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THE TREATMENT OF TUBERCULAR GLANDS OF THE NECK.*

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In Colorado everything pertaining to tuberculosis is of such importance that I have no hesitation in presenting this subject for your consideration, particularly as it has not been previously discussed in this society—so far as I am aware.

GENERAL CONSIDERATIONS.

The neck, as a whole, contains several hundred lymph glands, some of them superficial and some deep. Although their distribution is general, they exist principally in definite groups. Certain of these groups are particularly liable to tubercular disease, owing to their close connection with the entrance points of infection, such as the tonsils, teeth and pharynx. Chronic otitis, eczema of the scalp, ophthalmia, and various nasal troubles are also sources of infection, while in isolated instances germs may be deposited from the blood or ascend from the bronchial lymphatics.

It is a progressive disease, one gland sooner or later infecting others, a point of importance in selecting a rational form of treatment. The nodes most frequently affected are those in the submaxillary region and those lying along the internal jugular vein, in front of, behind and beneath the sterno-mastoid muscle. The submental and parotid regions are at times implicated, as well as the areas in the vicinity of the mastoid and above the clavicle. Towards the back of the neck infection is less frequent. The seriousness of tuberculosis of the cervical lymphatic system is generally underestimated. Chronic swellings in the neck are so common that they are not given the attention they deserve. To be sure, the danger is much less than in pulmonary affections, but, nevertheless, the enemy is there and prepared to invade some vital organ if opportunity arise. A considerable proportion of cases, from 10 to 25 per cent. according to Dowd, develop phthisis; while some die of meningitis or of general tuberculosis, and in others tubercular foci appear in various parts of the body. (A short time ago, for instance, I examined a boy of five with hip-joint disease closely following enlargement of the cervical lymphatic glands). To these dangers must be added the chances of repulsive deformity and unsightly scars.

Treatment is both general and local, the latter being divided into non-operative and operative.

GENERAL TREATMENT.

This is of the utmost importance, and is always indicated, sometimes for its curative effects in the early stages, but more frequently as a safeguard against relapse following an operation. It comprises both medicinal and hygienic measures.

Medicinal.—Under this head come principally cod-liver oil, the syrup of iodid of iron, the hypophosphites, creosote, guaiacol, etc., although it is questionable that much effect is obtained from any of them. The various forms of tuberculin are not only ineffective, but by some are considered dangerous when used for a longer time than is required to establish a doubtful diagnosis.

The employment of cinnamic acid and other so-called specifics has not been attended by sufficient success to justify their general recommendation. As far as can be judged at present, the question of medication seems to be more nearly related to a building up of the resisting powers of the patient than to any specific drug action upon the germ.

Hygienic.—Most cases of tubercular adenitis develop in the young under bad hygienic surroundings—in the slums, tenements and sweatshops of large cities, and wherever people are overcrowded, overworked and underfed, with lack of sleep, fresh air and sunshine. Hence, if we wish to obtain favorable results in the cure of the disease and in the prevention of relapse, too much attention can not be given to hygienic measures. In fact, these are relatively of as much importance as in the treatment of pulmonary lesions.

It has long been observed that these patients do remarkably well at seaside resorts—for instance, at Berck-sur-Mer, as reported by Calot. So thoroughly is this recognized that seaside governmental stations have been advocated. I believe, however, that a high, dry climate, such as that of Colorado, offers more advantages than the seashore in the treatment of surgical tuberculosis. It is well established, for instance, that tubercular bone lesions are much less frequent in Colorado than in most lower altitudes; and although I can give no statistics, I have reason to think this is true of glandular tuberculosis also. During a surgical experience of over seven years in Colorado, I have seen nowhere near so many glandular enlargements as I observed in an equal length of time in Cincinnati; and the cases have not been, on an average, so virulent. In short, there is reason to presume that our rarefied, dry and stimulating atmosphere, our sunshine, and our relatively outdoor existence, do more toward fortifying the resisting power of the body against lymphatic tuberculosis than does a residence at the seashore; a fact which we have

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long recognized, but have failed to emphasize as it deserves, our principal attention having been directed to troubles of a pulmonary nature.

LOCAL TREATMENT.

