THE HARVEIAN LECTURES

ON THE

SURGICAL TREATMENT OF TUBERCULOUS DISEASES.

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LECTURE I.

TUBERCULOSIS OF LYMPHATIC GLANDS.

In choosing the treatment of tuberculous diseases as the subject of these lectures, I propose to deal with a group of affections which interest both the surgeon and the physician, and which forms one of the most common of the more serious diseases which come under the notice of the practitioner. As a surgeon, I of course limit myself to those lesions which are accessible to surgery, and as the various surgical tuberculous lesions are too numerous for consideration in the three lectures which are at my disposal, and as I have already fully discussed on several occasions the subject of tuberculous diseases of bones and joints, I propose to confine my attention to tuberculous gland disease, tuberculous peritonitis, and genito-urinary tuberculosis.

[The lecturer, in the first place, discussed several points as regards the etiology of these tuberculous diseases which have considerable bearing on treatment; more especially the questions regarding the local character of the disease and its mode of production, and the questions regarding the possible primary or secondary nature of the tuberculous deposits, the latter question being of great importance with regard to surgical treatment. It was pointed out that it was of importance to know in operating on a tuberculous lesion whether the surgeon was operating on the only one present in the body (in which case there was a chance of ridding the patient of his disease altogether), or whether he was only operating on a local manifestation of disease existing elsewhere. In the former case he might aim at a completeness in the operative procedure perhaps somewhat in excess of the actual necessities of the case, in the hope of eradicating the disease entirely; while in the latter case only procedures which were necessary to get rid of the local affection itself would be adopted. It was pointed out that in many cases the disease undoubtedly is primary, but in the case of the deeper-seated tuberculosis this is not always clear; nevertheless, in a considerable number of cases which have been examined *post mortem* no other deposit could be found in the body than the one local condition, and the lecturer said that it was his impression that where we have a lesion which remains for a long time single, it is very probable that we have to do with a primary deposit, or one which has arisen by fresh infection from without; while lesions which arose from an already existing deposit were more often multiple, the various lesions appearing at the same time or in rapid succession. The result of these considerations was summed up as follows:]

Tuberculous disease is, in the first place, a local affection, and it may be local even though it is situated at a considerable distance from the possible point of entrance of the bacilli into the body. From this primary deposit tubercle bacilli may be disseminated; either in large quantities along with cheesy particles giving rise to an acute general tuberculosis, or to acute tuberculosis of an individual organ; or in small numbers which may or may not settle in other parts. These apparently secondary deposits may, however, not arise from the former one, but may be new lesions originating from them in the same way as the original one did. It is also probable that tubercle bacilli may live in the blood for some time, and unless they meet with circumstances under which they can grow may remain quiescent or die out.

[Further, in the production of tuberculous disease the number of bacilli which gain access to the part in the first instance plays an important rôle in the subsequent severity of the disease in cases where the tissues are not particularly susceptible, and it is possible also that there are variations in the virulence of the organisms. Apart from these conditions affecting the bacilli, the chief determining cause of the severity of the disease lies in the tissues themselves, and in their power to resist the attacks of the tubercle bacilli; and on this also depends

the effect of treatment, more especially of those forms which may be grouped under expectant treatment, where nothing is done specifically against the bacilli themselves.

As regards the operative measures to be adopted in these cases, when it has been found after full trial of medicinal treatment that operation is necessary, it was pointed out that naturally the ideal procedure was complete removal of the tuberculous tissue, but that in cases where this was not possible or desirable much could still be done by partial operations. These, however, should not be employed in the very acute forms of tuberculous disease, but in the chronic forms the removal especially of the caseating foci, even although tubercles are left behind in the tissues around, may have great influence in arresting the trouble.]

TUBERCULOSIS OF THE LYMPHATIC GLANDS.

