An Address ON CARCINOMA OF THE BREAST, AND ITS SPREAD INTO THE LYMPHATICS.

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By CHARLES BARRETT LOCKWOOD, F.R.C.S.,
SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

IN spite of all the good work that has been done by anatomists, pathologists, and surgeons, I have, during the course of many operations for cancer of the breast, met with much that has not been explained. It is to be feared that we may not hope for clear light until the etiology of cancer is known. But, in the meantime, each addition to our knowledge of the manner in which cancer of the breast spreads adds to the efficiency of operations done for its extirpation.

Without this knowledge it is difficult to see how a complete removal can be accomplished. The spread of cancer along the lymphatics is, however, an erratic and complicated process, and I propose to tell you of the things which I have noticed. I think you will agree that some of them ought not to be dismissed without at least a passing thought.

VARIATIONS IN RAPIDITY.

The rapidity with which cancer spreads into the lymphatics depends to a large extent upon the position of the primary growth. When that is situated within a hollow muscular organ such as the urinary bladder, or gall bladder, the pause may be a long one—months or even years. But when the growth is in the mammary gland, which has no capsule, or the tongue, or in the pharynx, there is, I believe, hardly any interval of time between the onset of the growth and its spread into the neighbouring lymphatics.

For many years I have noted down the condition of the lymphatics whenever operating in malignant disease, and the above is not, I venture to think, an over-statement of the case. Some of the operations, too, have been done at unusually early stages, because, as I have said elsewhere,¹ it is my habit to make an immediate microscopical examination of suspicious tumours. In this way many are, of course, met with at their very earliest appearance, and even then the lymphatics have been involved.

For instance, a female had a small indurated ulcer of the left nipple. The ulcer looked and felt like a small Hunterian sore, but proved on microscopical examination to be cancerous. No enlargement of the axillary lymphatic glands could be seen or felt. After the whole mammary gland and both pectoral muscles had been removed, several enlarged lymphatic glands were found; the largest one was highest up, and adherent to the upper part of the axillary vein. It would not have been seen had the pectorals not been removed.* To those who have not realized how soon and how extensively the lymphatics become involved even in the earliest stages of malignant disease, the removal of the whole mammary gland, both of the pectoral muscles, and all the axillary fat and fascia may seem to have been an extensive procedure to adopt for a small carcinomatous ulcer of the nipple; and yet the end justified the means.

Here is another instance in which a very minute cancer was proved to be accompanied by rather extensive growth in the neighbouring lymphatics. A woman came complaining of occasional slight mucous discharge from the right nipple, which was slightly retracted. The whole of the right breast was larger than the left, but nothing unusual could be felt in it, except at the lower part of the areola. Here a very small soft nodule could with difficulty be felt. Slight pressure made this insignificant lump almost disappear, with the escape of a little mucus from the nipple. An incision brought to light a dilated duct ampulla, and the microscope there and then showed that it contained small carcinoma. The little sac which held the growth

was not more than $\frac{1}{4}$ in. long and not much more than $\frac{1}{4}$ in. across its widest part. The minute growth projected into this from a small area of its wall.

The whole of the mammary gland and the pectoral fascia were then removed. A subsequent microscopical examination showed that this was necessary because—as I suspected—the gland contained other commencing duct carcinomata, although none could be seen with the naked eye. The tumour beneath the areola—the only one which was known to exist when the operation was done—seemed too small and too immature to have yet spread into the neighbouring lymphatic glands; besides, it was enclosed within the walls of the ampulla. Nevertheless, the axilla was explored, although no enlargement of its lymphatic glands could be seen or felt. Rather to my surprise, several enlarged ones were met with, and the microscope there and then revealed that they contained duct carcinoma. I removed as much of the axillary fat and lymphatic glands as could be done without taking the pectorals away. But on consideration, I regret now that those muscles were not removed. Without that step it is impossible to reach the lymphatic glands about the uppermost part of the axillary vein. These, as I shall presently describe, may become cancerous as soon as, or sooner than, those lower down. Thus, in the smallest carcinoma of the breast that I have ever seen, the neighbouring lymphatics were already cancerous. They probably had in them deposits which taken together equalled or exceeded in quantity the parent growth.

