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President: J. P. MONKHOUSE, F.R.C.S.

Discussion on Problems of Tympanoplasty

February 3rd, 1961

The opening papers will be found on pp. 879-908.

H. ZALIN: The use of free skin grafts derived from the external auditory meatus as described by Dr. Plester involves a denudation of the bony wall of the meatus. Theoretically this should involve slow healing by granulations and present a considerable change of stenosis. I would ask Dr. Plester whether in fact this does occur, and if not, why not?

The surgery of the suppurating middle ear and mastoid is our main problem and I am interested in Dr. Plester's approach to this. In particular his description of an indwelling drainage tube introduced through an antrostomy opening through which infected secretions accumulating in the middle ear are aspirated, thus protecting the skin grafts from tension. Assuming that this is possible, and the maintenance of a patent tube over a considerable period in the depths of the antrum presents practical difficulties which may be insuperable. I do not see how the basic objection of the operation is resolved. The suppurating process within the middle ear cannot be expected to subside merely because we have covered it over by skin. We must beware of being mesmerized by our skill in introducing skin into the ear at the expense of basic principles.

Mr. Thorburn is to be congratulated on his exposition of Rambo's temporal muscle graft technique. In this context I would point out that Rambo's work represents a revulsion from the Wullstein conception of tympanoplasty and substitutes a standard technique for eradication of injection and restoration of hearing by fenestration.

I would suggest that the multiple procedures, with their offshoots and modifications, which are now being published at regular intervals, indicate dissatisfaction with the results of Wullstein tympanoplasty and that this dissatisfaction may increase further with time.

MR. FRANCIS MCGUCKIN: The chief reason for today's discussion is surely that, having looked at eight or nine years of tympanoplasty, we find it necessary to modify our thinking about reconstructive tympanic surgery. It is known to some among this present audience that I have come to dislike the use of extra-meatal free-skin, except possibly in the region of the mesotympanum. Even here there may be other ways of getting round the problem, but I must confess

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to a limited experience of operating on lesions which are not active. Mr. Beales is right to insist on the most meticulous standards of temporal bone surgery—we have no disagreement here. I am less sure about what is meant by the basic principles of plastic surgery. These are not absolutes and are just as subject to modifications demanded by experience as the original principles of tympanoplasty. Whatever the rules of plastic surgery may say, we must recognize that the skin of the deep canal is unique, being for the most part at once skin and periosteum and not epidermis and dermis, something designed for its own habitat, with its own physiology, its own very slow reproductive capacity and its own temperature environment. I agree that in clean cases with limited damage, extrameatal free skin, which is physiologically alien, may be successful when applied to an area having a first-class nutrition, for example the mesotympanum. Yet I would suggest that the physical and functional results are far better when this free skin is thrown out in the washing after acting as a scaffold for regeneration of mucosa, since in this event the patient is left with the same kind of result as nature produces in cases of spontaneous arrest of disease. Moreover, the successful repair of defects depends upon the mucosal element of membrane, a thing of paramount importance.

It seems to me, Mr. President, that Dr. Plester in his advocacy of the use of meatal skin, Mr. Thorburn in his ingenious application of Rambo's principle, and Mr. Beales in his very restricted use of free skin and also in his much wider use of post-aural pedicle flaps, are all three saying that the original ideas we accepted so readily are in need of modification. At the present time I know of seven different techniques designed to avoid the use of extrameatal free skin, in centres which are as widely spread as Western California and Dusseldorf. Currently I am trying to depend on natural regeneration supplemented by nylon sheets. However, it is only by the free exchange of experience and ideas such as those so ably presented this morning that we can hope to make advances.

Finally, Sir, I would make two points:—

(1) Reconstruction is theoretically easy where there is no activity, whereas it is always more difficult, sometimes impossible and occasionally disastrous, when disease is active.

(2) In my view we are guilty of a sin of omission because we have all given far too much attention to repair after destruction, and far too little to the microscopic observation of the processes leading to that destruction. This is quite another matter, almost a private hobbyhorse, and it would be improper to give the animal another trial-run on this occasion, even though I believe that the predominant cause of destructive ear disease lies in an instability of deep meatal skin.

