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ON THE TREATMENT OF TUBERCULOUS GLANDS IN THE NECK.

SECTION OF DISEASES OF CHILDREN.

*At the Annual Meeting of the British Medical Association in
Carlisle, July, 1896.*

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TUBERCULOUS disease of the cervical glands gives rise to such very different morbid conditions, and presents itself clinically in such diverse forms, that no one line of treatment can be expected to suffice. Each case must be considered and treated on its own merits. Although in tuberculous adenitis it is the particular morbid condition which exists which mainly determines the treatment, there are nevertheless a number of secondary factors to be taken into account, and the value of each correctly estimated, before judgment be pronounced as to the particular line of treatment or operation to be adopted. For instance, the extent of the disease, its duration and progress, the previous treatment and its results, have all to be taken into account. Another important point is whether the glandular affection is a part of a general tuberculosis or purely a local condition. If the latter, the primary source of infection must be sought for and removed whenever possible. That the disease should be so often localised to the glands of the neck is not surprising, when we remember the frequency with which surface lesions exist in children in connection with the mouth, the naso-pharynx, the tympanum, the conjunctivæ, and the skin of the head generally. It is more than probable that the prevalence of tuberculous glands in the neck in children is intimately associated with the special development of adenoid tissue at this period of life, and with the frequency with which inflammatory processes are met with in connection with the faucial and pharyngeal tonsils, and with the decay of the milk teeth.

Formerly the teeth were regarded as the most frequent and important source of infection. Within the last few years the tonsils, which Virchow taught were peculiarly exempt from tubercle, have been shown to be a frequent seat of it, and, along with the naso-pharyngeal and lingual adenoid tissue, they are now regarded as a more important source of infection even than the teeth.

While admitting the primary importance of the naso-pharynx as a source from which the deep cervical glands become infected, I am inclined to attribute considerable blame to the teeth as a source of infection of the sub-maxillary glands.

Starck¹ examined 113 children (aged three to twelve years) with tuberculous cervical glands, and came to the conclusion that in 41 per cent. no source of infection could be discovered other than carious teeth, which were present in 80 per cent. of the cases.

With regard to the treatment of the various primary sources of infection, the surgeon should regard it as a part of the treatment of the glandular condition, to be carried out either before, concurrently with, or after, that of the glands, as may seem most desirable. If this is not done recurrence is almost certain to take place. I think the difficulties and dangers of removing adenoids have been made too much of, and that their existence is largely theoretical. Personally, I look upon removal of adenoids as one of the simplest and safest operations in surgery.

Before deciding as to the nature of the surgical treatment to be adopted, the surgeon must first ask himself the following questions. In what form does the tuberculous condition in the gland exist? Is it mainly an inflammatory hyperplasia with but little caseation, or has the gland undergone more or less complete caseous or purulent softening? That is to say, is it practically a tuberculous abscess? These questions can only be answered after making a careful physical examination. But the point I wish to lay stress upon is, that complete purulent softening often exists without evincing itself by the physical sign of fluctuation, but by what, to the experienced finger, is a sign of equal importance, namely, a characteristic elasticity.

If the gland has already become converted into a caseous or purulent abscess, then it would be a mistake to begin the operation under the idea that it was solid and should be excised; the result of such an error would be a much larger wound than necessary, and probably one which would not heal by first intention, on account of having been inoculated with the tuberculous contents of the gland.

Before discussing whether the solid gland should be excised, or left to soften, I may first describe the treatment I employ for tuberculous glandular abscesses. Briefly stated, the steps of the operation consist in:

1. Incision.
2. Thorough scraping with a Volkmann's spoon.
3. The application of pure liquid carbolic acid to the wall of the cavity.
4. Stuffing with iodoformised worsted.

1. *The Incision.*—Here I would strongly advocate the teaching of Kocher², namely, to make all such incisions parallel to the skin creases, that is to say, more or less at right angles to the long axis of the neck. As regards the size of the incision it need not be large, but unless the abscess be very small, it should at any rate be large enough to admit the finger.

