A CLINICAL LECTURE ON HALSTED'S OPERATION FOR REMOVAL OF CANCER OF THE BREAST.

Delivered at St. Bartholomew's Hospital
By HENRY T. BUTLIN, F.R.C.S., D.C.L.,
Surgeon to the Hospital.

EARLIER RESULTS.

In the last lecture I gave an account of the results of my operations for cancer of the breast in public and in private practice from the year 1880 to 1894, inclusive. The total number of cases in which I performed the first operation was 116:

Died of the operation	6
Not yet traced	3
Dead or alive, with local recurrence	51
Dead of cancer without local recurrence	22
Dead of other cause within 3 years of operation	2
Dead of other cause more than 3 years after operation	3
Alive and well	29

As this account will be published in full in the forthcoming volume of the *St. Bartholomew's Hospital Reports*, I merely give the summary here in tabular form.

Some of the cases which are contained in the above table really belong to the year 1895. For, although I began to perform the operation of which I shall presently speak at the beginning of 1895, I did not make it my only operation during that year.

RESEARCHES OF HEIDENHAIN AND STILES.

About the end of the year 1894, I saw a notice of Professor Halsted's paper on the Results of Operations for the Cure of Cancer of the Breast, and in consequence carefully read the paper itself in the *Annals of Surgery* (vol. xx). Although the results of the author were exceedingly good, sufficient time had not elapsed to allow of a final judgment of their value. Nevertheless, they appeared to me to justify a thorough reconsideration of the subject of the operative surgery of cancer of the breast. The operation was suggested by a paper in *Langenbeck's Archiv* (vol. xxxix, 1889) on the Causes of Local Recurrence of Cancer after Amputation of the Breast, by Dr. Heidenhain. I procured this paper and studied it, together with a paper on the Surgical Anatomy of the Breast and Axillary Lymphatic Glands, reprinted from the *Edinburgh Medical Journal* (1892), which the author, Mr. Harold Stiles, had been so kind as to send me.

Both authors came to the conclusion, from a general and microscopical examination of a number of breasts which had been removed, that cancer of the breast rapidly extends back towards, and then into, the pectoral fascia, even when there appears to the naked eye to be a considerable interval between

the posterior border of the tumour and the fascia, and that the pectoral fascia is often very difficult to separate satisfactorily from the surface of the muscle. Both authors agreed in believing that the entire mammary gland is not removed by the operations which are usually performed, especially in thin women, and that cancer cells are soon and widely conveyed through the lymphatics of the breast, and particularly towards the pectoral fascia.

They differed in opinion on two questions, the first of them of comparatively small importance, because they both advised that the entire mammary gland should be removed. Heidenhain averred that every mammary gland which contains a nodule of cancer is, in very wide extent, probably *in toto*, diseased. Stiles had not found this to be the case, but as he had discovered cancerous cells or emboli in the lymphatic vessels of distant parts of the breast, the practical result was much the same. Heidenhain accepted the description of the lymphatics of the breast by Langhans, who makes those of the gland quite separate from those of the overlying skin, except where the two systems communicate through the great lymphatic plexus beneath

the areola, through which all the lymph passes from the mammary gland below and from the integument above. From this plexus it is conveyed to the inferior axillary glands through two large afferent vessels. Stiles apparently designed the lymphatic system from the discovery of cancer emboli in lymphatics: (1) in the connective tissue processes radiating from tumour into the surrounding breast tissue or circum-mammary fat; (2) in the breast tissue remote from, as well as close to, the tumour; (3) in the connective

Fig 1.—To show the skin incision in the case of cancer above the nipple and the triangular flap dissected back to its base line.

tissue septa, separating the lobules of the circum-mammary fat; (4) in the so-called "ligaments of Cooper," where they often lead to small disseminated cancerous nodules in the corium; (5) in the retromammary tissue and pectoral fascia. Stiles also made a very important observation to the effect that "occasionally the glands above the pectoralis minor, in the apex of the axilla, and under the clavicle, are diseased, while the pectoral glands are normal. This points to the probability that some of the lymphatics from the mamma pass to join the glands at the upper part of the axilla directly, without entering the pectoral group."