Mr. I. Simson Hall: It has been a great pleasure to have had such excellent papers on this subject, and the results outlined by Dr. Plester are very valuable. I have been using this method of the external meatal skin for grafting for some little time and I can confirm all that he says about it.

Dr. Thorburn's contribution to the discussion is most timely, for I believe that the next real advance in this type of work will be the elimination of the mastoid cavity which we have been accustomed to regard as essential in any of

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the larger mastoid operations. Experiment along the lines he has outlined is indicated and may prove fruitful.

I have had considerable experience of temporal muscle flaps for filling the cavity, but I gave up the method as it did not give as good results as other methods which I had at that time in use. It is possible that the fact that there were no antibiotics available when I carried out these observations may have explained my lack of success. I have recently been using a method of pedicle graft from below, and at present am filling the mastoid cavity with muscle, periosteum, and other tissues which are taken from behind the ear, with the pedicle over the origin of the sternomastoid. This seems to me to fill the cavity better than the flap coming from above, and it can also be covered with a skin graft to expedite healing. I believe that in a few years' time it will be as unusual to see a large cavity in the ear as it is to see a hole behind the mastoid following the Schwartze operation such as we saw 20 years ago.

WING CDR. P. F. KING: I congratulate the opening speakers on their interesting papers.

I wish to report a series of 135 ears in which myringoplasty was carried out by me. The series extends over four years; longest follow-up of 4 years and the shortest 6 months. For this discussion, successes are considered such only when the tympanic membrane is completely healed.

Results. Completely healed 94 (70 per cent.), failures 41 (30 per cent.). My results show a rising rate of success with the passage of time and the acquisition of practice. The results broadly compare with those of Mr. Mawson. A further point of interest is that in the first 2 years a "patch" operation of the sort described by Mr. Mawson was carried out, whereas in the second 2 years I was carrying out an operation which Mr. Thorburn would call an extended myringoplasty.

Some points of technique which might be of interest.

(*a*) Complete stripping of surface skin of tympanic membrane and excision of the deep meatal cuff of skin, using modified Zöllner suckers for dissection.

(*b*) Full thickness free skin graft, rather larger than a halfpenny, cut from the arm.

(*c*) Gelatine sponge soaked in antibiotic and Cortisone solution used as support in the middle ear.

(*d*) Green wool, soaked in Neocortef ointment, is used for packing the graft. The colour contrast facilitates the careful packing of the graft in its correct position and makes for easy removal of dressing.

Otitis Media. Otitis media occurring up to one year after operation was the primary cause of failure in 13 cases. Otitis media occurred in a further six cases, which healed well despite it or because of it. Three ears also had eczematous otitis externa after the operation but came to no harm.

Desquamation. I have only seen desquamation in those cases where fluid was macerating the superficial layer of the graft. In a normal case, I aim to remove a dry crust of surface epithelium from the graft at 2 months, finding underneath a well-healed tympanic membrane. A desquamating graft following myringoplasty generally indicates a leak of fluid from the middle ear.

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GAVIN LIVINGSTONE: There should be more uniformity in reporting results of Tympanoplasties.

These are the three methods used to record the improvement in hearing. Firstly, reporting the reduction in the air bone gap; secondly, average improvement in decibels over 500, 1000, 1500 band, and thirdly, the percentage preservation or restoration of social hearing which has taken place. Social hearing is taken as a 30 db. level American standard, and I favour this latter method.

There are more techniques available to the otologist today than in other times. Fenestration is now often indicated in Tympanosclerosis. The uses of polythene tubing and interposition surgery is opening a vast field, although still unproven, and newer uses are being made of vein grafts.

With these newer methods and the probability that pedicle muscle grafts will solve the problem of the mastoid cavity, has the time come when healthy but useless tissue may be sacrificed in the middle ear in order to produce a standardized anatomical picture on which to reconstruct a functioning ear?