2. *Scraping.*—The contents having been squeezed out as far as possible, the cavity should be thoroughly scraped with a Volkmann's spoon, the finger being introduced from time to time to ascertain the condition of the wall. The scraping should be continued until all the caseous or purulent matter has been removed; and when this has been done the wall of the cavity, which consists of the thickened capsule of the gland, and corresponds to the outer or

¹ *Münchener med. Woch.*, February 18th, 1896.

² *Textbook of Operative Surgery*, translated by H. J. Stiles, p. 21.

fibrous layer of the so-called pyogenic membrane of tuberculous abscesses elsewhere, will often feel as smooth as that of a cyst. The danger of hæmorrhage from scraping into veins has, I think, been exaggerated. The outer fibrous layer of the capsule of the gland affords an efficient protection against opening into veins; moreover, it is very difficult to scrape through healthy tissues with a sharp spoon.

3. *Application of Carbolic Acid.*—Since the publication of Professor Watson Cheyne's book on the *Treatment of Wounds, Abscesses, and Ulcers*, in which he speaks so highly of the value of pure liquid carbolic acid for producing immediate asepsis of septic tuberculous ulcers and sinuses, I have made extensive use of this agent. I very soon became satisfied of its value, and I now apply it as a matter of routine, not only to septic tuberculous ulcers and sinuses, but to the walls of every caseous and purulent gland after thorough scraping.

4. *Stuffing with Iodoform Worsted.*—For the purpose of stuffing I employ, not gauze, but freshly prepared iodoformised worsted.³

The advantages of the worsted over the gauze are:

1. That it is softer, more elastic, and more absorbent.
2. That it more readily drains away the blood-stained serum by capillarity.
3. That every corner of the cavity can be more easily packed by it, and it is infinitely more convenient for stuffing sinuses.
4. That it can so easily be freshly prepared.

There is not the very slightest degree of sloughing as the result of the application of the carbolic acid; indeed, except for the clean and dry condition of the wound it would be impossible to tell that this substance had been applied. The cavity soon fills up with healthy granulations, and a small linear or depressed cicatrix is the result. Since employing this treatment I have seldom met with persistent sinuses, and consequently I now very frequently adopt it in cases in which formerly I used to excise the thickened and adherent capsule.

It frequently happens that the gland, after becoming adherent to the cervical fascia, bursts through it and gives rise to a subcutaneous abscess. In all such subcutaneous tuberculous collections the surgeon should open the abscess by a moderately free incision and make a careful search for the opening, which, as Mr. Teale has pointed out, will invariably be found to exist in the deep fascia, and to lead to the caseous remains of the gland from which the abscess (or ulcer) has originated.

There are two situations in which caseous and purulent tuberculous adenitis is more troublesome to deal with. The one is behind the pharynx, the other is in the pre-auricular region. Of the different varieties of retro-pharyngeal abscesses, that resulting from tuberculous adenitis is, in my experience, the one most commonly met with in children.

There are three routes by which these abscesses may be reached; namely, by the mouth, by an incision at the pos-

³ Known in the trade as white double Berlin wool. It is treated as follows: (1) Boil for twenty minutes; (2) wring out of a 1 in 1,000 solution of corrosive sublimate; (3) cut into lengths of about 18 inches; (4) with carefully disinfected hands rub in sterilised iodoform, preferably the crystallised variety, previously reduced to a coarse powder.

terior edge of the sterno-mastoid (Chiene), or from the anterior triangle (Burekhardt).⁴ Chiene's is undoubtedly the best method, and should be employed whenever possible. The great advantage of this method over the old plan of opening the abscess by the mouth is that the abscess can be treated aseptically.

On one occasion I was prevented from employing Chiene's method by the presence, along with the retro-pharyngeal glandular abscess, of a large number of tuberculous glands which were very adherent to the surrounding structures, and through which the dissection would have had to be made.

I made a transverse incision very similar to that for ligation of the lingual artery, and dissected down through the carotid division of the anterior triangle, towards the greater cornu of the hyoid bone and the middle constrictor of the pharynx, in front of the external carotid, and between the origins of the lingual and facial arteries. Even after reaching the floor of the triangle, I had considerable difficulty in making out the exact position of the abscess, on account of the absence of distinct fluctuation; the difficulty in eliciting it being due to the fact that the finger pushed the abscess bodily before it towards the cavity of the pharynx.