Looking back on my own clinical experience in order to see how far it seemed to be consistent with the investigations of Heidenhain and Stiles, I could quickly remember several cases in which recurrence had taken place in the substance of the pectoral muscle, after the removal of a cancer which appeared to be quite separate from the pectoral fascia, and even after the fascia had been roughly dissected off. Seeing how wide an area of apparently healthy tissues I had removed in every case that I had operated on, and how large

an area of integument I had taken away, I thought the frequency of recurrence *in situ* was much greater than it should have been. Again, I remembered cases in which the glands low down in the axilla had been little or not at all affected, while those above the pectoralis minor were larger and more obviously cancerous. And it also seemed to me that plaques and nodules in the skin are usually grouped, in the first place, at least, around or in the neighbourhood of the cancer and not about the nipple. I could not say certainly whether recurrence takes place in the tissues between the breast and the axilla, in which the lymphatic vessels run, but I was disposed to think it does not.

My own experience, therefore, led me to think the observations of both investigators were very valuable, particularly on the frequency and rapidity with which the cancer travels backwards towards the pectoral fascia, and on the affection of distant parts of the breast and fat of the breast. But I was much more inclined to accept the description of the lymphatics by Stiles than that by Langhans, which had been adopted by Heidenhain. It appeared only reasonable to hope that an operation designed to remove thoroughly the structures in which cancer of the breast may be disseminated would be a means of saving the lives of a few more women in every hundred of those submitted to operation.

HALSTED'S OPERATION.

The operation designed and practised by Halsted appeared to me to fulfil the requirements better than any other, and, since the beginning of 1895, I have made it my routine proceeding, although various reasons have led me to operate by the older methods from time to time, especially during the first year.

Everything which is removed comes away in one continuous mass, and this mass contains the whole of the mammary gland, the whole of the pectoral muscle, with, perhaps, the exception of the clavicular portion; the fascia beneath the pectoral muscle and that in front of and behind the lesser pectoral, the loose connective tissue on the side and back walls of the axilla, the fat and all which it contains right up to the clavicle. In order to accomplish this more effectually, the lesser pectoral muscle is divided and the coracoid portion is turned up.

As Professor Halsted lays great stress on the details of his operation, I will give it as far as possible in his own words, simply omitting the remarks and opinions with which the description is interspersed:

1. The skin incision is carried at once and everywhere through the fat.

2. The triangular flap of the skin is reflected back to its base line (that is, the posterior fold of the axilla). There is nothing but skin in this flap. The fat which lined it is dissected back to the lower edge of the pecto-

ralis major muscle, where it is continuous with the fat of the axilla.

3. The costal insertions of the pectoralis major muscle are severed, and the splitting of the muscle, usually between its clavicular and costal portions, is begun, and continued to a point about opposite the scalenus tubercle on the clavicle.

4. At this point the clavicular portion of the pectoralis muscle and the skin overlying it are cut through hard up to the clavicle. This cut exposes the apex of the axilla.

5. The loose tissue under the clavicular portion (the portion usually left behind) of the pectoralis major is carefully dissected from this muscle as the latter is drawn upward by a broad, sharp retractor.

6. The splitting of the muscle is continued out to the humerus, and the part of the muscle to be removed is now cut through close to its humeral attachment.

7. The whole mass, skin, breast, areolar tissue, and fat, circumscribed by the original skin incision, is raised up with some force, to put the submuscular fascia on the stretch as it is stripped from the thorax close to the ribs and pectoralis minor muscle. It is well to include the delicate sheath of the

minor muscle when this is practicable.

8. The lower outer border of the minor muscle having been passed and clearly exposed, this muscle is divided at right angles to its fibres, and at a point a little below its middle.

9. The tissue over the minor muscle near its coracoid insertion is divided as far out as possible, and then reflected inward in order to liberate or prepare for the reflection upward of this part of the minor muscle.

10. The upper outer portion of the minor muscle is drawn upward with a broad

Fig. 2.—To show the exposure of the axilla, after the removal of the greater pectoral muscle and the division of the lesser pectoral, the coracoid portion of which is held up by a sharp retractor.

sharp retractor as is shown in the illustration (Fig. 2).