I believe that there is an idea abroad that these duct cancers are less malignant than the other kinds, which oftener grow in the breast. But my own clinical and pathological experience leads me to think that that is a dangerous delusion. For instance, a woman had a small duct carcinoma of the right breast. This, together with a part of the mammary gland, was removed by a surgeon, who considered that he was dealing with a favourable form of carcinoma. Two years later a recurrence necessitated the removal of the remainder of the breast, together with a part of two ribs and the subjacent pleura. The large gap was closed by bringing up a flap from the abdomen. The patient bore this severe operation very well indeed, and the pneumothorax must have departed in a very short time. This case had a curious sequel, for three months later a nodule of colloid carcinoma appeared in the left breast, which I removed, and afterwards there was reason to suppose that the right pleura was affected. Or, again, a part only of the right breast was removed in a London hospital for a duct carcinoma. Three years afterwards I had to do a complete operation for an extensive growth.

Further, another woman, upon whom I had done an extensive operation for duct carcinoma of the left breast, had a recurrence eight years afterwards in and about the scar. This has been called a recurrence, but in most cases it is more rational to say that the cancer left behind went on growing. Perhaps some think that duct cancer is more favourable, simply because it is removed earlier than other kinds. The sanious discharge from the nipple alarms the most careless, and impels them to seek advice.

Another instance shows not only that the lymphatics are involved at the earliest stages of cancer of the breast, but also that the growths in them may soon grow bigger than the one from which they sprung. A woman had a small, hard, movable nodule beneath the lower margin of the left areola. It was explored, and found to be a carcinoma. The nodule was barely half an inch across, but it sent out small prolongations. Some fullness could be seen in the axilla, and moderately enlarged glands could be felt beneath the great pectoral muscles. But when the breast and pectoral muscles had been removed a very large mass of cancerous glands was unexpectedly met with.

Such cases as these prove that from the earliest beginnings of cancer of the breast the disease has attacked the lymphatics. Although I have for a long time looked upon a carcinoma as a sort of lymphatic sponge with cancer cells growing in its meshes, yet the early spread into the surrounding lymphatics did not become clear to me until I had begun to make immediate microscopical examinations of even the smallest and most innocent-looking tumours of the breast, and to follow this up by a similar investigation of the neighbouring lymphatics. I am now

* On this point see also Sheild: The Results of Operation in 60 Cases of Malignant Disease of the Breast. *Lancet*, March 8th, 1902, p. 643.

aware that in no other way can the earliest stages of cancer of the breast be detected. The ordinary attempts at guessing usually succeed in advanced cases, but in the early ones lead to error, delay, and incomplete operations. An instance, which I have mentioned elsewhere, made a profound impression upon my mind.² A young woman, aged 29, was assumed to have a small chronic mammary tumour. This was removed and the microscope revealed that it was a cancer. Then a fresh operation had to be undertaken and, as had been suspected, cancer was found in the breast near the scar tissue of the original operation. The axillary lymphatics were also enlarged, but contained no visible carcinoma. Such instances cannot be very uncommon. I am acquainted with two exactly similar ones, and in which an immediate microscopical examination would have saved the anxiety and distress of a second operation.

The method is so easy and accurate that I wonder it is not more frequently practised. An anaesthetic, an incision, removal of the small tumour, a frozen section stained with an aniline dye, and within from five to ten minutes a scientific—that is to say, a certain—diagnosis. Should the small tumour happily prove to be innocuous, the end is a limited incision, a small scar; but should it prove malignant, then a thorough operation can be done forthwith. The operator having seen the dread disease with scientific certainty, is nerved for a long and arduous toil, for it is requisite to take away the entire mammary gland, the pectoral muscles and their fasciae, the axillary fat and lymphatics, and the axillary fasciae.

THE MANNER.

Having discussed the time, let us now turn to the manner in which the lymphatics become involved in cancer of the breast. The presence of growths in the lymphatic vessels themselves cannot be seen during operations, except occasionally, in very advanced cases. More than once in neglected ones, and upon which I have been reluctantly compelled to operate, I have seen small, hard, white, knotted strings running through the intercostal spaces towards the anterior mediastinum. But, ordinarily, the lymphatics are removed along with the muscles, fasciae, and fat, and without any macroscopic evidence of cancer within their channels. Afterwards microscopic evidence of its presence may be, and often has been, obtained.