[Attention was specially directed to tuberculosis affecting the cervical lymphatic glands, which is the most frequent seat of tuberculous gland disease accessible to surgical interference. This occurs most often in the anterior triangle, especially towards the upper part; then in the posterior triangle, and then in the sub-maxillary triangles. The mode in which these glands become infected is a matter of great importance. It has been pointed out that the onset of tuberculosis in the cervical glands is often associated with some acute inflammatory condition, such as tonsillitis, pharyngitis, carious teeth, adenoids, otorrhoea, eczema about the scalp, etc. In the ordinarily accepted view the tubercle bacilli enter at these points, are carried to the glands, and set up disease there. It is, however, very seldom that one meets with typical tuberculous ulceration in these regions, and hence it must be assumed that the bacilli pass through the mucous membrane or through open wounds without causing a local tuberculosis at the point of entrance. This possibility is founded on Klebs's experiments, which, however, have been somewhat weakened by experiments conducted by Baumgarten and Tangel. Tubercle bacilli have, however, been found in the sockets in connection with carious teeth, and tuberculosis of the tonsils is not uncommon in cases of phthisis. In almost all the cases where tonsils have been examined for tuberculosis the patients have also been suffering from phthisis, and the investigations made were rather on the state of the tonsils in phthisical patients than on the state of the tonsils in the cases of tuberculous glands in the neck. Krückmann found that in 20 cases of phthisis there were tubercles in the tonsils in 12. Schlenker in 22 *post-mortem* examinations of cases of phthisis found tuberculosis of the tonsil 14 times. Schlesinger says that there is almost always tonsillar tuberculosis in phthisis. If this be the case, when we bear in mind how rare enlarged glands of the neck are in cases of phthisis, it is rather an argument against the entrance of bacilli from the tonsils as a common cause of tuberculous glands in the neck. Dr. Craven Moore in fact refers in his paper in the *Journal of Pathology* to an unpublished research by Delépine and Yonge, in which the tonsils were examined in 17 cases of tuberculous glands without phthisis, and in no instance could tuberculosis be demonstrated. When tuberculous glands are secondary to ear disease, in all probability the bacilli have come direct from the ear. In cases of eczema capitis also it has been stated that tubercle bacilli are present in the eczematous patch, but many investigators have failed to confirm this.]

In all these cases of enlarged glands in the neck it is very common to get a history of an acute inflammatory enlargement of the glands in connection with some acute process at the origin of the lymphatic vessels, such as boils, carious teeth, quinsy, eczema capitis, etc., at the commencement of the trouble, and that as this passed off the glands began to subside, but instead of disappearing, as would be the case in a healthy subject, they subsequently enlarged and assumed the characters of tuberculous glands. No doubt it might be that tubercle bacilli entered the glands from the mouth or other source of irritation at the same time as the acute inflammation occurred, and that they afterwards grew and led to the tuberculosis of the glands; but in view of the researches mentioned previously and the remarkable absence of tuberculous sores at the point of entrance, even although wounds or abrasions were present; and in view, further, of the very frequent occurrence of tuberculous glands in different

members of the same family, I cannot think that this represents the whole truth. When we remember that in the case of joints and other deep-seated lesions the infection must practically always come from the blood, and that in children the bronchial glands are so frequently tuberculous, I cannot but think that in the case of the cervical glands infection often occurs from the blood also, and, in the absence of a primary tuberculous focus, I am inclined to think that in many cases we have to do with a non-specific inflammation of the glands in the first instance, and a subsequent infection of these inflamed glands with tubercle bacilli from the blood stream.

[After referring to the supposed less virulent nature of tuberculosis of the glands, which the lecturer doubted, and the possible explanations of this view, he went on as follows:]

As regards the clinical characters of tuberculous glands, we find great variations in different cases as regards the number and size of the glands affected, the rapidity in the progress of the disease, and the tendency to softening and abscess formation. From the point of view of treatment, we may consider the cases under the following five heads:

1. In some cases the glands remain hard and small, not large enough to produce deformity, and with no marked tendency to softening. Here one usually finds a number of glands of varying size, but for the most part small, hard, movable, and without any matting together. Fresh glands tend to become involved, though slowly, and if there is no intercurrent trouble, either local, such as sore throat, etc., or general, such as measles, chicken pox, influenza, etc., they tend to disappear gradually as the patient grows older. Where, however, intercurrent troubles, such as those mentioned, appear, suppuration may occur in one or more glands, or the whole trouble may take on a more acute course.

2. In a second set of cases the glands enlarge steadily, or it may be by fits and starts, attain a large size, and become very numerous, so that by-and-by the whole side of the neck becomes a mass of enlarged glands and great deformity is produced. This condition is usually bilateral, although it may be more marked on one side than the other, and it may go on for a long time without the occurrence of suppuration, the glands also remaining more or less mobile and discrete. The glandular disease tends to spread to the axilla. The patient frequently has a pasty complexion, feels weak, and the general health is not good. On removing these glands one frequently finds that they have been converted into large masses of cheesy material; in other cases, while some show only a few caseous or calcareous nodules, others appear fleshy on section to the naked eye without any sign of degeneration; under the microscope, however, one finds that the latter are infiltrated with tubercles and tuberculous tissue.

