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THE RESULTS OBTAINED FROM THE RADICAL OPERATION FOR CHRONIC PURULENT OTITIS MEDIA.*

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Owing to the frequency of chronic middle ear suppuration, and the fatal results which so often follow this condition, if it is left uncontrolled, it is no wonder that the radical operation for the cure of chronic middle ear suppuration has been greatly exploited during the past decade. The true value of any surgical procedure can only be determined after the operation in question has been in vogue for a number of years, thus giving an opportunity for the ultimate results following operative interference to be definitely decided upon.

The results obtained by the operation in question, may be considered under the following heads: 1st, the efficiency of the operation in protecting the patient against intra-cranial suppuration; 2nd, efficiency of the operation in causing a permanent cessation of the otorrhea; 3rd, the immediate and remote effect of the operation upon the function of the organ, and 4th, the effect upon the integrity of the facial nerve.

I have upon my books at the present time records of 193 operations of this character. In none of these patients, so far as I know, has there been any evidence of an intra-cranial lesion after the suppuration has been relieved. We may say, therefore, that the radical operation certainly does protect the patient from the dangerous

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sequelae of middle ear suppuration. When we come to consider the matter of the permanent relief of the otorrhea, the results obtained by this procedure are, perhaps, not as flattering as we had hoped they would be when the procedure was first suggested.

Out of 193 cases, there are 131 cures, 29 with slight discharge, 5 with profuse discharge, 2 still under treatment, 6 fatal cases, and 20 cases in which the result is unknown. In going over these results more in detail, if we take out the 20 cases, in which the result is unknown, we have 173 cases, of which 131 are cured, or a little over 75%. Out of the last series of 95 cases, the cures amount to exactly 80%, in those cases in which the results are complete. In the last series of cases, in no instance did the discharge remain profuse after the operation, all of the cases being either dry or presenting but a slight discharge from the meatus. Of the 6 deaths, two patients died of pneumonia, two of meningitis, one of cerebral abscess and one of cerebellar abscess, complicated by sarcoma of the auditory nerve. In no instance, could death be attributed either directly or indirectly to the operation.

Of those cases which were operated upon several years ago, and which have been followed carefully, the results have been most satisfactory. Even where a small amount of discharge has persisted for weeks or even months after the operation, this discharge has in almost every instance, disappeared absolutely, without the necessity of secondary interference, under simple measures of cleanliness.

Even in those cases where the cure has been considered perfect, it is not uncommon to have the patients return, at intervals of from three to four months to one or two years, complaining of some discharge from the external auditory canal. An examination will show the entire cavity filled with a mass of desquamated epithelium, upon the removal of which a small amount of pus may be found. If this accumulation has remained in the canal for a considerable period of time, desquamation of the epithelial lining of the cavity may have taken place, either completely or over certain areas. On removing the epithelial mass, the cavity certainly looks far from healthy, and one unaccustomed to this condition, would certainly say that the radical operation had been a failure. If the cavity is simply sterilized with an alcoholic solution of bichloride of mercury, and then dusted with some bland non-irritating powder, such as boric acid, xeroform, zinc oxide, or, in fact, any sterile powder, the cavity immediately becomes dry. In other words, the apparent relapse in so many cases is due simply to the fact that the integument lining the middle

ear cavity and the mastoid cells, is improperly nourished. This integument forms the lining of a blind pouch where it is subjected to increased temperature, increased moisture, the absence of light, and no circulation of air, these latter conditions being essential to the proper nutrition of the normal skin. Moreover, it must be remembered that this tegumentary lining is applied closely to the bony walls of the cavity, with very little connective tissue substance intervening. It is not strange, therefore, that desquamation should take place from time to time in such a cavity, and that the desquamated epithelium, if allowed to remain in position, should gradually accumulate until the cavity becomes completely filled with these epithelial cells. The pressure of these cast-off cells causes superficial ulceration of the underlying tissue, so that complete desquamation of a cavity of this kind frequently takes place. These attacks of desquamation of the cavity occur less and less frequently as time goes on, because the integument gradually adapts itself to its new habitat, and in the course of time is able to conform itself to its anomalous position. These attacks of desquamation should not be looked upon as a recurrence of the otitis. As before stated, they are easily relieved by the removal of the epithelial detritus, and the sterilization of the walls of the cavity.