The second situation in which tuberculous adenitis sometimes gives trouble is in the pre-auricular region. The gland here lies under the facial prolongation of the cervical fascia, and in close relation, therefore, to the parotid gland and the facial nerve. This gland, when tuberculous, soon becomes adherent to these structures, as well as to the skin, so that it is seldom advisable to excise it. I have had two cases in which a salivary fistula followed the operation of scraping the gland. I am now always careful to scrape it through a very limited incision made at its lowest part. Should the gland be only slightly caseous, or solid throughout, and large enough to give rise to deformity; if it has existed for several months, has been uninfluenced by tonic and hygienic treatment, by the removal of the local source of irritation and infection, and is still moveable, it should certainly be excised. It can easily be "shelled out" through a small opening, and if the operator makes his incision along one of the natural creases, the resulting scar will be no disfigurement, and will in course of time become practically invisible. There can be no doubt, I think, that excision—"shelling out"—is the proper treatment, because, with a very trifling operation, and a scar which is practically invisible, the patient is completely, and at once, rid of a disease which might at any time become a source of further infection. Much of what has been said with regard to a single movable gland, is true also of a single well-defined and movable bunch of glands.

The excision of these is a very simple operation. The great point is to proceed as in removing a simple tumour—namely, to cut down to the true capsules of the glands, and to keep to them.

More frequently, however, the mass, although apparently freely movable, will be found by the operator to be adherent, more especially to the veins, and frequently also to the nerves. In the submaxillary region, for example, the glands will be found to lie upon, and to be more or less adherent to, the common facial vein, close to its junction with the internal jugular, so that if the glands be pulled forwards out of a too

⁴ *Cent. f. Chir.*, 1884, p. 57.

limited incision, and the knife or scissors used blindly to divide the remaining deeper attachments, the vein is almost certain to be opened close to the jugular, and troublesome bleeding will be the result. A clear view, therefore, should be obtained of every structure before it is divided, and care should be taken not to mistake stretched veins for bands of fascia.

A blunt instrument should be used to separate the glands from adherent veins. I am indebted to Professor Watson Cheyne for directing my attention to the value of Greville Macdonald's nasal periosteal detacher for this purpose. The nerves, from the density of their sheaths, can be freed and drawn aside without difficulty. Of the large nerves in the neck, the spinal accessory, as it crosses the internal jugular vein and lies under the sterno-mastoid, is most likely to be injured by the incautious dissector.

Should one of the glands have softened so that fluctuation can be felt over it, it should be dealt with by scraping and the application of pure carbolic acid before proceeding to excise the mass, for in this way infection of the rest of the wound may be prevented. The preliminary incision for this purpose should, if possible, be planned so as to form part of the main incision, and as this part of it is not likely to heal by first intention, an iodoform wool drain may be brought out through it, and the remainder of the wound sutured.

The importance of obtaining primary union and as fine a cicatrix as possible is obvious. Unless care be taken, the hair and the chloroform mask may be the means of infecting the wound. A soft gauze bandage which has been sterilised and wrung out of an antiseptic solution should be applied to the head, so as to completely and securely cover in all the hair. This is less apt to slip than a towel. For swabbing the wound I prefer sterilised artificial sponges made of double Berlin wool cut into small pieces and tied up in thin gauze; these are almost as elastic as ordinary sponges, and are infinitely better than pieces of gauze.

Accurate apposition of the edges of the wound is best obtained by a continuous suture of horsehair or fine silk, the assistant meanwhile raising the edges and putting them on the stretch by means of a fine sharp hook introduced skin deep at each extremity. More or less of a cavity will be left after the glands are removed, and on this account the tendency of the edges to become inverted is very great. It may be necessary, therefore, to make use of a second or return continuous suture introduced superficially, and close to the edges. A fine and a fairly long straight bayonet-pointed needle is the speediest instrument for introducing the sutures, and it has the further advantage of making small punctures. If care be taken to arrest all bleeding, and if the surgeon's technique as regards wound treatment is such that he can afford to dispense with strong antiseptic solutions, there is no need for a drain. The wound should be kept well supported by an elastic and absorbent dressing. One of the wool sponges, on account of its elasticity, makes an excellent "deep dressing."