We turn, therefore, to the effects of the carcinoma upon the glands along the course of the lymphatics. Probably the first and most obvious effect produced is enlargement. Now, there is to my mind something very strange about this enlargement. I have over and over again chosen the largest from a group of enlarged axillary glands from a case of cancer of the breast, and have failed to identify cancerous cells or structures within its capsule, and this is quite an ordinary experience. It has been recorded by Stiles³ in his admirable essay. My colleague, Dr. F. W. Andrewes, one of the most accurate of pathologists, allows me to say that he quite agrees that in cancer of the breast the axillary glands are sometimes enlarged without showing any microscopic evidence of cancer, and he adds that it is impossible to assert positively that cancer is absent from a given gland without examining serial sections of the entire gland, several thousand sections in number—which is practically impossible. But the ordinary routine methods gives, he thinks, a fair presumption of the absence of cancer. Here is some additional evidence upon the same point. The left breast, pectorals, axillary fascia, and axillary contents were removed for carcinoma. The axillary lymphatic glands were sent for examination. Mr. Ernest Shaw, whose histological skill is acknowledged, reported that the large glands did not contain cancer, but that some minute ones did. This, too, Mr. Shaw tells me, is an ordinary experience.

Mr. Bilton Pollard,⁴ during his very successful operations for cancer of the intestine, had a similar experience. But here another thing may have happened. As every one knows, the almost inevitable course of cancer is growth, degeneration, ulceration, and sepsis.

In Mr. Pollard's cases the form of carcinoma was one which is particularly prone to early ulceration, and was situated in the midst of sepsis, which may or may not have caused the enlargement of those lymphatic glands in which no cancerous growth could be seen. But it is obvious that a living organism, such as a cancer is, must conform to

physiological rules, and that its products must escape by its veins or by its lymphatics.

Taking into consideration the fact that a cancer is a sort of ductless gland opening freely into the lymphatic system, it is reasonable to fix upon the latter as the outlet. That that which enters the circulation through the lymphatic is very harmful is suggested by the marked accession of health and vigour which often follows the removal of the tumour and of the cancerous glands. To me this cannot be altogether accounted for by the relief of the mental anxiety and foreboding.

The naked eye is an untrustworthy guide, both to the nature of most tumours and to the growth in lymphatic glands. Whilst removing a carcinoma of the breast the lymphatic glands were found enlarged and hard as high as the subclavius tendon, and in the subclavian triangle. From these naked eye appearances it was assumed that they were filled with cancer undergoing degeneration. However, the subsequent microscopical examination showed that they were full of tubercle. This combination of tubercle and cancer has been occasionally met with. What is the meaning of it?

THE ORDER FOLLOWED.

I now come to another question, namely, the order in which the lymphatic glands became cancerous. It is natural for us to assume that cancer follows the course of the lymph stream upon its way from the breast to the nearest group of lymphatic glands. But to turn this generalization to account we must know the direction taken by the lymphatic vessels themselves, and then the direction of the lymph stream within their channels.

Further, we have to assume that the cancerous particles or cancerous lymph, or whatever it may be, passes along the lymphatic channels in the direction of the assumed course of the lymph stream. But my own clinical observations have led me to think that it is quite unsafe to begin with preconceived ideas on these three points, or, in other words, to assume that the cancer will spread in some preconceived direction, and linger in some particular group of lymphatic glands. For instance, our earliest knowledge of the arteries and veins tells us that they anastomose but scantily across the middle line. Hence we easily infer that the lymphatics do the same. But clinical observation soon teaches us the untruth of such an inference. There can be little doubt but that the lymphatics of the breasts intercommunicate across the sternum.

This allows, perhaps, of an explanation of such a case as this: A long-standing carcinoma of the left breast was removed, together with the pectoral muscles, the fasciae, and all the axillary fat and lymphatics. When this was done I could discover nothing wrong with the right mammary gland, but nine months afterwards a minute nodule was felt near its sternal edge, exactly opposite the tumour which had been removed. This minute growth was examined microscopically by the immediate method, and was a carcinoma of the same type as that which had been removed from the other breast. Is it right to think that that cancer had crossed over the sternum along the lymphatics from one mammary gland to the other? In this particular instance this, to me, seems the likeliest explanation; but soon another case of bilateral cancer will be described in which this explanation seems less likely, because the bilateral tumours were not of the same histological type.

I suppose that in the above instance the carcinoma may have grown from one breast to the other in the lymphatics which cross the sternum, or have been forced along them by the cutting and handling during the operation, or carried over before the operation was done in some regurgitant stream set up by the obstruction of the opposite axillary lymphatics. But this mysterious disease is full of puzzles, and will be until its etiology is known.

