

Cancer of the Breast

I. Operative Treatment

NZMJ, 1923

In this paper I propose to deal briefly with the operative treatment of cancer of the breast. I am taking it for granted that in the present state of our knowledge and experience the radical operation gives the victims of cancer of the breast the best chance of permanent cure, that is, in what may be called operable cases. The paper will also include the procedure to be adopted in doubtful cases, as well as palliative operations and the treatment of recurrence.

I do not propose to enter into any details of surgical anatomy beyond dwelling for a short time on the lymphatic circulation. *Handley's* permeation theory is largely responsible for the details of the modern operation and it will not be waste of time to recapitulate it.

The lymphatics of the breast run for the most part into the plexus on the deep fascia over the pectoralis major. This plexus, in the words of *Handley*, "is really a conventional subdivision of the deep fascial lymphatic plexus whose network of inter-communication channels invests the entire body. This great plexus is divisible by the median plane of the body, and by two horizontal planes, passing through the clavicles, and through the umbilicus respectively, into six catchment areas, three on either side, draining, as the case may be, into the cervical, the axillary, or the inguinal glands. Within each area a set of special trunk lymphatics arises from the plexus and converges on the corresponding set of glands. The line, or rather zone, separating any two adjacent areas may be called the lymphatics water-parting, and is anatomically a zone of narrow tortuous channels nowhere traversed by trunk lymphatics, a region consequently where the lymph stream is at its feeblest and where even very fine particles are liable to be arrested.

"The general idea, then, which we have obtained of the parietal lymphatic system is that of a vast horizontal network of the channels co-extensive with the surface of the body and receiving above, numberless fine vertical tributaries which convey to it must include the breast. On its deep aspect the plexus receives tributaries from the subjacent tissues. From this great plexus, which lies in the

subcutaneous fat upon the deep fascia, the lymph is conveyed by six set of lymphatic trunks each draining a definite area to the cervical, axillary, or the inguinal glands."

The lymphatics of the breast, then, run mainly via the pectoral fascia into the axillary glands, but the anastomosis we have been describing brings them into close communication with the lymphatics of the opposite breast and the opposite pectoral fascia, and by that means with the opposite axilla.

In all probability some lymphatics run direct to the supraclavicular glands, others, following the main blood supply of the breast, run with the perforating branches of the internal mammary artery to the anterior mediastinum, joining the few glands situated there. Of much more importance is the close connection which occurs between the superficial lymphatics on the one hand and those of the thorax and abdomen on the other, which occurs in the neighbourhood of the umbilicus and epigastric notch.

So much for the lymphatic circulation. *Handley* summarises his conclusions about the spread of cancer as follows:—"Dissemination is usually accomplished by the actual growth of cancer cells along the finer vessels of the lymphatic plexuses—permeation. Embolic invasion of the regional lymphatic glands, though it almost invariably occurs, only leads to the invasion of the blood stream after a long delay, and the work of M. B. Schmidt shows that cancer cells which reach the blood usually disappear without giving rise to metastases. Permeation takes place almost as readily against the lymph stream as with it. It spreads through the lymphatic vessels around the primary neoplasm in much the same way as would a thick injection fluid introduced into the tissues by a syringe.

"The disappearance of permeated lymphatics in the area which intervenes between the annular microscopic growing edge and the primary neoplasm is due to the destruction after a time of the cancerous permeated lymphatics by the defensive process of 'perilymphatic fibrosis.' The recognition of this process at once removes the difficulty

that permeated lymphatics are absent in the region immediately surrounding the naked eye primary growth. Cancer thus spreads in the parietal tissues by permeating the lymphatic system like an annular ringworm. The growing edge extends like a ripple in a wider and wider circle within whose circumference healing processes take place so that the area of permeation at any one time is not a disc but a ring. The spread of cancer in the parietal tissues is in fact as truly a serpiginous process as the most typical tertiary syphilide. But in the case of cancer the spreading edge is invisible; and, moreover, the advancing growing microscopic edge of a cancer, owing to the failure at isolated points of the defensive process of perilymphatic fibrosis, may leave in its track here and there isolated secondary foci which give rise to macroscopic metastases. Such nodules, in spite of their apparent isolation, arise in continuity with the primary growth, but perilymphatic fibrosis has destroyed the permeated lymphatics which formed the lines of communication."

Hence the necessity for the wide removal of the deep fascia. Whether or not the invasion of the axillary glands is the starting point for further spread is a debateable point. *Sistrunk* has shown in a careful analysis of the results of 218 operations for cancer of the breast at the *Mayo Clinic* during the years 1911-12-13, that 80 per cent. of those showing local recurrences has been proved to have invasion of the axillary glands at the time of original operation. It may well be that the involvement of the axillary glands is only another indication of the widespread dissemination which has already occurred along the peripheral lymphatic plexus. The prognosis in these cases is bad. *Sistrunk* shows that the large majority of them are dead within five years.