When the radical operation was first proposed, and, I am sorry to say, even at the present time, many surgeons have hesitated to advise the procedure for fear of impairing the function of audition, as the result of operative interference. In the series of cases in which I have advised this operation, I can state that in but very few instances has the hearing been made worse by this procedure.

Out of 111 cases, in which the hearing records were kept, the hearing after the operation was good in 99, was fair in 9, and was bad in 3. By "good hearing," I mean hearing where the whispered voice was heard anywhere from 5 feet to 15 feet, and by "fair hearing," where the whispered voice was heard from 3 feet to 4 feet or 6 feet. In the 3 remaining cases, where the hearing is recorded as "bad," the hearing was worse than before the operation.

If the operator exercises caution in his manipulations, and is careful neither to dislodge the stapes, nor to impact it in the oval window, he can promise the patient almost certainly that the hearing will not be greatly interfered with, as the result of the operation. This remark applies to those cases in which the hearing is considerably impaired before the procedure is undertaken. Given, for instance, a case of chronic middle ear suppuration, where the low whisper is heard at a distance of 10 feet, in such a case, impairment of the

hearing might follow operation. With a whispering distance of 3 or 4 feet, however, the hearing would hardly become impaired as the result of the operation, while the chances of improvement in the hearing would be considerable.

I have a number of cases at the present time under observation which were subjected to the operation a number of years ago. In these cases, the hearing has steadily improved, owing probably to a gradual mobilization of the stapes by sound waves. In those cases, therefore, where no labyrinthine lesion exists, as evidenced by careful functional examination, and where there is a moderate impairment of hearing prior to operation, the surgeon need not hesitate to advise the procedure for fear of impairing the function of the organ. The hearing is more apt to be improved by the operation than to be impaired by it.

Referring to those unfortunate cases where a partial or a complete facial paralysis results from the operation, either immediately, or where it supervenes at the end of a few days, I can only say that in my own experience, the function of the facial nerve has ultimately been restored in every instance. Out of the last 95 cases operated upon, facial paralysis occurred in 4 instances, and in every instance, the function of the facial has been restored.

Of the series of cases previously reported, the exact number of instances in which the facial was involved is not definitely known. (*Transactions of the Seventh International Otological Congress*. Bordeaux, 1904.) I should say, however, that secondary paralysis occurred in about the same proportion of cases in these two series. In those cases where facial paralysis comes on at the end of two or three days after the operation, the function of the facial nerve is usually restored at the end of two or three weeks, although I have seen several months elapse before power was completely restored to the facial muscles. In those cases, where facial paralysis comes on immediately after the operation, the period before complete recovery takes place, is often long. Here, six, seven, eight, or even more months may elapse before all evidences of facial paralysis disappear. If, however, the facial nerve is not completely severed at the time of operation, I believe that its function will be entirely restored in the very large proportion of instances. Where facial paralysis does occur, it is best treated by daily applications of either the galvanic or faradic current, the galvanic being used where the muscles do not react to faradic stimulation. Where the muscles react to faradism, the faradic current is used. In addition to the

use of electricity, the administration of strychnine internally, seems to hasten the restoration of the function of the nerve.

You will understand that I am speaking now simply from my own statistics, and in no single instance have I seen, in my own cases, permanent facial paralysis follow the operation.

So much for the ultimate results obtained in these cases.

Certain questions have come up in regard to the technique of the operation, which may perhaps be discussed here. *First*, the advisability of primary grafting. *Second*, the advisability of secondary grafting at the end of five to ten days after the primary operation. *Third*, the advisability of the introduction of grafts through the canal. *Fourth*, anomalous methods of healing after skin grafting.

There is no doubt in my own mind as to the advisability of employing large skin grafts for lining the bony cavity formed during the radical operation. It is true that all of these cases will recover, and will recover quite as well if skin grafting is not employed. From a considerable experience, however, I am absolutely certain that the period of convalescence is shortened if skin grafting is employed, either as a primary procedure or from five to ten days after the original operation.