STUART R. MAWSON said he was now in a position to give the results of five years' work involving 62 operations of Myringoplasty. He had based the selection of cases on the assumption that the "safe" ear was a clinical reality and he had not carried out preliminary exploration of the antrum, attic, or stapes region prior to operation in any case, having selected them on the clinical criteria of a "safe" perforation that had been dry for 2 months. The standard of success as far as the hearing was concerned had been closure of the air-bone gap. The most success that could be gained in any case was 100 per cent. closure of the perforation and the air-bone gap and this had been achieved in only six cases. In two other cases there had been 100 per cent. closure of the air-bone gap without 100 per cent. closure of the perforation. In 10 there had been 50-99 per cent. closure of the air-bone gap with 100 per cent. closure of the perforation and in 16 there had been 5 to 49 per cent. closure of the air-bone gap with 100 per cent. closure of the perforation. In seven cases there had been 100 per cent. closure of the perforation but no closure of the air-bone gap and in two cases 100 per cent. closure of the perforation with widening of the air-bone gap. Out of 62 cases, however, 19 could be classified as unqualified failures of which six had had no closure of the perforation and the gap was wider. From study of these results he agreed with the previous speaker (Mr. Beales), that Myringoplasty was worthwhile provided very careful selection of the cases was undertaken. He felt that the absence of any serious complication vindicated the concept of the "safe" ear but that simple Myringoplasty might result in worsening of hearing if it was undertaken in cases in which it had not previously been established that the ossicular chain was intact and the Eustachian tube functioning.

W. STIRK ADAMS said he had used the sliding pedicle graft for obliteration of the cortical mastoid cavity in a series of 10 to 15 cases, some 20 years ago, a procedure originally suggested by Jenkins to avoid an epitympanomastoid operation in cases of relapsing otitis media with posterior marginal perforations in the drum head, with the object of preventing re-infection of the middle ear from the mastoid.

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In its primary aim it had proved reasonably effective, and there were few recurrences of middle-ear infection, though there was seldom any significant improvement in the patient's hearing over the pre-operative level. There was, however, a serious and unforeseen disadvantage as these were never comfortable mastoids, and over the succeeding years practically all cases have required a revision operation with removal of the graft and the completion of an epitympanomastoid procedure.

In this technique the original operation was a full cortical exenteration, and the pedicle graft was then turned in to fill the cavity and occlude the posterior entrance to the aditus. In some cases it was taken from the temporal muscle with an anterior pedicle, in others from the upper sternomastoid, but in the majority a fibroperiosteal strap was elevated from under the posterior skin of the post-aural wound, with an inferior attachment, as this could be carried out without extending the original incision and avoided interference with muscular function.

The post-operative symptoms which ultimately made the revision necessary were in some cases a continuous local discomfort, others had a sense of dull pressure on the side of the head, with a general irritability, or a sense of irritation in the mastoid and temporal areas with dizziness at times, and others had attacks of unsteadiness and in some cases continuing vertigo.

After the development of distress symptoms the decision on the timing of the revision operation was left to the patient, and this was performed sometimes months, and often years later.

At the second operation there was no evidence of local infection in the mastoid, and after operation symptoms disappeared. When they were first encountered it was felt that the local symptoms might be the result of a tissue reaction in an over-sensitive patient, but in all other respects these were stable individuals, and as successive cases presenting symptoms of similar type occurred one recognized the syndrome and abandoned the operation.

These results seemed to indicate that in obliterating the mastoid and posterior aditus some physiological function of the mastoid alveolar system had been disturbed, and further reflection initiated the suggestion that this was likely to be an interference with a respiratory function of the lining membrane of the mastoid alveoli. Later the author's concept that this was a gas secretion by this epithelium was developed as an explanation of the presence of the residual air in the middle-ear cleft in cases of tubotympanic dysfunction, to which our President referred in his recent Presidential Address.

MR. MAXWELL ELLIS said Mr. Stirk Adams certainly surprises me when he says that he has often had trouble with temporal muscle grafts, and the symptoms he describes astonish me. My own experience is similar to that of Mr. Thorburn. Since I was first shown the technique of temporal muscle grafting by Mr. Kisch, over 20 years ago, I have employed the method with considerable success and in several different types of case. Mr. Kisch used the graft to fill the antrum and attic after a modified radical mastoid operation, but I have found it more useful in reducing the size of large radical mastoid cavities and large fenestration cavities, as a preliminary to a skin graft. In the days when one saw post-auricular fistulae I have employed a temporal muscle graft to fill the

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post-aural cavity, forming a nutrient bed over which to draw the skin flaps. I have not employed it in the same way to fill the tympanic cavity, but there seems no reason why it should not be equally successful in this situation.

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