Non-Operative.—In order to promote cure and prevent relapse, it is of prime importance to abolish, if possible, the sources of infection—by attention to teeth, tonsils, pharynx and nose, and by the eradication of inflammations of the ears and scalp. The importance of the teeth has been demonstrated by Starck and by Koerner, the former finding decayed teeth in 41 per cent. of cases and the latter in 73.8 per cent. Starck also detected tubercle bacilli in old cavities in several instances. Goodale even asserts that many enlarged glands can be made to disappear merely by treating the tonsils with solutions of iodine, but this has not been substantiated to any extent by others.

Massage and such methods as crushing of the glands between the fingers or their subcutaneous division with small knives have been abandoned as ineffective and dangerous, because favoring local and general dissemination.

Ointments and counter-irritants are still in extensive use, although their utility is, to say the least, doubtful. As ointments, ichthyol, resorcin, and the iodide of lead are probably the best. The most reliable counter-irritants are tincture of iodine and green soap.

Trojanow, who has had a large experience with various forms of local treatment, places more faith in the application of heat (hot-water bag for an hour or two each day) than in anything else, but nevertheless, his results have not been brilliant.

The *x-ray* has not yet had its utility established, although some encouraging cures have been reported.

The *interstitial injection* treatment has been advocated for many years. Some substances are employed for their supposed direct curative effects, such as tincture of iodine (5 to 10 drops every four days); Fowler's solution in increasing doses (8-10-12 drops); solutions of carbolic acid, alcohol, acetic acid, nitrate of silver, corrosive sublimate, guaiacol, phosphate of iron, etc. Also camphorated naphthol, balsam of Peru, oil of cinnamon, cinnamic acid, iodoform, etc. Other substances, such as chlorid of zinc (2 to 10 per cent.), stronger solutions of carbolic acid, papain, etc., are used for the purpose of causing a rapid breaking down of the glandular substance, which is supposed to facilitate more effective treatment. The method of Calot, for instance, is to inject 2 per cent. chlorid of zinc, with a hypodermic syringe, every second day, until purulent softening takes place. The fluid is then aspirated and replaced with camphorated naphthol.

These procedures, although strongly advocated by their supporters, have given rise to disappointment in the hands of others. They are unreliable and not free from discomfort and ever danger, as proven by cases of poisoning from camphorated naphthol.

Iodoform (10 per cent.) dissolved in ether (Verneuil) or suspended in olive oil or glycerin (Krause), probably forms the best material for injection. The oil must be boiled and cooled; and before stirring in the iodoform, it must be sterilized by soaking for twenty-four hours in 1-1000 corrosive sublimate. Into glands which have not yet broken down, about half a hypodermic syringe-full is inserted every eight to ten days, while glands containing fluid are aspirated and then filled with the emulsion. Even this method leads to more failures than successes and wastes time.

In estimating the value of the injection treatment, it must not be overlooked that although certain glands

may disappear, there are nearly always others which can not be reached or even recognized without a surgical operation, and these are only too apt to give rise to trouble in the future.

Electrolysis and the use of electricity in other ways have never attracted much attention, and the same may be said of subcutaneous curettement.

The concurrence of medical and surgical opinion is that the non-operative treatment of tubercular adenitis is unsatisfactory, except in incipient cases, where the glands are still small, movable and undegenerated; but these are the cases which, like the early stages of cancer, are seldom seen.

Operative Treatment.—The majority of cases are best treated by operation, unless the general condition of the patient forbid. The presence of tuberculosis elsewhere, even in the lungs, is, however, no contra-indication, except when far advanced. If operation were refused all consumptives in Colorado, as has been advised in the East and abroad, much injustice would be done both patient and surgeon. Every-day experience shows that phthisic cases take chloroform so well, at least in Colorado, that little danger is to be anticipated from its use, and the removal of glands may give a much needed impetus towards recovery.

Curettement is applicable to sinuses, to tubercular ulcers of the skin, to cases in which during a radical operation the extirpation of a gland is attended by too much danger, and to cases where the condition of the patient precludes extensive surgical intervention.

The results are good provided all the diseased tissue can be removed; hence, the greater the disintegration of the glands the better. It is at times almost impossible, however, to scrape away all the tough glandular substance from within its adherent capsule, and to go outside this barrier may be dangerous in the extreme.

