An Address

ON

THE OBJECTIONS TO THE INCOMPLETE OPERATION FOR CANCER OF THE BREAST.

DELIVERED BEFORE THE WORCESTERSHIRE AND
HEREFORDSHIRE BRANCH OF THE BRITISH
MEDICAL ASSOCIATION.

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I PROPOSE to draw attention to a matter of importance. Although so much has been said and written against inadequate operations for cancer of the breast, nevertheless they are still being done, and perhaps more often than is supposed. The ultimate results of these inadequate, incomplete operations are so forbidding that it is difficult to understand why they are being performed, especially as a much better and more scientific operation is available, and one which gives infinitely better results.

To-day a surgical operation is essentially the best remedy for cancer of the breast. Most of us have seen carcinoma disappear under the influence of x rays, and perhaps some may have seen it disappear under the influence of the rays of radium. But it is to be recollected that both of these kinds of rays are limited in their action. They can only act upon the cancer cells in the place where they impinge and penetrate, and do not affect cancer cells which are beyond their limited range of action and are in regions into which they do not go.

An ideal remedy for the cure of cancer of unknown dispersion would be one which we could introduce into the circulation and which would act from the centre to the periphery. Many attempts have been made, and are being made, to find a remedy of this description, and not, perhaps, entirely without some result.

Now it will be agreed that when an operation is done for cancer, it ought to be done with the clear and distinct intention of removing every particle of the cancer. The operation for cancer of the breast which is best calculated to take away every particle of growth is usually referred to as the "complete" operation, or sometimes as the "radical" operation.

The complete operation consists in the removal of the nipple and areola, together with an area of skin over the tumour, the whole of the mammary gland, both pectoral muscles, together with their fasciae, the costo-coracoid membrane, the fasciae over the anterior part of the serratus anterior, the upper part of the obliquus externus abdominis, the subscapularis, the teres major, and part of the latissimus dorsi, all the axillary fat, and all the lymph vessels and lymph glands therein; these come away in one piece with all the rest. Supplementary proceedings may be required, and it may be advisable to carry the dissection over the sternum or down the abdomen, or to ascend into the posterior triangle of the neck. These supplementary proceedings are usually required when the growth is of some duration, having been overlooked or neglected.

The inefficacious and uncommendable incomplete operation usually consists of an elliptical incision, including the nipple and areola, and a varying quantity of skin, the mammary gland, but not always in its entirety; the pectoral fascia, and the fat and lymph glands from the axilla, up to the pectoralis minor. This operation is rightly called the incomplete operation, because it almost invariably leaves growth in the axillary lymph glands and lymph vessels, not infrequently in the pectoralis major, in the skin, or in the fasciae of the chest and abdomen.

It is hardly necessary to say that this operation does not fulfil the conditions; it is not calculated to remove the whole of the cancer, and is therefore almost inevitably followed by a recurrence. I qualify the word "inevitable" and say "almost," because there are circumstances, which will be pointed out, in which it might occasionally cure the disease. The most that can be said for this inadequate and unscientific operation is that it is easy to do, and for a time may seem to give satisfactory results. The word

"recurrence" will be used rather frequently. By recurrence I do not mean that the cancer springs up again after every scrap of it has been taken away, but that it has gone on growing from the cancer which had been left behind. In this sense the word "recurrence" ought not in many instances to be applied to a cancer which after an operation appears in the opposite breast. When that occurs the growth is not always from cancer cells which have crossed the sternum.

Cancer cells which have travelled from one mammary gland to the other would presumably cause a cancer similar in type to the one from which they came, but very often these bilateral carcinomata are of dissimilar type. Also, there is often evidence of the existence of a predisposing cause in the form of a chronic mastitis. After operations for cancer of one breast the chances of a cancerous tumour growing in the other are rather high—at least one in twenty.