It would not be easy to explain the following instance of bilateral cancer by supposing that it had grown along the lymphatics or been carried as an embolus. I removed the left breast and pectorals and all the axillary lymphatics, together with a great quantity of others from the posterior triangle of the neck, for the ordinary form of scirrhus carcinoma. Eight months afterwards, the patient was much improved in health, and the left side was quite free from disease, but a small movable nodule had appeared

in the right breast just beyond the outer edge of the areola.

The part of this nodule nearest the nipple was chronic mastitis pure and simple; that nearest the axilla was cancer. Although none could be felt, the axilla contained numerous cancerous lymphatic glands. Now the mammary lymphatics are so abundant and intercommunicate so freely, that it is possible that the cancer had passed along them over to the side of the breast furthest from the original growth; but to me it does not seem likely. Then which came first, the carcinoma or the mastitis? Did the carcinoma cause the mastitis or did it grow in a lobule already inflamed? An answer to these questions may be found in a similar combination of chronic mastitis and carcinoma which was met with in another case. Several of the breast lobules were enlarged and indurated. A nodule of cancer was found in one only. Obviously a constant cause ought to produce a constant effect, and cancer should have been found in all of the inflamed lobules. Probably the chronic inflammation only prepared the ground for the carcinoma in the breast, as it does sometimes in the tongue and elsewhere. Those who attempted to make a correct clinical diagnosis in this case of mastitis and carcinoma were much at variance.

Here is another fact which ought to make us cautious in thinking that the onset of cancer in the other breast is always due to lymphatic transmission, though it may be. I have told you about a case in which a portion of the chest wall was removed for recurrent duct carcinoma of the right breast. Within four months a carcinoma had grown in the left breast, but it was a spheroidal-celled carcinoma undergoing colloid change. Here it is difficult to suppose that a particle of the duct carcinoma had been carried across. But then, again, it may be quite wrong to look for a particulate cause for the various histological kinds of cancer. And here for a moment I may perhaps be allowed to digress, and say that it is rash to infer that when tumours grow in both mammary glands they will be of the same variety.

For example, I removed from the right breast, a cystic fibro-adenoma. Five years later another small tumour grew in the left breast. Although clinically it was exactly like the previous one, yet it proved to be a spheroidal-celled carcinoma. Again, a cancerous tumour had been removed from the right breast by a partial and futile operation. The tumour speedily grew again, but seemed yet within the possibility of complete removal. But whilst the carcinoma was growing in the remains of the right breast a tumour had appeared in the left. The outlook seemed as bad as could be, if, as seemed certain, both breasts were cancerous. But an immediate microscopical examination showed that the tumour in the left breast was a cystic adenoma, so after it had been taken away a complete operation was done for the carcinoma of the right side. More than a year afterwards this operation seemed to have been effectual.

What can be the meaning of these incidents? Why in the same person should one breast bring forth an innocent growth and the other a malignant one? It might save trouble to say that these were mere coincidences, but that would never help us to solve the riddle of this horrible, mysterious, and almost unknown disease.

Thus it is probable that cancer may cross in the lymphatic channels from one breast to the other, but it is evidently rash to assume that it may have done so in any particular instance of bilateral tumours.

I have already mentioned that lymphatics from the inner side of the breast may carry carcinoma into the mediastinal glands. I have only seen this in advanced cases, such as ought not to occur without an effort having been made to extirpate the disease in its earliest and more amenable stages. The admirable work of Mr. Handley⁵ has also gone far to prove the growth of carcinoma from the breast along lymphatic channels which join with those of the abdomen mainly through the epigastric angle. Any one who realizes this must of necessity remove the lymphatic-bearing fascia which lies over the juncture of the great pectoral muscle and aponeurosis of the rectus abdominis. Indeed, in my later operations the rectus aponeurosis itself has been removed, bringing into view the fleshy origins of the muscle from the costal cartilages. This entails but a trifling addition to the extent of the operation, and would be amply repaid

if the risks of intra-abdominal growth be lessened by it. The mammary gland is so widespread that it is not very far from the epigastric angle, and therefore, as every scrap of gland tissue has to be removed, but a slight extension of the incision is necessary.

AXILLARY INVASION.