3. A third variety is where the glandular trouble is more acute and more likely to end in suppuration. Here, in the first instance, the disease may be apparently limited to a few glands, which, however, enlarge pretty rapidly. Further, peradenitis occurs, the glands tending to become more or less matted together and adherent to the tissues around, while fresh glands enlarge. Where we have this state of matters we find that the glands are breaking down, and suppuration will in all probability occur. If left to itself abscess after abscess may form till numerous ulcers are present, often extending round the neck in the submaxillary regions and downwards along the triangles.

4. We may have to deal with tuberculous glands with unopened abscesses. Suppuration in connection with tuberculous glands may be met with under various conditions. Most commonly the state of matters is that described in No. 3, but in some cases the disease may be much more limited, and only one gland or one or two small glands may break down. Again, we may divide these cases into those where the abscess is still beneath the deep fascia, and those where it has burst through and formed a subcutaneous swelling, often with thin skin over it. Again, in some cases, the gland may be only partially broken down, and a large quantity of cheesy material and diseased glandular tissue is found at the bottom of the cavity when the abscess is opened. On the other hand, the gland may have completely broken down, and we practically have only a bag of pus. The latter condition is seldom found except where the abscess has gone on increasing underneath the fascia, usually beneath the sterno-mastoid muscle. Where

the abscess comes quickly through the fascia it generally bursts before the gland has been completely destroyed.

5. Lastly, we have to do with cases where abscesses have burst or been opened and where sinuses remain. In some instances these sinuses may be numerous while in others there may be only one or two. In any case the sinus leads down through a hole in the fascia to the remains of the gland, and generally there is a quantity of cheesy and calcareous material and broken-down gland tissue at the bottom. In addition the skin at the orifice of the sinus becomes the seat of a tuberculous ulcer, so that we may have a large sore in that situation with undermined edges.

In discussing the treatment of tuberculous glands I do not propose to enter into detail on the medicinal treatment, but to indicate the cases which require surgical interference and to describe the nature of such interference. Medically there is very little to be done actively against this disease. The patient should, of course, be placed under the best hygienic conditions—country or seaside air, cod-liver oil, sunshine, and a nourishing diet. Some surgeons place great reliance on arsenic in the treatment of this and other tuberculous diseases. Buchner was one of the first to advocate the use of arsenic in tuberculosis on the supposition that it led to the development of fibrous tissue around the tuberculous lesions, and so encapsuled them or even brought about their disappearance. However that may be, increasing doses of arsenic not uncommonly lead to diminution in the glands, and should be tried except in cases where immediate operation is imperative. Where the glands are showing any tendency to enlarge or become matted together it is well to fix the head, and this can be readily done by means of a back splint, which takes a purchase around the thorax, with wings coming forward at the upper part and grasping opposite sides of the head above the ears—practically the splint introduced a good many years ago by Mr. Treves. Attention should also be paid to all possible sources of irritation; carious teeth should be removed, enlarged or diseased tonsils should be excised, adenoids should be operated on, eczema of the skin should be seen to, etc.

As regards local applications over the glands—such as mercurial or iodide of potassium ointments, iodine, etc.—they are, in my experience, of little use. Indeed, where the gland is large and superficial and on the point of breaking down, the irritation of the skin over it with iodine may actually precipitate the suppuration instead of preventing it. Attempts have also been made—and I have made a good many myself, by injecting antiseptic materials into the substance of the glands—to arrest the disease, the materials employed being arsenic, undiluted carbolic acid, iodoform, etc., but none of these have led to any good result, and I cannot recommend them.

With regard to these expectant methods of treatment, it is of great importance to remember that they must not be carried too far, and it is of especial importance not to send the patient so far away that he cannot be kept under observation. One is very apt to allow the patients to go off to the country for an indefinite time, and then find when they come back that suppuration has taken place and that operation is imperative; the operation then required will probably be more extensive, certainly it will be more difficult and less certain as regards its results, than if it had been done earlier. Where there is any doubt about the case, and especially where one sees the patient for the first time, it is better to watch the case for a time rather than to send the patient away at once.