Diagnosis is not included in my contribution to this discussion, but I should like to enter a plea for the necessity of at once coming to a decision. It cannot be too often or too emphatically stated that no palpable tumour of the breast should be watched. If the diagnosis is uncertain, the sooner it is made certain the better, and at present the only way to do that is to operate on it. The mortality from cancer of the breast is still too high, even though there has been a slight improvement of late years. The ignorance of the public is partly responsible. Many cases of cancer are painless until a late stage. We shall have to keep on educating the public until at least it will not be the patient's fault if she does not have her operation done at the earliest possible moment.

I am afraid we are sometimes to blame for the delay ourselves. We make mistakes in diagnosis. These mistakes do not matter if the treatment is to be exploratory, but if, being uncertain, our advice is to wait and see, we incur a very grave responsibility. We may bitterly repent giving that advice later on. At the same time accurate diagnosis is difficult. *McCarty*, in an analysis of 1373 cases of cancer and mastitis, found that mastitis was correctly diagnosed in 37 per cent. In 63 per cent. the diagnosis depended on the microscope. Similarly there was a clinical diagnosis of involvement of the axillary glands in 325 cases. Of these only 37 per cent. proved to be actually carcinomatous.

There are some factors which are beyond our control in this cancer business. Amongst them is the question of virulence. We must have all met with cases which seemed early, in which the most careful and thorough operation was performed, and yet which quickly recurred and led to the early death of the victim. On the other hand details of many cases have been published which have been regarded as almost inoperable, but yet palliative or incomplete operations have been done with the result that the patients have been given many years of comparative health.

In the treatment of doubtful cases there is need for the close association of the surgeon and surgical pathologist. I do not know how often in our large centres fresh tissue is examined microscopically during the operation. I have noted the want of it in Timaru on more than one occasion. We cannot help lessening the patient's chances if we remove a piece of growth and send it away to a distance for a pathologist's report. No matter what you do, cauterize the wound with a red hot poker, sew the edges ever so carefully, there must be a flush of blood to the damaged area which carries with it an increased lymph flow. The problem in the large centres is not so difficult as it is for the smaller ones. There was hope that in Timaru we should have organised our hospital service so as to include a pathologist. Instead, the South Canterbury Hospital Board has seen fit to dispense with the services of its honorary staff and to carry on the hospital as a one-man show. Other hospital boards may follow suit.

It ought not to be difficult, if we could only combine a little more and limit the number of private hospitals and concentrate on one good one in each town which would have facilities for elementary pathological work and radiological

treatment if necessary. There would probably not be room for a resident pathologist, but it would be quite possible for one or two of the practitioners to acquire sufficient skill in cutting frozen sections and in coming to a sufficiently accurate idea as to the diagnosis.

McCarty, from the standpoint of the surgical pathologist, as one who is well acquainted with the activities of both surgeon and surgical pathologist, advises the following procedure:—

1. The condition in the breast which is associated with classical signs of carcinoma should be treated radically.
2. In doubtful cases, in women *near or over* 35, the entire mammary gland should be removed for immediate examination. If the primary or secondary hyperplasia be present nothing more should be done. If tertiary hyperplasia be present, a radical operation should be performed.
3. In doubtful cases *near or under* 35 years of age, a wide sector of the mammary gland, including the pathological conditions, should be removed for examination. If primary hyperplasia be present nothing more should be done. If secondary hyperplasia be present the rest of the mammary gland should be removed, and if tertiary hyperplasia be present the radical operation should be accomplished.

In not a few tumours of the breast the lump turns out to be a cyst. True the cyst often contains a papilloma and such papillomata are often malignant. Cyst formation is a fortunate occurrence. Some of the earliest cases of cancer observed have been associated with cyst formation. In any doubtful case I see no reason why a hypodermic needle should not be used *at the operation* to determine whether fluid is present or not. If the fluid is serous you will probably be safe in removing a wide sector of the breast and submitting it to microscopic examination. If it is hæmorrhagic, and you have no pathologist present to advise you, it will be better to do the radical operation.

Cheatle removes the doubtful breast through a transverse convex incision below the nipple. The incision is extended into the axilla and the principal glands are removed, but a complete clearance is not done unless the microscope shows malignancy. He leaves the nipple for sentimental reasons, a step of doubtful utility.

The skin is dissected up above and below, the nipple being carefully dissected out. The breast is then removed, together with the pectoral fascia and the main glands of the axilla. If the nipple is not conserved two elliptical incisions enclosing the nipple will give the best access. There will be no difficulty in getting the flaps together.

Another method, described in an article by *Fitzwilliams* in the *British Medical Journal* for the 20th Jan., 1923, attacks the tumour from the deep aspect of the breast. An incision is made along the circumference of the breast on the lower and outer sides, extending about half-way round and going at once down to the muscles. The breast is then lifted up and the deep surface exposed. The whole of it can be removed in this way or a sector large enough to contain the part to be examined.