Out of the last 95 cases, primary grafting was employed forty-eight times. The grafts did not take in every instance, but in at least 75% of the cases, the grafts adhered either in part or throughout. The application of either primary grafts or of secondary grafts certainly shortens the convalescence.

Regarding the advisability of applying grafts through the external auditory meatus, this procedure has been advocated by a number of writers. I have employed this method in but one instance. Here the result was satisfactory, but here also, the external auditory meatus had been very greatly enlarged by means of a plastic operation. I do not think that the application of Thiersch grafts through the external auditory canal is applicable to a very large proportion of cases, and I prefer therefore, to apply the grafts either at the time of the first operation, or to do a secondary operation for the purpose of grafting the wound through the posterior opening.

As to whether the skin graft is to be inserted at the time of the primary operation, or at a later date, this will depend somewhat upon the choice of the operator, and very largely upon the pathological conditions found at the time of the operation. If the case operated upon is what may be termed an "interval" case, that is, if there are no symptoms of acute suppuration, if there is but little

fluid pus in the mastoid antrum and mastoid cells, and if neither the dura or sinus is exposed at the time of the operation, I believe that primary grafting should be the rule. The fact that either the sinus or dura in the middle cranial fossa is exposed at the time of the primary operation, does not necessarily prevent the operator from lining the interior of the cavity with a skin graft, provided the sinus and dura seem normal. Care should be taken, however, that the grafts be applied only to those parts of the middle ear not in the immediate vicinity of the exposed sinus or dura. Where the sinus has been exposed, it is my invariable rule not to close the posterior wound completely, but to insert a small gauze drain over the sinus and bring it out at the inferior angle of the wound. This gauze drain is removed at the first dressing, and may or may not be replaced, according to the condition found. In cases which are particularly foul, that is, where the mastoid cells are found to contain fluid pus, or where the necrosis is extensive, I seldom employ primary grafts. In these cases the posterior wound is not sutured. The plastic operation on the auricle is done, the posterior wound packed and the case dressed first on the third or fourth day. After this time, it is dressed daily until healthy granulations are found, lining the entire radical cavity. Any time from five to ten days will be a favorable time for grafting upon these granulations. Of course, after the secondary grafting, the posterior wound is completely sutured.

There is one method of healing which has been observed in a number of cases that have been grafted primarily. In certain instances it is unwise to apply the grafts over the entire bony cavity, owing either to exposure of the sinus over a limited area or exposure of the dura. In cases where the cavity is partially grafted, and the remainder allowed to heal by granulation, the grafts may become incarcerated in the granulation tissue; that is, if the graft is applied to the fundus of the bony cavity and not to the walls, granulations may spring up from the walls, and for a time almost completely hide the grafted area. As these granulations are controlled, however, the fundus of the canal will gradually appear, and the graft will be found in place and adherent, and the fundus dry.

Another condition which is sometimes met with, is an adhesion between the upper wall of the operation cavity and the facial spur. In cases where the middle cranial fossa lies very low, it is sometimes impossible to prevent this adhesion from forming. On examining the ear we find the radical cavity divided into two parts by a septum or partition, a posterior portion, made up of the mastoid cavity, and

an anterior portion comprising the atrium and vault. In some instances, this septum may extend nearly to the meatal opening. We seldom find the ear perfectly dry while this septum is present. If simple cleanliness is observed, however, the septum gradually disappears, and after an interval of from three to nine months after the operation, the entire radical cavity will be found to have resumed its proper form. In one instance, I remember that this septum so obstructed drainage, that it was thought a secondary operation might be necessary. Simple division of the septum and packing the wound with gauze, brought about a complete and permanent cure.

I have attempted to present the results following operation as clearly and concisely as possible. The paper simply embraces a study of my own cases, and does not deal at all with the experience of others.

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A Remarkable Case of Diphtheria. MASAGER. *Rev. Hebd. de Laryngol. etc.* April 8, 1905.

Dr. Masager was called to a nine-year-old boy suffering from diphtheria. He found him cyanotic to such a degree that he already appeared asphyxiated. He practiced immediate tracheotomy with a pocket knife and inserted a rubber drain for a canula. A large piece of bronchial exudate of a diphtheritic nature was expelled. In spite of a pneumonia which developed afterwards, the child recovered.

SCHEPPEGRELL.