The operative procedures adopted in these cases are twofold, namely, either excision or scraping. If excision is adopted its aim is not only to get rid of the actually enlarged glands, but to remove the disease, if possible, completely so as to avoid recurrence. To do this it is clear that not only should the large glands be taken away, but also the smaller ones in the vicinity which are likewise infected, and the operation to be effectual must be pretty extensive even in comparatively limited cases. The sort of operation which I recommend and am in the habit of practising will be presently described. Scraping, on the other hand, only affects an individual gland or glands which are breaking down, and leaves any others which may be infected behind. These may subside and not give any more trouble, or, on the other hand, especially in the third form above mentioned, they may rapidly enlarge,

and fresh scraping may be necessary. This method has its uses in certain cases, as will be presently pointed out, but it must rank second in importance and in choice to complete excision.

As a matter of curiosity I have looked out the last 100 cases of tuberculous glands in the neck on which I have operated, with the view of seeing the sort of treatment adopted and the results. Of these 100 cases 30 had unopened abscesses and 18 had sinuses. In some cases scraping and excision were performed in different situations at the same time. The following are the results:

In 84 cases excision was employed in the manner to be presently described. (In 4 of these sinuses in the neighbourhood were scraped.) In some both sides were operated either on the same day or after a week's interval; 19 of these had abscesses, and 10 had sinuses.

In 12 of these cases other glands in the neighbourhood subsequently enlarged and required further operation. For example, where the anterior triangle had been cleared out glands subsequently enlarged in the sub-maxillary region or on the other side or in the posterior triangle. In none did recurrence take place in the area operated on.

In 20 cases scraping was done either because sinuses were present or because there was a single large abscess. In 11 of these unopened abscesses were present, and in 8 sinuses. In 9 recurrence took place *in situ* and further operation was necessary.

Let us next consider the treatment to be adopted in each of the five classes of cases above referred to.

1. These cases may well be watched for a time, treated with arsenic, country air, good hygienic conditions and so forth, and unless the disease becomes active, most usually as the result of some intercurrent affection, there is as a rule no need for any surgical interference. There is no marked deformity in these cases; there is not as a rule much tendency to suppurate, and probably no great danger of dissemination of the disease. As long therefore, as the glands remain quiescent these cases may be left alone in so far as active intervention is concerned.

2. The second class of cases, where there is marked enlargement of glands amounting to deformity, and where the glands are numerous and spreading, generally requires operation. A trial of the arsenic treatment may be given, but if it fails operation had better be resorted to. It is not advisable to wait too long in these cases, for the tendency is to progressive infection of the glands, and country air and other expectant means have but little influence on them. As has already been said, in many cases these swellings are simply composed of a mass of caseous material, and while they may not break down the disease has a great tendency to spread down the neck into the thorax and axilla, and to prove a distinct source of danger to the body generally. The only operative procedure possible here is excision; scraping is quite out of the question. The excision, to be of use, must be especially free, and if it is found that any glands beyond the area of operation have escaped they should be subsequently removed.

3. In this group the matting together of the glands as the result of periaadenitis shows that active inflammatory processes are going on in them; and while they sometimes subside after careful treatment, their progress must be especially closely watched, and, if no improvement follows, operative interference should be carried out before a definite abscess has formed. In these cases some surgeons adopt scraping, others free excision, and I have no hesitation in expressing my very decided preference for the latter course, and that for the following reasons. In the first place, we seldom have only one gland enlarged, while the scraping only affects the individual gland penetrated by the instrument. It is, of course, possible to push the instrument on into other glands, but the result is not very satisfactory, and the smaller glands, which are also infected, are left untouched. Besides, even as regards the glands which are scraped out, it is often difficult, unless they are very much broken down, to clear them out completely, and thus tuberculous material is apt to be left behind, which rapidly grows and infects the wound, and thus recurrence very often takes place. It often happens also that the smaller glands enlarge, and a mass quickly forms as large or larger than the original one, and it is probable that the irritation of the scraping increases the inflammation and leads to this enlargement. Further, in a certain number of cases acute general tuberculosis has followed such scraping.