The method has its shortcomings, and must be employed with caution. It is easy, for instance, to scrape a hole in the internal jugular, which is so often adherent to caseous masses. In addition, it is impossible to reach and destroy all the affected glands, while the excessive traumatism may disseminate the disease.

Cauterization of sinuses, after curettement, with pure carbolic acid, applied with cotton on a probe, and repeated at intervals of a few days, often promotes healing to a decided degree, but the injection of iodoform is of little service. The ragged, undermined and livid tubercular skin around the opening of a sinus must be scraped away in order to facilitate rapid healing.

Although so strongly recommended by Treves, the cauterization of glands by plunging into them the tip of a thermocautery has been practically abandoned in favor of radical operative measures. The same may be said of the use of the seton.

Complete extirpation dates back to the time of Galen, and was extensively practiced by Parré and Larrey. It may be easy or it may be one of the most difficult operations in surgery. Nearly always many more glands must be removed than were counted on beforehand. They often appear one after another in the wound in apparently endless profusion, so that what promised to be a simple excision of one or two movable lymph nodes turns out to be an extensive, complicated and serious intervention. No one should attempt an operation of this kind lightly, without a thorough knowledge of the anatomy of the parts, and a full command of the best surgical technic.

When the operation is once begun, it should be made as complete as possible. If any diseased glands are left

they are likely to give rise to future disturbance, although the slightly affected ones may, under proper hygiene, remain quiescent. This is fortunate, because it may be impracticable to follow all the eccentric ramblings of the tubercle bacillus throughout the intricate maze of lymphatic structures in the cervical region, Betagh even claiming that the fat is sometimes infected.

In simple cases, where a single movable gland or a small bunch of glands is to be removed, a short incision is sufficient, which can be stretched, if necessary. Transverse scars, although often objectionable for other reasons, have less tendency to spread and become hypertrophied than longitudinal ones. Transverse scars in the submaxillary region are at times almost invisible.

But in the majority of instances, where operations are required at all, they must be so extensive that small incisions are out of the question. No greater surgical indiscretion can be made than to attempt to remove a number of enlarged, matted and adherent glands through a small opening. Plenty of room must be secured, even at the expense of extensive scars.

Incisions of many forms have been devised by various operators. Nearly all are efficient so far as room is concerned, but many occasion unnecessary disfigurement. This is sometimes true of the "S"-shaped incisions of Hartley and of Senn, which pass transversely beneath the jaw to a point beyond the mastoid, then curve downwards and forwards across the sterno-mastoid, and finally backwards parallel to the clavicle. In most instances enough room is obtained by a transverse submaxillary cut extended in a curve over the upper portion of the sterno-mastoid and then straight down along its posterior border. If, however, according to Dowd, the horizontal incision is carried backwards to the hair, and then curved downwards along its edge, a large skin-flap is formed which gives excellent approach to the enlarged glands. If necessary, the incision may be curved forward above the clavicle. The resulting scar is not conspicuous, especially from the front.

Dollinger advocated operating through an incision placed entirely within the hair back of the ear, which is undoubtedly possible in selected cases, but desirable in very few, on account of difficulty and danger.

The slightest consideration makes it evident that no formal incision can be universally employed. The skin must be divided to suit the case—sometimes in one direction, sometimes in another, following natural lines of cleavage and concealing scars as much as is consistent with thoroughness and safety. The subcutaneous suture should be used whenever practicable, as it not only does away with unsightly stitch holes, but prevents the annoying turning in of the edges of the skin.

Although the division of the sterno-mastoid muscle, with subsequent reunion, facilitates ease and safety in operating, it is seldom necessary and should be avoided, if possible, as it may lead to deformity. Retraction of the muscle is usually all that is required.

Theoretically, it is best to remove the glands, their capsules and surrounding fatty tissue in one mass. Practically this is not always possible. Portions of capsule or even of glands may have to be left behind rather than run the risk of injuring important structures. Even in the most skilled hands these operations are frequently so long and tedious as to try the patience and endurance of the operator to the utmost.