The inutility of the incomplete operation becomes manifest if we compare the steps of it with those of the complete operation, and consider the anatomical and pathological basis upon which the complete operation rests. The extent of that operation is determined by what is known about the passage of the cancer cells into the lymph system, the direction in which they spread within and without the breast. It is almost certain that as soon as a cancer has begun it sheds its cells into the lymph system. The breast is not favourable for observing this, but the tongue sometimes is. A woman had had a small ulcer on the side of the tongue for about three months. Although the growth was small and of short duration, cancer was found in the submaxillary lymph glands.

So that we assume that even the youngest cancer of the breast has shed its cells into the lymph system, and plan the operation so as to provide for that contingency. Unfortunately when once the cancer cells have entered the lymph system, there is no way of telling how far they may have reached nor in what direction they may have gone.

It is, however, safe to assume that they may have spread into the axillary lymph vessels and glands and, by way of the short circuit lymph vessels, into those about the upper end of the axillary vein beneath the pectoral muscles and costo-coracoid membrane.

The complete operation is devised to deal effectually with invasions of these lymph vessels and lymph glands which are not dealt with at all in the incomplete operation.

Keeping in mind, then, the way in which the cancer spreads into the lymph system, it is clear that an operation for cancer of the breast must remove the nipple and areola, so as to take away the whole of the subareolar plexus, which is the point of convergence of the lymph vessels of the lobes and lobules. The skin, too, soon becomes infected from the cancerous growth, because mammary lymph vessels reach it by passing along those little strands of connective tissue which pass from the mammary gland to the skin. So it is necessary, therefore, to remove a considerable area of skin over the growth. The incomplete operation in a measure fulfils these conditions. It removes the nipple and the areola and an area of skin, and it is intended to remove the whole of the mammary gland. I say "intended," because, with the very limited incisions I have seen made for these incomplete operations, it seems almost impracticable to remove such an extensive, irregular, and far-reaching structure.

After an incomplete operation it was seen, when the operation for recurrence was done, that a part of the mammary gland had not been removed. I suspected that some of the mammary gland had been left in two other incomplete operations, which had been done for duct carcinoma. The consequences of leaving part of the mammary gland are difficult to gauge. If that which has been left is chronically inflamed, there is always a chance of its becoming cancerous, just as a chronically inflamed tongue becomes cancerous; also the mammary gland may contain more than one carcinoma. In one case the left mammary gland had in it three separate foci of cancer, each surrounded by some fibrous tissue. In a case of malignant duct papilloma the growths were multiple, and although the duct carcinomata were small, the neighbouring axillary lymph glands had growth in them.

Recurrences after incomplete operations, as I shall show presently, are almost the rule, but local recurrences in the skin or in the scar are perhaps not so frequent as those in the axilla. I am quite certain that the local recurrences which I have seen after incomplete operations have been much worse than the local recurrences after complete operations. One of these cases of recurrence after an incomplete operation illustrates a point of much importance.

A surgeon performed an incomplete operation because the patient was suffering from what is sometimes called a duct carcinoma. This surgeon, I know, looked upon duct carcinoma as being a rather mild form of carcinoma—a most dangerous delusion, because duct carcinoma is just as malignant as any other form. The histology of the carcinoma ought to have no bearing upon the extent of the operation. The histological structure is often dissimilar in different parts of the same tumour. Some very good results have followed operations for spheroidal-celled and colloid carcinomata. Some think it a favourable sign if the growth contains much fibrous stroma and few cancer cells. But I have watched cases of this kind and some of them have ended very badly. The structure of a cancer has, I believe, a very small bearing upon the ultimate result. That depends far more upon the direction and upon the distance to which cancer cells have gone into the lymph system and into the venous system, and, of course, upon the range of the operation.

The incomplete operation removes the pectoral fascia but it does not take away the pectoralis major or the pectoralis minor. A cancer which is adherent to the pectoral fascia has certainly grown both into the pectoral fascia and into the pectoral muscle. But Stiles's method of examination often reveals unexpected strands of growth running back from the tumour to the pectoral fascia and onwards to the muscle. Histologists have, by using other methods, confirmed this observation; so that the removal of the pectoral muscle and pectoral fascia is a pathological necessity, and presently it will be seen that it is also an anatomical necessity.