11. The small blood vessels under the minor muscle near its insertion must be separated from the muscle with the greatest care. They should be dissected out very clean, and immediately ligated close to the axillary vein.

12. Having exposed the subclavian vein at the highest possible subclavicular point, the contents of the axilla are dissected away with scrupulous care, also with the sharpest possible knife. The glands and fat should not be pulled out with the fingers. The axillary vein should be stripped absolutely clean.

13. Having cleaned the vessels, we may proceed more rapidly to strip the axillary contents from the inner wall of the axilla—the lateral wall of the thorax. We must grasp the mass to be removed firmly with the left hand, and pull it outward and slightly upward with sufficient force to put on the stretch the delicate fascia which still binds it to the chest. This fascia is cut away close to the ribs and serratus magnus muscle.

14. When we have reached the junction of the posterior

and lateral walls of the axilla, or a little sooner, an assistant takes hold of the triangular flap of skin and draws it outward, to assist in spreading out the tissues which lie on the subscapularis, teres major, and latissimus dorsi muscles. The operator having taken a different hold of the tumour, cleans from within outward the posterior wall of the axilla. Proceeding in this way, we make easy and bloodless a part of the operation which used to be troublesome and bloody. The subscapular vessels become nicely exposed and caught before they are divided. The subscapular nerves may or may not be removed, at the discretion of the operator.

15. Having passed these nerves, the operator has only to turn the mass back in its normal position, and to sever its connection with the body of the patient by a stroke of the knife.

(The two figures (Figs. 1 and 2) are copied from plates illustrating Halsted's paper).

I think this operation exposes the axilla far better than any operation we have been in the habit of practising in this country; and I do think it is desirable to remove a large part of the greater pectoral muscle with the fascia over and beneath it. It is, of course, a serious operation, and should be performed deliberately and with great care to take up every vessel as soon as or even before it bleeds. This is especially desirable in the separation of the pectoral muscle from its sternal and costal attachments. If care is taken to lessen the hæmorrhage, the operation is not more dangerous than any other large operation for the same disease. Between the beginning of 1895 and the end of 1897 I performed it thirty-three times, with one death.

The removal of the pectoral muscle and the division of the lesser pectoral do not impair the movement of the upper extremity. This depends on the area of skin which has been removed. The accompanying copy of a photograph (Fig. 3) shows how freely the arm can be moved. It is not taken from a selected case, but from a patient who happens to be in the hospital and on whom I operated some three years ago.

As in the last lecture, so in this, I shall only give the results of those operations which were performed more than three years ago, in order that every case may fall under the same time limit. Of the 33 cases, therefore, in which I have performed Halsted's operation, only 13 are available, and, of these 13, 9 were alive and well when last seen or heard of (from their medical men) at periods of from three to four years after the operation. As 11 of the patients were treated in the hospital, and the operation was a new one, my staff have been

greatly interested in the results, and have secured the attendance of nearly all, if not of all, the patients from time to time, so that I have been able to exhibit them to my class within the last few weeks. The disease was examined microscopically in every instance in the pathological department. In one case it proved to be a duct carcinoma (not a bad type of malignant disease), but in the remaining cases it belonged to the ordinary variety of spheroidal-celled carcinoma. In more than one of the successful cases the glands in the axilla were cancerous.

Died of the operation...	...	...	...	...	1
Dead or living with local recurrence	...	...	...	...	2
Dead of cancer without local recurrence	...	...	...	...	1
Alive and well...	...	...	...	...	9

The tabulation of the 13 cases is given above.

Of course I cannot but regard this as a peculiarly fortunate series of cases, and I have no hope that an equal measure of success will be achieved in the next or in future series of 13 cases, for the proportion of successful cases is nearly 70 per cent. which we are not likely to attain for the present.

I have not removed the supraclavicular glands in any of my cases, for I am disposed to think with Cheyne that cases in which the supraclavicular glands are affected are hopeless, but I reserve my opinion on that matter for the present.

WHAT MAY BE HOPED FROM OPERATION IN THE FUTURE.