It must not be supposed that I advocate excision in all cases. In young children there are many instances in which excision is not to be recommended, whereas in adolescents and adults I think it should be the rule, whenever the disease is localised to the neck. In children, infection is generally

going on from some local source, so that the disease in the glands is more active, and finds a natural vent by purulent softening and abscess formation, while at the same time this renders complete excision very much more difficult, in consequence of the extensive matting and adhesions to surrounding important structures. Given, for example, a mass of tuberculous glands in the parotid region and under the upper part of the sterno-mastoid in a child with tuberculous disease of the middle ear, it would surely be an unwise proceeding to subject the patient to a severe operation for the removal of the glands, as long as the primary source of the mischief is allowed to go on in the middle ear. If the otorrhœa has persisted for several months, and if tubercle bacilli be found in the discharge—as they may readily be—then the right thing to do, in my opinion, is, in the first instance, to open the mastoid, clear out the middle ear, and stuff with iodoform wool. In fact, the case should be treated on the same lines as in other tuberculous bone lesions. I can recall cases in which, after adopting this course, and scraping out one or two small abscesses which had formed in the more superficial glands, the glandular disease gradually disappeared. There can be no doubt that extensive tuberculous adenitis in children not infrequently disappears after opening and scraping merely those glands which have undergone caseation or purulent softening.

Lastly, in reference to cases in which the disease in the neck is very extensive, excision is seldom, if ever, to be recommended in very young children; but the older the child the more must the question of complete excision be entertained. It may not be possible to accomplish this at one operation. Indeed, it is often advisable to do one side of the neck at a time, and even three operations may be required before the disease can be completely eradicated.

If the patient be at all approaching adolescence, and be in good health otherwise, if the disease have been of long duration, exist in a chronic form, and have resisted all other treatment, and if there be no persistent source of primary infection, excision should be recommended.

In cases in which practically the whole of the anterior and the greater part of the posterior triangle are occupied by a large mass of glands, the operation will be rendered less difficult, and at the same time more complete, if the plan recommended by Cheyne⁵ be adopted. Mr. Cheyne says; "If the removal of tuberculous glands is to be a success, it must be done very much more thoroughly than is commonly the case. . . . The removal of the vein along with the glandular mass renders the operation very much more easy to accomplish, because once the vein is exposed and divided between the ligatures at the lower part of the mass in the anterior triangle, the whole of the glands can usually be very readily peeled up from the structures behind, and it is quite easy to pass a needle round the jugular vein close to its exit from the skull and ligature it again before detaching the mass."

I have had the privilege of witnessing Mr. Cheyne perform the operation upon a young man, the subject of the disease in a very aggravated form. I was much impressed with the ease with which the deepest glands could be removed by stripping up the internal jugular vein along with them. Here (specimen shown) is a mass of glands which I removed from

⁵ *King's College Hospital Reports*, vol. i.

the neck of a girl aged 15. Adherent to the deepest chain of glands is the greater part of the internal jugular vein. The glands occupied the whole of the left anterior triangle, and extended under the sterno-mastoid into the posterior triangle, where they formed a chain along the posterior edge of the muscle. The right side of the neck was affected to a considerably less extent, so it was decided to operate on the left side in the first instance. The operation was performed as nearly as possible as I had seen Mr. Cheyne do it. One of the glands in the anterior triangle had formed a small abscess, over which the skin was thin and reddened. Having incised, scraped, and swabbed this out with pure carbolic acid, so as if possible to prevent infection of the parts to be subsequently exposed, I extended the incision along the whole length of the anterior border of the sterno-mastoid muscle from the middle of the mastoid process down to, and for a short distance over, the manubrium sterni. After defining and retracting the sterno-mastoid, and removing the more superficial glands from the submaxillary region, the spinal accessory nerve was freed from a bunch of glands and carefully drawn aside. The deeper glands were then followed downwards in front of the carotid sheath to the root of the neck, care being taken to preserve the descendens noni nerve. Having got below the glands, the internal jugular vein was exposed immediately above the clavicle, isolated, and divided between two ligatures. With the aid of the blunt dissector, the vein, along with a cluster of glands firmly adherent to it, was gradually separated up from the carotid vessels and the vagus. As the tributaries of the vein were encountered they were double-ligatured before being divided. The next step—of which Mr. Cheyne is careful to emphasise the importance, if recurrence is to be prevented—consisted in the removal of all the small glands lying partly beneath the sterno-mastoid and partly in the posterior triangle. With the sterno-mastoid freed from its origin to its insertion, no difficulty was experienced in retracting it sufficiently to allow of the complete removal of these glands. They were gradually separated from the branches of the cervical plexus, special care being taken to avoid injuring the phrenic nerve. The only structure which gave any trouble at this stage was the upper part of the spinal accessory nerve, which, more than anything else, interfered with the retraction of the sterno-mastoid. I am convinced, however, that the division of this muscle is very rarely called for, provided it be exposed for a sufficient extent. The wound was closed by two continuous silk sutures, two drainage tubes being inserted, one into the lower part of the wound, the other upwards into the upper part of the anterior triangle, through a special opening at the posterior border of the sterno-mastoid muscle. The tubes were removed at the end of forty-eight hours, the stitches on the seventh day. The wound healed by "first intention," with the exception of the small area over the gland which had suppurated.