Thrice after incomplete operations I have seen the growth recur in the great pectoral muscle. After the incomplete operation about 15 per cent. of the patients have recurrent growth in the great pectoral muscle, and this is quite sufficient to justify the removal of the muscle. I have never seen or heard of a recurrence in whatever remains of the great pectoral muscle after a complete operation.

In some cases there is some impairment of the utility of the arm after the complete operation, but I have been astonished to see, in the majority of cases, how very slight that impairment is. One who had had the left pectoral muscle removed in a complete operation plays golf quite well. The other day a patient who had had a complete operation done on the left side had been playing tennis, and, in the opinion of her friends, as well as before the operation. When the utility of the arm is interfered with too much skin has been taken away, or the skin has not been adjusted at the axilla so that the arm can be lifted from the side.

There is also a further anatomical reason for the removal of the pectoralis major and also of the pectoralis minor. The axillary lymph system is the main road by which the growth spreads from the mammary gland. Its progress is quick, and it may soon arrive in the lymph glands beneath the costo-coracoid membrane. The incomplete operation does not reach above the pectoralis minor, and therefore does not take away those high lymph glands. But the lymph vessels and glands beneath the costo-coracoid membrane may be infected through short-circuiting lymph vessels which run upwards from the mammary gland and pass between the two heads of the pectoralis major, or occasionally between the pectoralis major and the deltoid. By this short circuit the cancer cells pass at once to the highest lymph glands, where they remain undisturbed by the incomplete operation. It is obvious that no operation is complete which does not remove the uppermost lymph vessels and glands, and this cannot be done without the removal of the pectoralis major and minor, and of the costo-coracoid membrane.

It is probable that cancer cells often travel by the short circuit into the highest glands. Sometimes during the operation one sees that although there is little carcinoma in the lower axillary lymph glands, nevertheless there is much in those high up. This was found in a case of

malignant cyst papilloma. A single lymph gland with growth in it was dissected from beneath the upper end of the axillary vein. I am informed that eighteen months after the patient died of cancer. The prognosis is not favourable when the growth has reached so high. These carcinomatous glands beneath the costo-coracoid membrane cannot be detected by clinical methods. It is safer to assume the possibility of their presence and make a thorough dissection, and that can only be made by removing the pectoralis major and minor and the costo-coracoid membrane.

The descriptions of the axillary lymph vessels and lymph glands in anatomical treatises are elaborate beyond the needs of surgery. In general the veins, which stand out so well during the operation, are a sufficient guide to the lymph vessels and to the lymph glands along their course. In performing the complete operation the smaller veins are taken away, and the great axillary vein cleanly dissected. This, together with the removal of the fasciae, ensures the total ablation of the lymph vessels and lymph glands and offers an additional safeguard against recurrence. Cancer cells pass along the veins as well as along the lymph vessels, hence the appearance of growths in the bones far from the original tumour.

It is not safe to suppose that the axillary lymph vessels and glands are only situated below the axillary vein, or below and in front of the axillary vein. Some may be situated behind and some above it.

Those lymph vessels and glands above the axillary vein are to be especially reckoned with, for they may be a deadly pitfall. After the complete operation recurrences do not take place in any small remains of the pectoral muscles, nor in the axilla. The commonest place for recurrence is in the lymph glands in the posterior triangle of the neck, and more especially in those in its outer angle beneath the trapezius. Now those lymph vessels and lymph glands are in direct communication with and a continuation upwards of those situated above the axillary vein.

Needless to say, the lymph vessels and lymph glands above the axillary vein must be dissected out as well as the others, and this necessitates the thorough cleaning of that great vein from beginning to end. But this dissection is impossible without the removal of the pectoral muscles, including the clavicular head of the pectoralis major.