The results of excision in these cases are, as a rule, highly satisfactory, provided that the operation is so extensive as to include the fat and smaller glands in the neighbourhood, and that none of the operation is done by scraping. Some sur-

geons, when the glands are adherent to the internal jugular vein, as they often are, remove as much as they can with the knife and scrape the part adherent to the vein; but, as I shall state presently, there is no objection to removing the vein along with the adherent gland, no harm whatever resulting from this procedure. I have seldom seen recurrence after these operations, and this is the experience of others, and I have no doubt that in many instances the patients have been saved from a great risk. It is also very important in all cases to look for and remove a possible primary focus, such as enlarged tonsils, carious teeth, mastoid disease, etc., at the time that excision of the glands is carried out.

4. Suppurating glands. The conditions under which one meets with suppuration in the glands are various, and we may arbitrarily divide them into three groups.

(a) The abscess in the gland has burst through the fascia, but only forms a comparatively limited swelling under the skin. In these cases I advocate complete excision of glands, abscess, etc., in the manner to be presently described, an oval piece of skin being taken away over the abscess. In these cases it is usually necessary also to remove the jugular vein. Care should be taken as far as possible to avoid puncturing the abscess, although in many cases, if large, it is very apt to burst, and pus escapes over the wound; even when this takes place it is very remarkable that I have never noticed tuberculous infection of the wound. I have of course always washed the pus away immediately, but even doing that, if we judge from the result when a cancerous gland bursts, it is surprising that, in some cases at any rate, the wound does not become tuberculous.

(b) The abscess in the gland has burst through the fascia, and formed a large swelling under the skin with marked thinning of the skin over it. Under these circumstances the removal of the whole of the thin skin, which would be necessary in complete excision, would leave a gap which it is difficult to close, and the scar of which would be apt to stretch afterwards; hence, I prefer in these cases to open the abscess in the first instance, and then later on (in three or four weeks), when the skin has recovered and only a sinus is left, to carry out complete excision. In some cases it is well to scrape out the gland and abscess in the first instance instead of merely opening it, and it may be that this will suffice for a cure, but if fresh swelling appears excision should be performed as soon as the skin has recovered.

c. An abscess is present which has not yet burst through the fascia. Here one may in many cases wait and allow the abscess to increase till it is probable that the gland has become completely broken down, and then open and scrape out the abscess, inject iodoform and glycerine, and stitch up the wound again. A very small incision behind the sternomastoid frequently suffices in these cases, and the resulting scar is practically invisible. Cases, however, in which this result can be obtained are not very common and sometimes a sinus remains, and if it does will not heal, and if fresh glandular enlargement occurs excision should be performed.

5. Enlarged glands with sinuses. Here also excision is the best treatment, unless the sinuses are so numerous that the operation is not practicable. The operation is no doubt somewhat more difficult, but if it be carried out in the systematic manner to be presently described, I have never failed to complete it. Where the sinuses are too numerous for excision, thorough scraping and the subsequent application of undiluted carbolic acid is the best treatment.

Excision of tuberculous glands is an extremely satisfactory operation if carried out sufficiently widely. If the enlarged glands alone are removed, recurrence is very apt to take place, and this is more likely to happen if suppuration occurs in the wound. Under the latter circumstances the glands which are infected but not excised tend to enlarge and undergo suppuration.

I have already said—and I cannot emphasise the point too strongly—that in operations on tuberculous glands one must not be content with shelling out the infected glands, but must remove the whole of the glandular area, whether the glands are visibly affected or not. To shell out the enlarged glands is only to remove the most affected of the glands, leaving behind numerous others which are also affected but not markedly enlarged. It does not, of course, necessarily follow that these glands left behind will enlarge; but they

are more especially likely to do so if the operation has been an extensive one accompanied by much tearing of the tissues, and therefore with increased lymphatic flow, or accompanied by suppuration or even a less degree of inflammation. Under those circumstances the glands swell up and the tuberculous disease makes progress in them and generally forms fresh masses. And it must be borne in mind that a second operation in the same region is very much more difficult than the first on account of the cicatricial tissue distorting the relations of the parts. Hence, where glands are removed for tuberculous disease, one must map out and remove all the fat-containing small glands in that particular lymphatic area in addition to the enlarged ones.