I am not so sanguine as to believe that surgeons are going to cure every case of cancer of the breast by operation at some not far distant time; but I do believe that far better results will be secured in the future than we have been accustomed to in the past. In 1887, on a large series of operations performed by various surgeons, I was only able to declare success to the value of 10 per cent. Mr. Mitchell Banks had brought his own statistics up to 15 or 20 per cent. And the mortality due to the operation was very considerable, not less than 12 per cent. to 16 per

cent. Compare with these the results furnished by Mr. Watson Cheyne in the Lettsomian Lectures, 1896, by Professor Halsted, and by myself. Mr. Cheyne has not adopted Halsted's method, but he has performed an operation which is very sweeping and fairly in accordance with the researches of Stiles. Forty-two of the patients treated by the three operators were treated more than three years ago, and 23 of the 42 are still alive and well, or have died of some other cause than cancer after passing the three years' limit.

And these results have been secured under the most disheartening circumstances. There is scarcely a single case in which the disease was not known to have existed for

Fig. 3.—Patient after Halsted's operation, to show free movement of arm.

several months; and in many of them it had been noticed for one, two, or more years. There were several of them in which the primary tumour was ulcerated, and several in which the axillary glands were filled with cancer.

It is much the same in public and in private practice. The operation is frequently performed solely for the sake of palliation. Nor can one be surprised that this is so. Cancer of the breast is very insidious in its onset, and is often discovered by accident. Neither the doctor nor the patient can bring themselves to believe that the little indolent, painless lump is really cancer; so valuable time is lost while the progress of the disease is being "watched."

Neither the patient nor the doctor has much faith in the value of an operation except as a palliative measure. The majority of medical men believe that "once cancer" means "always cancer," and, if the disease does not reappear in the breast or axilla, it will break out in some other part of the body. The discussion on Mr. Sheild's paper at the Royal Medical and Chirurgical Society during the course of last session revealed the fact that this opinion is shared by some operating surgeons of high standing and long experience. I was at first at a loss to understand why this should be so. I now attribute it chiefly to two causes—the imperfect adaptation of the operations to the disease, and the fact that the patients who have been treated have not been followed up after the operation. One surgeon said that the untraced cases would be found at Somerset House, and in the search for my patients I sent there to seek their names in the death registers. Many of them were found, but those which were not found there were hunted out with extraordinary skill and patience by my former house-surgeon, Mr. J. Preston Maxwell, to whom I am greatly indebted for assistance. It will be seen in the table of earlier results that only 3 of the 116 patients have not been traced, and all the Halsted cases have been kept under observation. I do not know whether we shall still discover the remaining 3 patients, but we have every reason to believe that one of them at least is living and engaged as a domestic servant.

I trust that the results I have been able to publish in this lecture, added to those of Mr. Watson Cheyne and of Professor Halsted, will do something to encourage both medical men and their patients to take a more hopeful view of the possibilities of operation against cancer of the breast. We shall then procure the cases at a much earlier period for operation, and shall, I am sure, obtain far better results.

REMARKS

ON THE

TREATMENT OF FRACTURE OF THE PATELLA BY THE OPEN METHOD AND SUTURE.

By SIR WILLIAM STOKES, F.R.C.S.I.,

Surgeon-in-Ordinary to Her Majesty the Queen in Ireland.

THERE are few operative measures that have been suggested and practised of late years that afford better evidence of the value of aseptic practice than the treatment of fracture of the patella by the "open method." To Lord Lister we are indebted for the introduction of this important addition to our surgical resources. Formerly, any open wound involving the knee-joint was looked upon—and with good reason—as one of the most serious accidents that could happen. In a large proportion of such cases acute suppurative inflammation with septic complications as a rule promptly set in, and ended either fatally, or in the necessity for amputation. In illustration of the good results that may be anticipated after the operation of suturing the patella by the open method, the following case affords a signally good example. It is the fifth case of the kind I have treated by this method, and although suppuration occurred in one, the result was eventually, as in all the others, satisfactory.

For the notes of my last case I am indebted to my clinical clerk, Mr. Henry H. Swanzy, jun.