I now come to the spread of carcinoma of the breast into the axilla. All will agree that this is usually as follows: First, it spreads into the pectoral group of axillary lymphatic glands, and which are so easily felt when enlarged at the lower edge of the pectoralis major. Thence the growth passes onwards into the glands, about the uppermost part of the axillary vein, and thence onwards into the subclavian. As the growth progresses, other groups become involved—that about the subscapular artery and vein, that about the lower end of the axillary and upper end of the brachial vessels. But in practice it is unsafe to assume that the lymphatics become cancerous in regular anatomical sequence.

On many occasions after having taken away the pectoral muscles, I have found considerable enlargement of the uppermost axillary glands, although the lowest pectoral ones seemed to have escaped. This anomaly can be explained upon anatomical grounds, for although the main bulk of the lymphatics of the breast enter the pectoral group of axillary glands, nevertheless others run upwards through the fibres of the pectoralis major, or between the sternal and clavicular heads, to empty into the uppermost axillary or subclavian glands. This important accessory lymphatic channel is described and depicted in Poirier, Cunéo, and Delamare's standard work on the lymphatics,⁶ which has been well and clearly translated by Mr. Cecil H. Leaf, who has himself worked at this subject. I have found in Professor Poirier's work many anatomical explanations of the course of cancer along the lymphatics, which before I had only known from clinical observation.

I have been especially indebted in the case of the lymphatics of the tongue.⁷ Grossmann⁸ succeeded in injecting the accessory mammary lymphatic trunk which runs direct into the uppermost axillary or subclavian glands thrice in thirty subjects. I am inclined to think, on clinical grounds, that this may be too small a proportion. Disease may more readily disclose lymphatic channels than any method of injection, even than the excellent one of Gerota. Although after the removal of the pectorals it is rather the exception than the rule to find the uppermost axillary glands enlarged without any enlargement of the pectoral ones, nevertheless, it is by no means unusual to find them by far the biggest. This may, of course, be capable of other explanations, but one cannot help thinking that they must have got an early and independent supply of cancer short-circuited to them by a separate channel.

I may say that enlarged glands are not commonly met with superficial to the costo-coracoid membrane. Once, however, I met with a large mass lying upon it, and on several other occasions I had encountered two or three.

Enlarged cancerous glands may be met with in rather unexpected places. For instance, in a very advanced case one was found outside the coracoid process beneath the interval between the pectoralis major and deltoid. This gland was situated upon one of the trunks which collect lymph from the arm. According to Poirier⁹ it was first described by Aubry, who says one, two, or three may be found, but not constantly (14 per cent. of cases according to Grossmann). It is rather difficult to guess how any of these become involved in cancer of the breast. Perhaps regurgitation takes place, or what is much more likely, there are loops of communication between these delto-pectoral lymphatics and those of the axilla.

It is hardly necessary to dwell upon the bearing which the above has upon clinical diagnosis and surgical treatment. Obviously, when the mammary gland contains a carcinoma—a fact which can easily be learnt by an immediate microscopical examination of the tumour—it is quite unsafe to infer that, because the lowest axillary glands are not enlarged, therefore the uppermost are not. In the beginning the enlargement of the uppermost axillary glands cannot be detected except by taking away the pectorals. In the later stages it usually causes a slight fullness of the infraclavicular fossa, but this can

only be seen in those who are thin. It is not a sign to be waited for. Fortunately the removal of the pectorals is borne exceedingly well, and is followed by slight impairment of the usefulness of the arm.

Returning again to the axillary lymphatic glands, I propose now to speak of an almost outlying group which on more than one occasion has nearly been overlooked, although enlarged by cancerous growth. This small group is situated about the end of the axillary and beginning of the brachial vessels, and belongs, therefore, to the arm rather than the axilla. As a rule, the outer end of the incision made for removing the breast, pectoral muscles, and axillary contents falls short of these brachial glands, so that, unless the incision be especially carried down the arm for a little way, they will not be brought into view.

Nor can we reckon upon the presence of a continuous chain of enlarged glands along the axillary vessels to point the way to them. Deceptive intervals may intervene between groups of cancerous glands. There is a danger, too, that enlargement of the glands might not have been suspected in a place so remote from the breast tumour. Besides, the casual discovery of cancerous glands by the fallacious sense of touch is not to be implicitly relied upon. Thus, more than once, towards the end of a long operation, when, as a last precaution, the incision has been prolonged down the arm, and the enlarged brachial glands have come into view, I have felt a qualm at the thought lest they might have been overlooked. That would, in all probability, have rendered the whole proceeding futile. Such an incident has occurred but recently. The case was one of Paget's disease. The lymphatic glands were extensively involved, some being adherent to the axillary vein close to the subclavius tendon. The lowest lay over the brachial artery, and these were the ones which were almost overlooked. In another instance it is noted that the brachial glands could not be felt, although greatly enlarged, because the patient was so fat.