The situation where one most commonly has to operate on tuberculous glands is in the anterior triangle of the neck, especially towards the upper part, and there one must remove not only the whole of the fat and fascia present in the anterior triangle of the neck, leaving the vessels, nerves, and other structures thoroughly clean, but if one is to avoid recurrence one must also thoroughly clean out all the tissues underneath the sterno-mastoid, so that the muscles on which the sterno-mastoid rests are completely bared. This cleaning-out process must extend backwards into the posterior triangle, and if glands are enlarged there one can very often by working from the front clear out even the greater part of the posterior triangle. In any case it is essential in removing glands from the anterior triangle, whether they be tuberculous or whether they be malignant, to remove all the material around the vessels, whether infected or not, and all the fat and glands underneath the sterno-mastoid. Especially with regard to the latter, the removal must extend quite up to the mastoid process, because very often glands enlarge about the region of the transverse process of the atlas, and the material there must also be taken away.

The following is the operation which I perform in all cases where the glands of the anterior triangle of the neck are enlarged and require operation:

The incision varies according to the extent of the disease and other circumstances. The one which I use most commonly is an incision commencing on the edge of the sterno-mastoid, from half an inch to an inch below the ear, and running downwards in the line of the anterior edge of the muscle to a point opposite the cricoid cartilage. In some cases, especially in females, or where the disease is not extensive, the incision need not run so low. Another incision where the disease is not very extensive, or, in the case of women, where the scar should be as little noticeable as possible, is a shorter and more curved one, so as to fall more in the line of the natural folds of the neck. The incision begins a little lower and also further back than the first, and curves downwards and forwards till it ends close to the larynx at or above the level of the middle of the thyroid cartilage. The elasticity of the skin allows of retraction to a sufficient extent to get good access to the part. In both these cases, if an abscess is present, the incision should be so planned as to include the abscess in an oval incision.

A third incision suitable for the extensive enlargements causing deformity, described under No. 2, and involving not only the anterior but the posterior triangle, in fact, the whole side of the neck, is that introduced by Dr. Beatson of Glasgow, which gives very complete access to the parts, and although extensive, is very little noticeable. This is a curved or horse-shoe shaped incision, beginning over the upper part of the anterior triangle, just in front of the sterno-mastoid muscle at a point opposite the angle of the jaw, running backwards to the posterior triangle, curving down the centre of that triangle to the lower part, and then forwards again to the anterior edge of the sterno-mastoid at the lower part. This large flap of skin being turned forwards, free access is obtained both to the anterior and posterior triangles. The resulting scar is scarcely noticeable from the front, and the greater part of it is readily concealed by the hair and collar of the dress.

Whichever incision be made in the skin, the dissection is then carried down through the fat to the deep fascia, and the skin and superficial fascia are separated and cleared off the deep fascia over the anterior triangle. One should begin by exposing the edge of the sterno-mastoid muscle along the whole length of the incision, and then when one has exposed

the sterno-mastoid muscle one can at its anterior border rapidly define the deep fascia, and then separate the tissues over the whole of the anterior triangle. Where a curved incision, such as has been described, is employed, it is also well to detach the skin and fat at the lower part of the wound for some distance, and then pull it down as far as possible by means of a retractor.

At the very lowest part of the wound an incision is then made through the deep fascia close to the edge of the sterno-mastoid muscle, and the jugular vein is defined. This is the key of the operation; the glands always lie close to the jugular vein, and are often adherent to the sheath of the vessel, and if one attempts to cut them out without previously seeing the vein, one may get into a great deal of trouble. But, by beginning at the lower part, below the area of enlargement of the glands, and exposing the vein and stripping up the common sheath, one can avoid any subsequent injury to the vein.

Having exposed the vein and divided the sheath, one can insinuate a separator, and in many cases also the finger between the sheath and the mass of glands. Where the vein is very adherent, and especially where the glands are very much matted together and suppurating, one is very apt to fail in getting the mass properly away by trying to peel it off from the jugular vein, and under these circumstances, the best plan is, having exposed the vein at the lower part, to ligature it in two places and divide it between the ligatures. Then, picking up the lower end of the upper part of the vein, insinuate the finger behind it so as to separate the vein along with the mass of glands forwards from the artery and vagus nerve. The loss of the jugular vein apparently does not make the slightest difference to the patient, and it makes all the difference as regards the ease of the operation, and also as regards the subsequent freedom from recurrence. Hence, probably, in the majority of cases—in all cases where there are sinuses, and practically all cases where suppuration is present—I make a point of dividing the vein between two ligatures and taking it away along with the mass of glands.