In the incomplete operation no attempt whatever is made to take away any of the lymph vessels and lymph glands about the upper end of the axillary vein—neither those below, nor in front, nor behind, nor those which run above it. Nevertheless, as I have pointed out, owing to the short circuits of the lymph systems these lymph vessels and lymph glands about the upper end of the axillary vein are especially liable to become cancerous.

The dissection of the axilla in the incomplete operation is most unsatisfactory. A crude attempt is made to clear out enlarged glands from its lower part, but this attempt does not reach higher than the pectoralis minor. The possibility of the presence of cancer in the lymph vessels amidst the axillary fat, and in microscopic islets of lymphoid tissue, and in those lymph vessels which run upon the fasciae, is ignored. For these to be taken away it is necessary to dissect the fascial coverings from off the muscles which bound the axilla, and from off the side of the chest.

I have notes of 25 cases of recurrence after incomplete operations done by myself and other surgeons. Nobody will be surprised to hear, after what I have said, that 19 out of the 25 were in the axilla. In addition many of the patients had other growths in the skin, in the skin and scar, in the posterior triangle of the neck, and elsewhere. The recurrences in the pectoralis major are a black mark against the incomplete operation, but these in the axilla are enough to condemn it altogether.

Perhaps it may be thought that the mortality of the incomplete operation is less than that of the complete. When, some years ago, I performed the incomplete operation the mortality was rather high, probably about 5 per cent., but some of the operations were only done to get rid of ulcerated growths.

I have done 137 complete operations and no patient has yet died. Although the shock for the first twenty-four hours may have been considerable, yet those women recovered in the most remarkable way.

Now there is, as I have said, only one condition under which an incomplete operation might cure the cancer, namely, when the carcinoma is confined to the mammary gland, and has not yet infected the lymph vessels or lymph glands. I have notes of 7 cases in which the cancer was in the substance of the mammary gland and had not infected the lymph system. All of these patients had the complete operation performed, and are alive and well after the lapse of

Over 12 years	...	...	...	...	2
Over 10 years	...	...	...	...	1
Over 7 years	...	...	...	...	2
Over 6 years	...	...	...	...	1
Over 5 years	...	...	...	...	1

Eight cancers in seven patients, because one patient is well more than seven years after the complete operation on the left side and more than five years after the complete operation on the right.

More of these satisfactory cases will be forthcoming when the fallacies of clinical diagnosis are recognized, and when tumours of the breast are submitted to an immediate histological examination. The longest period of life that I know of after an incomplete operation done by myself has been seven years, and I doubt whether any that I ever did has escaped recurrence.

A Report of the Work

CARRIED OUT AT

THE RADIIUM INSTITUTE, LONDON, IN 1913.

BY

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MEDICAL SUPERINTENDENT.

(Published with the authority of the Committee.)

This report deals with the cases which have presented themselves at the Radium Institute from January 1st, 1913, to December 31st, 1913, inclusive.

The experiences of the past year tend on the whole to confirm the conclusions set forth in the report of the first seventeen months' work, published in the *BRITISH MEDICAL JOURNAL* of January 25th, 1913, p. 149; but some few additional facts have been noticed, which serve to increase our knowledge in respect of the prognosis and treatment of various diseases.

TABLE I.—Summary of Cases.

Examined, but not treated	...	...	...	...	112
Recently treated, and results not yet noted	...	...	...	...	176
Received prophylactic irradiation only	...	...	...	...	30
Apparently cured	...	...	...	...	56
Cured	...	...	...	...	18
Improved	...	...	...	...	341
Not improved	...	...	...	...	152
Abandoned treatment	...	...	...	...	50
Dead	...	...	...	...	37

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EPITHELIOMA.

The results obtained in the treatment of epitheliomata affecting glabrous surfaces call for no fresh comment, and in suitable instances removal of the growth by radium may be confidently anticipated.