It is to be supposed that these brachial glands became cancerous by a process of growth from the axillary and pectoral ones. This would imply that the growth had taken place against the lymph stream, and past a number of lymphatic valves.

But there is another possibility. In Poirier (p. 238) we find it said:

It is not rare to see a vessel, no matter from which of the lymphatic territories it may spring, end in a glandular group other than that which represents the usual terminus of the collectors of the territory in question; thus Nagel has seen one of the trunks coming from the subareolar plexus send a branch to a humeral gland before terminating in the supero-internal thoracic glands.

Presumably this is not a very common occurrence, but neither is marked enlargement of the humeral, or brachial glands, as they are better called.

There is yet another group of axillary glands situated over the subscapular vessels. But these are not at all likely to escape notice, and are removed as an invariable part of a modern operation. I have not seen the subscapular glands separately enlarged. But the growth of cancer in them may add to the difficulties of the operation, and render it less efficacious.

I have already spoken of a case in which a cystic adenoma was removed from the left breast and carcinoma from the right breast and axilla (p. 183). A futile attempt had been made to take away the carcinoma. In the axilla the disease was far spread, and the axillary vein had to be taken away with the adherent glands. But the most difficult and embarrassing step in the operation, and attended with much serious haemorrhage, was the removal of the adherent subscapular glands, and of cancer which had grown far backwards in the spaces above and below the triceps tendon. Through the upper quadrilateral space lymphatics from the deltoid and dorsal scapular muscles accompany the posterior circumflex vessels.

Here again is an instance of carcinoma spreading against the lymph stream. After the lapse of a year this operation seemed to have been successful; but, should the growth reappear near the neck of the scapula, nothing short of Berger's interscapulo-thoracic amputation would suffice. Truly that would be a heavy penalty

to pay for a thoroughly inefficient operation, which the first one was.*

CERVICAL SPREAD.

After a time cancer of the breast spreads into the glands of the neck—usually a late step in the disease. Doubtless the growth nearly always spreads beneath the clavicle, from the uppermost axillary glands and lymphatics into those in the subclavian triangle. But there is a possibility that it may find a shorter way through lymphatics which cross in front of the clavicle along with that morphologically interesting vein, the jugulo-cephalic. According to Poirier, lymphatics have been seen by Grossmann passing over the clavicle from the uppermost axillary glands into the subclavian. Mascagni, too, has seen some of the lymphatics which ascend with the cephalic vein (delto-humeral), cross the clavicle, and enter the cervical glands.¹⁰

When we consider that some of the mammary lymphatics run straight upwards towards the clavicle; and, further, when we consider the abundant intercommunications between contiguous lymphatics, it is not difficult to believe that occasionally some of the mammary lymphatics may short-circuit themselves into the cervical by crossing over the clavicle. Clearly the subclavian lymphatic glands demand careful attention in every case of mammary carcinoma, whether the axillary are or are not enlarged. Indeed, some surgeons carry their distrust so far as to remove the subclavian glands in every case. I myself have not yet reached this stage. I content myself with a thorough dissection carried above and below the axillary and subclavian veins as far as can be reached by raising the clavicle upwards.

In most cases this dissection brings to light a gland which was hidden from sight underneath the great vein just where the subclavius muscle crosses it. Enlarged glands are occasionally found above the vein. Once I found several above and none underneath.

The sense of touch is a fallacious guide to the presence of enlarged glands in the subclavian triangle. Thrice I have explored it to seek for an enlarged gland, which I, and others, too, thought could be felt, and thrice have failed to find any. It is almost certain that the deception was caused by the posterior belly of the omo-hyoid in a state of rigid contraction. Mr. Sheild¹¹ says that the transverse processes of the lowest cervical vertebra have also led to error. One of my patients is well ten years after exploration, so that it is unlikely that an enlarged gland had been overlooked.

This brings us to another point—what ought to be done when carcinoma has spread to the cervical glands? I believe that opinions vary upon this point. Some take a pessimistic view, consider the patient doomed, and refrain from operating; others do not shrink from very extensive dissections of the neck.