Having insinuated the finger either behind the vein or, if it is to be left, between it and the mass, one proceeds next to define the inner border of the anterior triangle. This can usually be readily done as the matting is generally more or less limited to the outer part, and by peeling the fat and glands from the carotid artery one can usually begin to divide the tissues upwards at the level of the side of the larynx. One or two large veins—namely, the superior thyroid, the lingual and facial veins, will be met with and, if the vein is being taken away, must be clamped before they are divided. These are freed and clamped in two places and then divided. The parts of the veins which run into the jugular vein being turned back with the mass. When the mass is turned outwards the vein can be seen running on its inner surface in cases where it has been divided below, and it should then be defined at the upper part, a ligature passed around it and tied as high as possible. The vein is then divided below that point, and the intermediate portion comes away with the mass. The descendens noni nerve can be preserved quite easily.

The next step in the operation is to ascertain the position of the spinal accessory nerve. This is usually readily done by turning back the edge of the sterno-mastoid and peeling off the fascia from its deeper surface; one very soon finds the point of entrance of the nerve towards the upper part, and can then usually pass the probe end of the separator upwards along the nerve, which often runs through the glandular mass, and thus define its course exactly. In most cases it will be found that the mass of glands is divided into two parts by the spinal accessory nerve; the largest mass is usually below it, but there is generally also a considerable mass above the nerve. Having defined the nerve, one tears asunder the glands over it so as to expose it throughout its whole extent. And then, keeping the nerve in mind, one proceeds to separate the glands at the upper part. In this region it will usually be found that the mass is fairly firmly attached to the fascia over the transverse process of the atlas. This should be next divided, and then the glands and fat can be pulled down. In some cases where this forms the chief part of the tumour this is not so easily done; and Mr. Stiles suggests that the sterno-mastoid muscle should be divided at the upper part so as to expose the region

thoroughly. This certainly gives excellent access to all the tissues underneath that muscle, and is of especial value in the removal of malignant glands. Having separated the glands in this situation, one continues with the finger and dissector to bring down all the fat and glands beneath the muscle as far back as the upper part of the posterior triangle. Usually, having separated the glands from over the transverse process of the atlas, the glands further back, along with the fat, can be readily peeled down. This peeling down of the fat and glands beneath the sterno-mastoid muscle is continued until one can pull them right down below the spinal accessory nerve. Having once drawn down the mass underneath the spinal accessory nerve, one pulls the sterno-mastoid outwards and the nerve upwards, and then proceeds to clean the under surface of the sterno-mastoid muscle and the muscles beneath it so as to remove the whole mass of fat and glands in one piece. It is well, after having cleaned the tissues for some distance, to ascertain the point of exit of the branch of the spinal accessory nerve which runs across the posterior triangle to the trapezius muscle, and to take care to preserve this from injury. In this way one can also pull out a quantity of glands and fat from the posterior triangle, and this should always be done, whether they are affected or not. When the mass is removed a clean dissection of the anterior triangle and the parts underneath the sterno-mastoid muscle should be seen. In some cases glands are also present beneath the vessels, and in peeling off the vein it is well to try and take these along with it; if not they should be removed subsequently, and one should always investigate whether there are or are not glands in this situation.

If one proceeds in this methodical manner the chances of recurrence in the anterior triangle are extremely slight as all the glands are removed. Recurrence may take place in the posterior triangle lower down or anteriorly in the sub-maxillary triangle, but recurrence rarely if ever takes place in the anterior triangle itself, more especially in the cases where the vein is removed along with the other tissues.

It is well to bear in mind one other point—namely, towards the upper part of the incision one is very apt to catch a little twig of nerve which runs down under the jaw to the lower lip. The result is that there is paralysis of a little bit of the lower lip close to the angle, so that when the patient speaks or laughs the lower lip goes rather to the other side. This trouble can hardly be avoided in bad cases, but the patient may make his mind quite easy about it, because I have never seen recovery fail to take place. In two or three months the whole thing has disappeared again, and I believe the trouble is more often due to the division of the platysma than to division of the nerve, and when the platysma has firmly united again, and the scar is getting loose, recovery is, as I have said, complete. So that, although it is a thing which it is well worth trying to avoid, if it does happen it is not an occurrence which need give one the slightest anxiety.

In cases where the gland has undergone suppuration and the skin is quite thin, if the abscess is not large it is well to include the thin skin in the incision, and to avoid as far as possible rupturing the abscess cavity while dissecting out the gland.