Mr. Cheyne's plan appears to me to possess distinct advantages. It takes much less time to resect the jugular along with the glands adherent to it than to dissect them off the vein. In attempting to do the latter the jugular is almost certain to be wounded or lacerated, in which case considerable time may be required before the hæmorrhage can be sufficiently arrested to allow the surgeon to proceed with the operation. If the opening into the vein be a comparatively

small one, it may be closed by means of a lateral ligature; but it should be remembered that this plan is attended with a certain amount of risk from the possibility of the ligature slipping, should the vein become suddenly distended by vomiting, coughing, or struggling. This accident happened on one occasion to myself, just as I was about to stitch up the wound. The assistant had allowed the patient "to come out of the chloroform," and as soon as he began to cough and struggle, the lateral ligature, which I had placed on the jugular, slipped, and severe hæmorrhage was the result. This was all the more difficult to arrest, in consequence of the comparatively small size of the wound, which I was reluctant to enlarge, having promised that the scar should not be a long one. I need hardly say that such a promise should never have been made, because it is impossible to say, from external examination, to what extent the glands may be adherent to the deeper structures. In more extensive operations, when a ligature is applied at the outset, to the internal jugular at the root of the neck, the vein itself, as well as its branches, is kept distended with blood, so that there is no possibility of mistaking them for bands of fascia. They stand out prominently, and can readily be double-ligatured before they are divided. In this way the wound is kept comparatively dry during the whole operation, so that the operator can see exactly what he is doing. And resection of the jugular, while it renders the operation more complete and satisfactory, and less liable to be followed by recurrence, in no way adds to its risk or severity; on the contrary, it materially simplifies it.

Before operating on these advanced cases, everything should be done in the way of change of air, tonics, and, if necessary a splint for the neck, so as to bring the patient's general health up to as high a standard as possible. Such treatment frequently has a markedly beneficial effect upon the glands themselves. I have seen glands which were very large, tender, and extensively matted, diminish to half their size, as well as become very much more movable, under the administration of gradually-increasing doses of arsenic and creasote, and I am satisfied that the greater number of the cases which used to be regarded as lymphadenoma, and which benefited so much from arsenic, were in reality tuberculous. I have had several opportunities of demonstrating this fact with the microscope.

Within the last two or three years Professor Chiene has in doubtful cases removed one or two of the glands for diagnostic purposes, with the result that in every instance they were found to be tuberculous. I remember one case in particular in which this was done in a young and anæmic man, with all the symptoms of lymphadenoma. The glands which were removed, although considerably enlarged, showed no traces of tubercle to the naked eye, so that the case was thought to be one of lymphadenoma. On microscopic examination, however, they were found to be full of typical giant-celled systems, though no caseation existed.

I have seen tuberculous glands the size of a pullet's egg which showed no trace of caseation. Such glands are often erroneously spoken of as examples of simple lymphomata. Moreover, the microscope has also shown me that non-caseous glands may be tuberculous although but little larger than a grape-stone, a fact which shows the advisability of removing them.