pathological report: Carcinoma. Patient died two days later. The wound looked well, but streptococci were found in cultures from it and from the blood. It is believed that owing to her advanced age and poor resisting power she yielded to a degree of infection which would not have been serious in a younger person.

CASE XX.—Mrs. T., aged forty-five years. Five months' induration of left breast, which has grown very rapidly in last month; arm swollen two weeks. Now entire breast enlarged to

twice the size of the other. Skin over it inflamed. Antiphlogistic treatment was unavailing, and Halsted's operation was done June 25, 1896. Extensive skin graft. Healing by primary union, with slight granulation about the edges of the skin graft. Highest temperature 101.6° F. Left hospital in thirty-one days. Pathological report: Carcinoma with infection of axillary glands. Gram's stain showed no micro-organisms in the tissues. Patient died November 10, 1896, with extensive recurrence on chest wall.

CASE XXI.—Mrs. T., aged thirty-seven years. Lump in inner lower part of left breast for one and a half years. Now size of small orange, adherent to skin. Axilla involved. Halsted's operation, May 14, 1896. Skin graft. Healing by primary union. Highest temperature 100.4° F. Left hospital in eleven days. Pathological report: Carcinoma of breast and axillary lymph-nodes. Died October 18, 1897, with symptoms of spinal metastasis, which apparently started in lumbar vertebræ about a year earlier.

CASE XXII.—Mrs. O., aged fifty-five years. For one year tumor in outer lower part of left breast. Now size of goose-egg, adherent to skin. Nipple retracted. There has been a slight discharge from it for six weeks. Axilla much involved. Halsted's operation, June 15, 1896. Skin graft. Healed mostly by primary union with granulation in part of the skin grafted area. Highest temperature 100.2° F. Left hospital in forty-one days. Pathological report: Breast and lymph-nodes carcinomatous. December 9: Patient has small nodules scattered about the skin several inches from the incision. The skin is removed and the defect skin grafted. March, 1897: Died with spinal metastasis in lumbar region.

CASE XXIII.—Mrs. D., aged sixty-two years. Lump in upper inner part of right breast for six months. Now size of hen's egg. Halsted operation, September 28, 1896. Slight superficial suppuration. Left hospital in twenty-two days. Pathological report: Cystic structure, cysts containing gelatinous substance, within which are the remains of gland acini. In parts of sections there are masses of cells having malignant appearance. October 26, 1897: No recurrence. Patient in fair health.

CASE XXIV.—Mrs. H., aged fifty-four years. Lump in centre of breast for five months. Now size of hen's egg; not



adherent to skin or pectoral fascia. Axilla involved. Halsted's operation, February 15, 1897. Pectoralis minor also removed. Skin graft. Healing by primary union. Left hospital in seventeen days. Pathological report: Carcinoma. October 15, 1897: Working regularly; good use of arm. No recurrence.

CASE XXV.—Miss J., aged sixty years. Lump has been growing in left breast for one year and eight months. Now two-thirds of breast and axilla involved; ulceration present; growth attached to pectoral fascia. Halsted's operation, April 29, 1897. Pectoralis minor also removed. Healing by primary union, excepting where uncovered area granulated. Highest temperature 100.2° F. Left hospital in thirty-six days. Good use of arm. Pathological report: Carcinoma. November, 1897: Recurrent nodule in scar.

CASE XXVI.—Mrs. X., aged sixty-six years. For six months lump in middle of left breast, now size of hen's egg; adherent to skin. Axilla involved. Halsted's operation, June 28, 1897. Pectoralis minor removed. Healing by primary union. Left hospital in twenty-one days. Pathological report: Tumor, fibro-carcinoma; much fibrous tissue. Axillary lymph-node shows rapid infiltration. October 27, 1897: Patient in good health and working regularly. Good use of arm.

CASE XXVII.—Miss N., aged fifty-five years. Lump in outer upper part of right breast for four months. Now size of small orange; adherent to skin. Axilla involved. Halsted's operation, October 7, 1897. Pectoralis minor removed. Healed by primary union. Highest temperature 101° F. Left hospital in twenty-three days. Pathological report: Medullary carcinoma; vessels scanty. Tumor shows rapid degeneration at periphery. November 6: Good use of arm; can dress her own hair and pin her own skirt behind the waist.

CASE XXVIII.—Mrs. H., aged forty-two years. Has noticed a lump in breast for seven weeks. It is now as large as a hickory-nut, and attached to the skin. Palpable lymph-nodes in axilla and supraclavicular region. Halsted's operation, October 18, 1897. Pectoralis minor also removed. Supraclavicular lymph-nodes removed. Healed by primary union. Highest temperature 101.2° F. Left hospital in nineteen days. Pathological report: Carcinoma; axillary and supraclavicular lymph-nodes also carcinomatous

CASE XXIX.—Mrs. E., aged fifty-nine years. Lump in middle of left breast for two years. Now size of small orange; adherent to skin and deep structures. Axilla involved. Meyer's operation, November 1, 1897. Healing by primary union, excepting where a part of the skin margin sloughed and retracted. Highest temperature 101° F. Left hospital in thirty-four days. Pathological report: Carcinoma.