Into all the questions which centre round the radical operation for the removal of a malignant growth it will be impossible for me to enter in the short time at my disposal. I shall content myself with indicating certain principles and describe the procedure which has seemed to me to promise the best results. I can speak of it from my own experience.

The popular idea of cancer with its roots going deeply into the surrounding tissues has much to justify it. We have to endeavour to remove that growth in a bag, and in doing so we have to close the neck of the bag first and then carefully turn up the edges all round, realising that the bag is to be a big one and is never to be opened anywhere so that not a single particle of the contents escapes. Unfortunately for us and our victims the roots are invisible. We can only do our best.

Handley's ideal skin to be removed must be the minimum. A circular area centred on the growth, not on the nipple, with a diameter of four to five inches. No consideration of difficulty in closing the wound to be allowed to interfere. Very much more important still is the area of deep fascia to be removed. This can scarcely be too wide. If *Handley* is right, and it is difficult to disprove his idea, this is where the growing edge is. We must get outside of it at all costs if we want to overtake the disease and arrest it before it causes fatal metastases.

There are numerous incisions described. The essentials are the circular area to be removed, a linear incision from its lower edge down to the mid-line or across it in the epigastric region, and an upward incision, which should not run along the anterior axilla fold but which may mark out a

flap to give access to the axilla. Whatever incision is chosen should be lightly marked out as this is the first step of the operation.

Next, the upper part of the incision is deepened, reflecting the skin with a thin layer of fat until the clavicle is reached above and internally, and the latissimus dorsi is well exposed behind.

A little dissection soon exposes the tendon of the pectoralis major, which is divided close to its insertion. Its upper edge is then cleared, taking care not to damage the cephalic vein, and its clavicular attachment divided, after which the muscle is turned downwards and inwards. I believe it is better to take away the whole of the pectoralis major. Access to the axilla is much improved and the functional results are quite good as those in which the clavicular fibres have been left.

The fascia over the coraco-brachialis is next incised up to the coracoid process, and the tendon of the pectoralis minor divided after hooking the finger under it. By attaching catch forceps to the divided fascia and tendon of the pectoralis minor it is possible to clear the axillary vessels and brachial plexus with very little trouble. Gentle traction on the forceps helps considerably, and by working behind the fascia with a pair of *Mayo's* scissors one is keeping outside the bag in which the tumour lies. The same principle is followed in separating the fascia over the latissimus dorsi from its dorsal to its ventral surface, and this is succeeded by that over the subscapularis muscle, and finally that over the upper part of the serratus magnus. It is important to save the long subscapular and long thoracic nerves, and when they are exposed they are dissected out and the fascia passed under them. The axilla is by this time completely cleared. Only the two nerves saved and the axillary vessels and brachial plexus remain as the contents of the space. A gauze pack is put into the axilla whilst the axillary fat and glands are wrapped in another to prevent soiling of the wound.

Turning now to the breast, the previously marked out incisions are deepened, the knife lateralized and the skin reflected with a thin layer of fat until the opposite border of the sternum is reached internally and well beyond the epigastric triangle below. The skin flaps are everywhere wrapped in warm cloths to protect their vitality.

The deep fascia is now incised along the opposite margin of the sternum, and, putting the breast and axillary tissues gently on the stretch, the fascia is raised, taking with it the origins of the pectoralis major and minor muscles working from above down and out. Perforating branches of the arteries are caught before being cut if possible. The rectus sheath on both sides is incised and raised, followed by the fascia over the external oblique muscle. Finally the fascia over the rest of the serratus magnus remains to be separated and the tumour is free. Time is of less importance than loss of blood, and it is worth while to stop as much bleeding as possible.

As a rule the skin edges come together without much difficulty. It is better to have a sinuous or triradiate scar than a linear one. Drainage is provided by a stab puncture through the lowest angle of the wound. The arm is fixed to the side. A large gauze dressing is placed in the axilla and another pad under the clavicle. It is important to obliterate the dead space there and prevent accumulation of serum, and to get the flaps to adhere at once to the underlying chest wall. This is secured by adequate dressing, gentle pressure by bandage, and above all by preventing all movement of the arm for some days. No advantage is gained by putting the arm up in the abducted position.

Such is the radical operation. Burying radium tubes at the danger points, as described by *Handley*, is beyond the range of most of us. Unless there are palpable supra-clavicle glands it would seem that it is unnecessary to interfere with them at this time. As soon as possible after the operation X-ray treatment should be begun. In the ideal private hospitals I have visualised the X-ray plant will be on the spot. At present we have to wait in many cases until the patient is convalescent.

I have been much troubled with sloughing of the edges of the flaps. Perhaps some one can tell us how it is to be avoided. It causes an unfortunate delay in convalescence and may lead to some adhesion of the skin to the chest wall, thereby hampering movements.*

(*Of the many descriptions of the operation that by *Lyle* in *Johnson's Operative Therapeutics* is, I think, the best.)