In other cases where the abscess is large, and where therefore a large amount of skin will have to be taken away, I believe it is best to divide the operation into two stages, and in the first place to open the abscess and put in a small drainage tube, and then, in the course of three or four weeks, when the skin has recovered, and we have only a sinus running to the glands, to operate with the view of removing them. In this way less skin is taken away.

Where sinuses are present, which are usually septic, it is well before beginning the operation to scrape out the orifice of the sinuses, but not to go far in, and then to sponge the surface with pure carbolic; in fact, I usually take a tiny piece of sponge which has been soaked in undiluted carbolic acid, and push it well into the sinus. The incisions are then so planned that the sinuses are included between oval incisions, and care is taken not to open them in the course of the operation. The result is that I have hardly ever seen infection of the wound occur even in operations with septic sinuses. At the same time where one has operated in cases with septic sinuses, it is well to put in a drainage tube for a few days in case infection should have occurred, because one cannot

under those circumstances feel anything like certain that infection will not take place. Where a drainage tube is employed it is well to perforate the skin behind the sterno-mastoid, and bring out the end of the drainage tube there; that allows the anterior incision to heal, and at the same time gives the most dependent point for drainage.

In cases where we have enlarged glands, both in the anterior and posterior triangles, which is often the case where the glands are causing a considerable amount of deformity, we may either remove these glands by two incisions, one such as I have described in front of the sterno-mastoid, and another running along the posterior border of the sterno-mastoid at the lower part, or employ the incision introduced by Dr. Beatson of Glasgow, which I have already described. When the flap has been turned forwards we can then proceed to the removal of the glands in the systematic manner just mentioned.

Where the posterior triangle alone is the seat of enlarged glands the main mass is usually just above the clavicle, and it can be removed either by a vertical incision running upwards and slightly backwards in the middle of the space, or by a triangular incision running backwards from the edge of the sterno-mastoid along the upper border of the clavicle to the trapezius, and then upwards along the edge of the trapezius. In any case the essential point in this operation is to take care of the branch of the spinal accessory nerve running to the lower part of the trapezius; and this is very often difficult to do, because the glands run especially along this nerve, and are very apt to completely surround it. So that the first part of the operation would consist in detaching the fascia from the posterior part of the sterno-mastoid and finding the point where this nerve comes out. Then, having defined the nerve at the anterior part, a probe is insinuated along it, and the tissues divided over the probe, so that in most cases, with a little care, one can lay bare the nerve in its whole extent, and, having done so, free it and avoid injury to it afterwards.

At the lower part one will generally find that the glands run beneath the sterno-mastoid, and are attached to the jugular vein. In fact, when one pulls on the mass one can generally bring the jugular vein out behind the sterno-mastoid. Here the vein should be defined at the upper part, and then the sheath divided and the mass of glands detached from it. On the right side there is very little trouble about doing this quite satisfactorily; on the left side, at the lower part, one must bear in mind the presence of the thoracic duct, and avoid injury to it, for the glands are very apt to be pretty adherent in this region. One may also, in pulling the glands away too violently, pull out large lymphatic branches entering the duct, and so leave holes which may leak. Under the latter circumstances one need not be anxious, for though chyle may escape, still in the course of a short time the hole closes, and there will be no further trouble.

In cases where the glands affect the submaxillary region a curved incision from the centre of the lower jaw, carried downwards to the hyoid bone and then backwards and upwards to the angle of the jaw, will usually expose the whole area. In many cases the glands are very closely adherent to the submaxillary gland; and while one should always try to leave this gland if possible, in some bad cases it may be necessary to take it away. There is no particular point about this operation. It is a perfectly simple one. One may injure the facial vein and even the artery, but they are quite easily secured if necessary.

I need not discuss the extirpation of tuberculous glands in other regions. In the axilla one would make a curved incision, and turn down a flap from over the floor of the axilla and clear out the space. In the groin one must sometimes make T-shaped flaps; in other cases a curved flap with the convexity downwards below Poupart's ligament will expose both femoral and inguinal glands.

LEPROSY IN CRETE.—Prince George of Greece, Commissioner-General of Crete, has invited Dr. E. Ehlers, a Danish physician who some years ago investigated leprosy in Iceland, to undertake a similar mission in Crete. It is estimated that there are from 2,000 to 3,000 lepers on the island. Dr. Ehlers will accordingly visit Crete this winter, and his inquiry will probably be extended over three or four months.