The jugular vein should be at once exposed in difficult cases, either above or below the glandular mass. Its situation is then known, and it can be freed from abnormal attachments with considerable safety. It is

seldom necessary, as advocated by Stiles and others, to divide the vein between ligatures and remove a section along with the diseased tissues, or even to apply temporary ligatures with the idea of tightening them if required.

Injury to the jugular is not very uncommon. It generally occurs while the tissues are being pulled upon, thus stretching the vein and emptying it of blood, when it is easily mistaken for fascia and divided. Hence it is advisable to relax all deeper tissues before cutting.

Hemorrhage from a wounded jugular is alarming, but seldom fatal, for it can easily be controlled by pressure until ligatures, forceps or sutures have been applied. It is sometimes wise to leave the forceps *in situ*. The greatest danger, perhaps, lies in the entrance of air into the circulation. I have seen this on two occasions and fully realize its importance. Prompt closure of the opening with a finger is the best safeguard. The carotid arteries are much less liable to injury than the jugular vein, because their walls are thicker and their presence more readily detected by their pulsations.

Various nerves, however, must be constantly watched for by the operator. The one most exposed to injury is the spinal accessory, as it emerges from the sterno-mastoid muscle near the center of its posterior border. Although denied by some (Milton), the division of this nerve usually results in more or less atrophy and paralysis of the trapezius, which is noticeable in inequality of the shoulders and impairment of motion. If the divided ends are reunited with catgut, function may be restored within a few days. In one case I was unfortunate enough to cut this nerve in two places. Immediate suturing resulted in the reappearance of power in the trapezius within a week. In another instance about ten days elapsed before the shoulder could be spontaneously elevated. In the light of personal experience, I should not hesitate to deliberately divide the spinal accessory, when necessary, with the idea of reuniting it before completing the operation. It is readily detected by rubbing some blunt instrument firmly across the wound and noting the jerking of the shoulder when the nerve is touched.

The pneumogastric, phrenic, laryngeal and sympathetic nerves are well out of the way in most operations and are seldom injured. Division of the phrenic is a serious accident, but the pneumogastric and sympathetic may be cut without disaster. Injury to the facial nerve, followed by paralysis, is an unfortunate occurrence which may arise during the removal of glands in the neighborhood of the parotid. The inferior maxillary branch supplying the lower lip and adjacent parts may be cut while working in the submaxillary region, although this will not occur unless the bone is encroached on too closely. An unpleasant distortion of the corner of the mouth results, especially in talking. This may correct itself, as claimed by Dowd. If it does not, it has been suggested that the deformity can be mitigated by dividing the nerve of the opposite side. This is accomplished by slipping a tenotome from below under the tissues covering the jaw anterior to the facial artery, and severing the nerve against the bone.

Adhesions of glands to nerves and vessels may often be suspected because of various pressure symptoms, such as pain and numbness in the arm, engorgement of facial veins, weakness of the temporal pulse, etc.

When removing glands in the lower portion of the neck it is possible to injure the pleura, and, on the left side, the thoracic duct. Injury to the duct may not be noticed at the time, but manifest itself later by an

abundant flow of lymph. It is best managed by packing and often recovers.

It is wise to avoid division of skin nerves, but this is not often possible, so that anesthetic areas about the ear, for instance, frequently follow an operation. They tend to disappear in time.

Riedel's claim that the removal of too many glands from a given region may result in more or less permanent edema is scarcely tenable, as the connective tissue lymph spaces soon form an adequate collateral circulation (Bayer).

Drainage to prevent the accumulation of blood and serum is desirable, although it may be dispensed with in twenty-four hours. Dressings should exert as much pressure as is tolerable, by means of properly placed pads of gauze and a well-adjusted bandage. Plaster-of-paris casts or supporting sandbags are unnecessary. The lavage of large cervical wounds with strong antiseptics is not advisable because of the occasional powerful action on important nerve structures.

Especial care must be given to anesthesia, as there is once in a while a marked tendency to stoppage of respiration, although I have failed to notice this to the extent emphasized by Finkelstein.

The necks of those who have suffered from tubercular glands are apt to be disfigured by unsightly scars, which may be corrected by excision, skin grafting or filling depressions with paraffin. There is an unfortunate tendency, especially in tubercular lymphadenitis, for scars to become red and hypertrophied—a sort of false keloid. Sometimes this is unavoidable; but again it appears to be due to irritation of the immature cicatrix, and may be prevented by adequate protection of the part. Removal of such scars may be followed by recurrence.