J. L., aged 28, by occupation a messenger in a victualler's establishment, was admitted into the Meath Hospital under my care on April 18th, 1898, suffering from a fracture of his right patella. While carrying a side

of beef on his back down the paved yard of his employer he slipped and fell, and in doing so heard a "crack," doubtless produced by the bone lesion. On his admission into hospital almost immediately after the accident, the right knee was found to be enormously swollen, and on close examination the two fragments of the fractured bone could easily be determined separated by an interval of fully 1 inch. On being placed in bed, the limb was kept at first raised, a posterior well-padded splint adjusted, and a cold evaporating lotion applied. On the second day after the patient's admission into hospital (April 20th) I operated. A free vertical incision was made over the centre of the joint, and I found, on opening into it, that it was as usual occupied by several large blood clots. The bone fragments were widely separated, so much so that I feared a sufficient approximation of the fragments to bring them into accurate and immediate apposition would not be found possible. In this, however, I found subsequently that I was mistaken. Over the divided or broken surface of the upper fragment a large curtain-like flap of periosteum was found completely covering it, thus forming a fibrous barrier between both fragments. Its forcible detachment must have taken place close to the lower edge of the inferior fragment. This fibrous curtain was then excised, the blood clots removed, and the joint thoroughly irrigated with sterilised water. The fragments—the broken surfaces of which did not require to be refreshed, the fracture being so recent a one—were then sutured together with strong sterilised silk, this being effected rapidly and efficiently by my crochet suture needle. The bone was found very hard and dense—in truth, almost of the consistence of ivory. Two sutures were applied and the edges of the skin wound approximated by a continuous suture of fine sterilised silk. The limb was then fixed again on a posterior splint and kept elevated. Nothing noteworthy occurred during the convalescence of the patient. The wound healed without a trace of suppuration; the patient remained afebrile throughout, and on May 16th he left hospital for the convalescent home. On September 14th he returned to hospital to exhibit the knee. Its movements were found to be perfect, and the patient maintains that "it is a better knee than the other."

It will be observed that in the preceding case the variety of suture employed differed from that originally recommended by Lord Lister, which was silver wire. In both of my first two cases I employed wire sutures, but did not succeed in either of them in getting them encapsuled or quiescent. Though the results in both cases were eventually most favourable, the wires gave rise to irritation, and eventually had to be removed. I then determined to substitute sterilised strong silk, and in my later cases have employed it with most satisfactory results.

A good deal has been written of late, notably by Mr. Arthur Barker, in reference to the advantages derived from opening the joint, not by a direct vertical central incision, but by an oval flap, the convexity of which is directed upwards, thus avoiding a central cicatrix over the patella. The flap method has also been advocated by Dr. Ball, the convexity in his cases being, I believe, in the opposite direction. I think, however, the alleged advantages of such methods are much over-estimated, as in none of my cases have I found that the existence of the central cicatrix has been attended with any inconvenience to the patient. In kneeling it must be remembered that the pressure is not so much on the patella as on the tubercle of the tibia below the cicatrix.

Notwithstanding the good results obtained by Mr. Barker, the method of suture advocated by him of passing a wire behind both fragments does not commend itself to me, as I cannot but think that the permanent presence of a foreign body in the knee-joint must be a continual source of peril. None of the methods of subcutaneous suture either appear to me desirable for two reasons, first, because no provision can be made for clearing the joint of blood clots; and, secondly, if, as I believe is usually the case, a periosteal curtain intervenes between the fragments—a condition of things which was conspicuous in the case recorded above—no means exists by any method of subcutaneous suture for bringing the broken fragments into accurate and immediate apposition. I believe the open method of suture should be adopted in all cases of fractured patella, recent as well as old, unless some distinct contra-indication for any operative procedure exists. The operation is, of course, a serious one, and should not, I think, be undertaken by any surgeon unless he is constantly engaged in the performance of surgical operations carried out with the strictest and most careful antiseptic and aseptic precautions.

The objections that I think may be urged against the subcutaneous methods and retropatellar suture—the latter suggested originally, I believe, by the late Professor Volkmann—are:

1. The impossibility of thoroughly freeing the joint of all blood clots, an objection equally applicable to the circumferential as well as the retropatellar methods of suture.
2. The inability to deal with the fibrous curtain which so frequently has been observed to exist between the broken