Epitheliomata of the buccal, lingual, and pharyngeal mucous membranes still prove both refractory and disappointing in their response to radium, but a new method of treatment has recently been devised, which in instances of cancer of the tongue has given distinctly encouraging results; it consists in the burying within the carcinomatous nodule of a very small but intensely powerful radium emanation tube possessing an initial activity equivalent to that of 80 to 100 mg. of radium bromide enveloped in a screen of 1 mm. of silver or 0.3 mm. of platinum, and giving an exposure of twenty-four hours' duration. A fairly severe reaction follows, and in some cases the nodule ceases to grow and becomes replaced by dense fibrous tissue.

Several cases of epithelioma of the oesophagus have been under treatment, but unfortunately the majority of these have been in so advanced a stage as to preclude all hope of success. In those instances, however, in which complete occlusion had not occurred, and it was possible to introduce radium actually into the lumen of the

growth, distinct, though temporary, benefit has resulted, and that this effect is not merely mechanical, due to the dilatation of the stricture by the apparatus, is evidenced by the fact that the improvement in the power of swallowing has persisted for six or even nine months after the termination of the treatment.

CARCINOMA.

Carcinoma of the Uterus.

Uterine cancer still continues to yield most gratifying results, and the effects of radium treatment in inoperable cases are far in advance of those obtained by any other known medical or surgical methods. The local manifestations of the disease are benefited in the most striking fashion, and the complete disappearance of fungating growth, arrest of haemorrhage and discharge, healing of ulceration and relief from pain are phenomena of almost daily occurrence. In favourable cases, moreover, the treatment appears to exert a distinctly retarding influence on the dissemination of deposits, and thus to arrest the progress of the disease. It is not possible, however, to speak of "cure" even in these latter instances.

Great care must be exercised in the treatment of recurrences, which make their appearance within six months of the performance of a Wertheim's operation. The functions of the trophic nerves of the pelvis seem often to be seriously impaired by the extensive and elaborate dissection which is associated with this method of hysterectomy, and for this reason the amount of radium used should be small, not exceeding 50 mg., the screening not less than 1.5 mg. of lead, and the total exposure not longer than twenty hours spread over four or five days. Unless these precautions be observed a severe and extensive destructive reaction may follow the application of radium.

In all cases in which radium has been applied within the vagina the patient should be instructed to douche freely night and morning for at least six weeks after the termination of the treatment; as unless this be done an adhesive vaginitis not infrequently occurs. In some extremely susceptible subjects a transient proctitis has been noted to follow upon intravaginal treatment.

The screening employed in cases of carcinoma of the uterus is either 1 mm. of silver or 2 mm. of lead, but the thinner screening should only be adopted when the cervical canal is patulous and the tube can be introduced into its cavity.

Carcinoma of the Breast.

The number of patients with this disease applying for treatment far exceeds that of any other malignant condition.

The policy of declining to treat operable cases is still rigidly adhered to—unless the patients have absolutely refused to submit to operation—and radium is used as a last resource.

Many patients exhibit a great susceptibility to radium; the primary growth becomes smaller, infected glands and subcutaneous nodules lessen or perhaps even disappear. Little or no effect appears to be exerted in the prevention of metastatic deposits, though the treatment does not, at any rate, hasten their dissemination. Some cases in which pleurisy, dependent upon carcinomatous invasion of the pleura, has been present have shown remarkable improvement, and the application of powerful apparatus screened with 2 mm. of lead over the affected pleura, after a preliminary paracentesis, has effectually prevented the further formation of pleuritic effusion.

A few patients have been under treatment at intervals of three or four months since the opening of the institute in September, 1911, and it has been noted that a stage in their treatment is reached sooner or later at which the response to radium fails, and the benefit derived becomes negligible.

Small isolated recurrent nodules, inoperable by reason of their attachment to the sternum, clavicle, ribs, or rib cartilages, are best treated by burying a small powerful emanation tube screened with 1 mm. of silver in them for a period of twenty-four hours.

Carcinoma of Thyroid.

Encouraging results have been obtained in the few instances that have come under notice, the progress of the disease has been arrested, and a decrease in the size of the