But, after all, the dissection of the posterior triangle of the neck is not a very formidable undertaking for either the patient or the surgeon. It is true that it demands, on the part of the latter, skilled experience and thorough anatomical knowledge; but, granted these, the difficulties are by no means serious. After a flap has been turned off the triangle—for small cuts are useless and dangerous—a very searching dissection can be made. Next, the patients seem to suffer little from extensive dissections of either the anterior or of the posterior triangles of the neck. Moreover, the process of repair is rapid and attended with little pain or constitutional disturbance. Indeed I cannot help thinking that the difficulties and dangers of this step have been overrated. Even were this untrue, "the greater the evil, the more vigorous the remedy." Besides, cancer is a disease which varies greatly in its rate of progress. In the thin and abstemious it is often slow, and these are the ones in whom lymphatic enlargement is easiest to detect and easiest to remove.

For example, the right breast, pectoral muscles, the fasciae, the axillary contents, and subclavian lymphatic glands were removed from a spare woman, aged 49. At its commencement the small cancerous nodule had been seen by a surgeon. An immediate examination would have revealed its nature, and it would not have been allowed to spread into the cervical glands. Three years after the extensive removal this patient was quite well,

*This has since been carried out, and was followed by a rapid recovery.

and apparently free from disease. Another was not in some respects quite so fortunate. She had an ulcerated carcinoma of the left breast, and enlargement of the axillary and cervical lymphatic glands. A gland near the top of the posterior triangle of the neck was removed for immediate microscopical examination, and was seen to be full of carcinoma. Being so far from the breast, we thought it might have been tuberculous. The patient was young and vigorous, and anxious that an attempt should be made to relieve her from the pain and misery of an ulcerating carcinoma, and, one might add, from the imminent risk of dying of sepsis. During the dissection of the neck but few glands were met with along the internal jugular vein, nor about its junction with the subclavian. In other words, the state of affairs was not so bad as might have been expected. Eight months afterwards this unfortunate woman came with a small, movable nodule in the right mammary gland.

This I have already mentioned, for it consisted of chronic mastitis and of carcinoma (p. 183). The woman's health being good, and all the left axilla and neck free from any trace of disease, an amputation of the right breast was done. Six months afterwards her condition was quite satisfactory.* But in yet another case the result was less propitious. At the age of 34 the right breast had been amputated for carcinoma. Then the disease grew in the lymphatic glands of the axilla and posterior triangle. In the infraclavicular fossa the mass of glands was immovably fixed. I might have been deterred by this had I not succeeded in removing a similar growth, and which had not returned after the lapse of three years. It took two hours and forty minutes to clear the axilla and posterior triangle. The subclavian veins and artery had to be removed to get away the fixed mass.

The operation was well borne, but the patient died three months afterwards without any local recurrence, but with evidences of growth in the osseous system. Dr. Casey informs me that in the house in which this patient lived her grandmother had died of abdominal cancer, and her grandfather of cancer of the lip.

Sometimes, too, these immovable glands are not so fixed as they seem to be. A woman who nine months before had had the left breast amputated for carcinoma, had a large gland apparently adherent to the head of the left clavicle, behind the attachment of the sterno-cleido-mastoid muscle. When that muscle had been reflected the gland was easily removed. She lived for more than three years, but at last died of cancer. The subclavian lymphatic glands were not enlarged, so that it is not easy to tell how the growth had got into that solitary gland almost in the upper aperture of the thorax: probably by some unrecognized short-circuit. Finally, I doubt whether any rules can be laid down for these operations in cervical cancer. That question has to be weighed and considered and decided for each individual case.

REFERENCES.

- ¹ The Early Microscopical Diagnosis of Tumours. By C. B. Lockwood, BRITISH MEDICAL JOURNAL, July 2nd, 1904, p. 5. ² Loc. cit. ³ The Surgical Anatomy of the Breast and Axillary Lymphatic Glands, etc. Edinburgh, 1892, p. 24. ⁴ BRITISH MEDICAL JOURNAL, January 23rd, 1904, p. 175, et seq. ⁵ The Dissemination of Mammary Carcinoma, by W. Sampson Handley, *Lancet*, April 8th, 1905, p. 909, et seq. ⁶ The Lymphatics, Poirier and Cunéo, translated by Cecil H. Leaf. London: 1903, p. 215, et seq. Fig. 85, p. 235. ⁷ Secondary Infection of the Lymphatic Glands in Malignant Disease of the Tongue, by C. B. Lockwood, *Clin. Jour.*, June, 1904, p. 113, et seq. ⁸ Quoted by Poirier, p. 223, who also says this channel has been seen by Rieffel. ⁹ Loc. cit., p. 234. ¹⁰ Loc. cit., pp. 240, 245. ¹¹ Loc. cit., p. 353.