STATISTICS OF OPERATIVE TREATMENT.

The exact percentage of complete cures following radical operations is difficult to obtain, for most cases soon disappear from observation. The available figures vary markedly. Wohlgemuth, for instance, reports 70 per cent., Hobel 68 per cent., and Von Noorden 62.4 per cent.—an average of 65 per cent. in 309 cases. Blos, on the other hand, places the number of cures at 46 to 48 per cent., while Billroth obtained but 24 per cent.

The mortality, when the operations are skilfully done, is surprisingly low, most of the fatalities, as in goiter, being due to pulmonary complications. Too much should not be attempted at one time, and it is often better to operate in two sittings rather than attack both sides of the neck at once.

My own cases, although considerable in number, are neither numerous enough, nor have they been sufficiently well followed up, to permit of the drawing of reliable conclusions. My belief is decided, however, that radical operation is not only justifiable, but strongly indicated, in all serious or obstinate cases. And it must not be forgotten that better results can be obtained in Colorado than in lower, less favorable localities, because the chances of relapse are not so great.

SUMMARY.

1. The gravity of tuberculosis of the cervical lymphatics, both as regards local deformity and remote secondary manifestations, is generally underestimated.

2. General treatment, especially hygiene, is of the utmost importance, both in the cure of incipient trouble and in the prevention of relapses following operations on more advanced cases, most recurrences being due to neglect of such measures.

3. Residence at the seashore has long been recognized as of great benefit; but there is reason to believe that a high and dry climate, such as that of Colorado, with its rarefied, stimulating atmosphere and abundant sunshine, possesses superior advantages.

4. A point of extreme importance in local treatment is to abolish sources of infection, in the teeth, tonsils, nose, ear, scalp, etc., and neglect of this is apt to result in failure.

5. Non-operative treatment is often of doubtful utility, except in the beginning of the disease.

6. Pulmonary involvement does not contra-indicate operation, at least in Colorado, except in advanced cases.

7. Curettement is applicable to sinuses, tubercular ulcers of the skin, and where complete removal would be attended by too much risk. In all other instances a thorough operation should be done.

8. The size and shape of the incision should be adapted to the particular case. It should be free enough to permit of thoroughness and safety.

9. The chance of permanent cure following operation is probably better in Colorado than in lower and less favorable altitudes.

SANATORIUM TREATMENT OF TUBERCULOSIS.

ANALYSIS OF THREE HUNDRED CASES TREATED AT THE UNITED STATES MARINE-HOSPITAL SERVICE SANATORIUM.*

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SURGEON U. S. M.-H. S.

FORT STANTON, N. M.

My object in this paper will be to show briefly the results obtained in three hundred and three cases of pulmonary tuberculosis treated at Fort Stanton during a period of about two and one-half years by the open-air climatic treatment. In computing the value of these statistics the chronic nature of tuberculosis of the lungs and the comparatively short duration of treatment must be considered; the average length of treatment in the fatal and discharged cases having been something less than six months, including cases in every stage of the disease; in some the history only covered a period of two or three months and in others the disease had existed for years.

In one hundred and forty-two, or nearly 50 per cent., the history of the disease extended over a period of one year or more prior to admission. In a few cases the physical signs indicated lesions slight in extent, and there was little aside from the presence of bacilli in the sputum on which to base a diagnosis, but unfortunately the moderately and far-advanced cases outnumbered the early cases nearly five to one; some were so far advanced as to excite wonder that they were able to survive the journey to the sanatorium, and in one case death occurred at the railway station before the unfortunate patient could be transferred to the sanatorium; the statistics, however, are given you as they stand and, notwithstanding the great predominance of far-advanced cases, it is believed that the results attained will offer some encouragement to those interested in the climatic treatment of tuberculosis of the lungs.

LOCATION, CLIMATE, ETC.

Fort Stanton is located in Lincoln County, New Mex-

* Read at the Fifty-third Annual Meeting of the American Medical Association, in the Section on Hygiene and Sanitary Science, and approved for publication by the Executive Committee: Drs. Arthur R. Reynolds, George Cook and Heman Spalding.