* She has since had an extensive outburst of her disease upon the chest wall.

HETEROTYPICAL MITOSES IN CANCER.—Drs. Bashford and Murray, in a communication read before the Royal Society, state that their more recent investigations into the nuclear changes which occur in the dividing cells of cancerous growths have led them to modify their views. They now believe that the mitoses which they formerly regarded as confirming the occurrence of a heterotypical reducing division in cancer are in reality somatic mitoses, and they think that the occurrence of heterotypical mitoses in this disease requires further proof. Multipolar mitosis and other irregular forms of cell-division occur in cancer, but these phenomena do not supervene upon heterotypical mitosis; they are entirely independent of its presence, and of themselves suffice to account for the diminutions frequently occurring in the number of chromosomes in cancer throughout the vertebrates.

Remarks

ON

SWELLINGS OF THE BREAST, THEIR DIAGNOSIS AND TREATMENT.

READ AT THE MEETING OF THE ST. PANCRAS DIVISION OF THE METROPOLITAN COUNTIES BRANCH.

By ANDREW CLARK, F.R.C.S., D.Sc.,

SENIOR SURGEON TO THE MIDDLESEX HOSPITAL, PRESIDENT OF THE BRANCH.

WHEN your Chairman honoured me with an invitation to read a paper to this Division I at first demurred, on the ground that I had nothing new to put before you; but when he told me that this was not what was wanted, but a short, practical paper on an everyday subject—something that practitioners had to deal with in their daily work—I thought that I should be able to put something together that might be of sufficient interest to warrant my occupying your time, though I did not then decide what it should be. When I returned to my hospital work in October, I found 4 cases of enlargement of the breast just admitted, and it occurred to me that I might take as my subject Swellings of the Breast and their Treatment, as practitioners are frequently consulted for this condition, and although in many cases the diagnosis is very easy, there are some that present considerable difficulty, and I hope I may be able to offer you some hints or suggestions that you will find of use. Nine women out of ten when they get an enlargement of the breast begin to think about cancer, and we do not wonder at it, for it is so common; the majority go straight to the doctor, a few conceal their trouble, fearing they might be told they have cancer, and preferring to remain in, shall I say, happy ignorance. These cases were all sent as cancer, but they all presented different characteristics, though three out of the four turned out to be cancer. I will, in the first place, enumerate the various conditions that bring women to the doctor saying that they have a swelling or a lump in the breast—that is the way they generally put it—as they occur to me. First neuralgia, then mastitis, abscess, adenoma or fibro-adenoma, cysts of various kinds, and malignant disease, usually carcinoma. I think that includes all. Before commenting on each of these conditions separately, I would remark that there are many cases that after a more or less careful examination we can decide what is the matter, and decide with certainty, and knowing the nature have no hesitation in recommending the treatment that should be adopted; there are others that we cannot be quite certain about the exact diagnosis, but are quite satisfied that removal of the organ is the proper treatment; and there is a third class in which, after a very careful examination, we are not quite certain what the nature of the swelling is, though perhaps we can reduce it to one of two things—a chronic mastitis or a carcinoma—and we are somewhat perplexed, knowing that a few weeks' treatment will probably cure the former, or, at any rate, the patient will be none the worse if an operation is deferred; and that if the latter condition is present, any delay whatever gives the patient a worse chance of complete recovery. I am going to try and point out to you presently the signs by which you may come to a correct conclusion. There are some puzzling cases, as one of the four I have made the basis of these remarks. I was quite certain she had carcinoma or chronic mastitis, and inclining to the latter idea, decided to wait a week before operating. Very shortly further symptoms developed, which made the diagnosis of mastitis quite certain. Of the other three, one was a typical carcinoma, and another so like that disease that I had no doubt about it. The third, however, was a general induration of the whole breast in a woman of 50, and I had no doubt of the propriety of removing it, but until I had removed it and incised it I was not certain what it was. There are some cases where a preliminary incision, when the patient is ready for a more extensive operation if necessary, is the only course to pursue. I remember a case of this kind where the diagnosis was almost certain; a woman, over 40, with a very hard lump in the mamma, with retraction of nipple, enlarged axillary glands, but it