After-treatment

Whether in the after-treatment of the case the medical attendant favours the so-called dry method of mopping out, or the method of frequent washing out by syringing, irrigations must be employed if the discharge becomes tenacious, and even when discharge is free occasional relapse and disappointment can be overcome by a thorough but gently performed wash-out with a mild isotonic saline or alkaline lotion. Kerrison¹¹ strongly advocates washing out almost immediately after paracentesis, to avoid gumming up of the incision by blood clot or fibrin. In the later stage, too, irrigations with a mild mercurial lotion and the use of the suction speculum may result in resolution and avoid further operation as the time approaches to suggest drainage through the mastoid, namely, in three to six weeks.

Differential Diagnosis from Other Causes of Acute Earache

Acute pain felt in the ear may be caused by troubles at a distance, or by local troubles, not middle-ear inflammation:

Referred pain from a tuberculous laryngitis, malignant growths of the posterior parts and side of the tongue, malignant disease of the pyriform fossa—these are well known. More simple causes may be a carious molar tooth, and a partly erupted or impacted wisdom tooth must not be forgotten. Sharp pain in the ear is noted in acute tonsillitis, particularly when peritonsillar inflammation is added, but, of course, an actual middle-ear inflammation may follow as well. A tonsillolith may prove a hidden cause. Accessory sinus disease has also been blamed for pain referred to the ear, and in conclusion one does see a few cases, chiefly in young women, where no cause whatever can be discovered on examination.

There is, of course, the occasional case of mumps when middle-ear trouble or mastoiditis has been wrongly suspected. A dental abscess has been seen to discharge from the external meatus. But undoubtedly the commonest cause of pain, sometimes difficult to dissociate from a middle-ear attack, is infection in the skin of the meatus. I refer to furunculosis and to the dermatitis which we conveniently call eczematous, and occasionally the diagnosis presents very considerable difficulty. Undoubtedly the pain in such cases is often referred to the front of the ear, or below it, and when infection reaches the mastoid lymphatic gland a true mastoiditis may be wrongly suspected. The unpleasant condition of pediculi capitis has been responsible for an error of this kind.

Sometimes when cerumen becomes impacted in the deep meatus, but particularly in that stubborn form of impaction called keratosis obturans, very great pain may arise deep in the ear (not to forget collections medial to exostoses of the canal), and it may be exceedingly difficult to decide whether the inflammation of the drumhead has been set up by such mechanical conditions, or whether an acute otitis media lies beneath. The difficulty sometimes experienced in clearing the meatus for diagnosis, and the very great pain involved in any such manoeuvre, provide a situation extremely trying for both patient and doctor.

Foreign bodies, whether introduced from without or human material becoming foreign, as described above, may cause inflammation of the drumhead, or, to give a descriptive name, myringitis. Primary myringitis must be an uncommon disease, and such conditions as interlamellary abscesses described by Politzer would be considered by Ruttin⁹ as extensions from middle-ear infection and situated in a small space which he has described within the structure of the tympanic membrane—a miniature bursa of the handle of the malleus.

Herpes zoster oticus, a rare condition, provides another possible cause of ear pain, and perhaps it is but the severe manifestation of a syndrome which may exhibit polyneuritis meatus auditorii interni, or even so-called banal facial paresis alone.¹⁰

In conclusion, primary otitic erysipelas should be mentioned. In women the close-fitting hat may be the predisposing cause. The external meatus, the auricle and periauricular area may all be involved. In this disease, when a large blood-clot-filled bulla of the deep meatus obscures the drumhead, one might be tempted to diagnose an acute middle-ear attack as the origin. To open the deeply situated bulla would be permissible, but the result of an incision of the drumhead under such conditions might be far too unpleasant to contemplate.

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SUB-ACUTE OTITIS MEDIA *

BY

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Inflammation in the middle-ear is always secondary to infection of the nasopharynx, and like the latter is always sub-acute in its beginning. It is the obstruction of the Eustachian tube which enhances the acuity of the inflammation and leads to the production of acute otitis media.

In acute otitis media, the immediate problem which confronts the surgeon is the potential danger to the patient's life. The occurrence of intracranial complications is circumvented by a myringotomy when the inflammation has not spread beyond the confines of the middle-ear, or by a mastoid operation when the well-known signs of mastoiditis are exhibited. After the drainage of the pus has been established the case becomes one of sub-acute otitis media, and the main problem is the conservation of the patient's hearing.

Sub-acute otitis media differs from the acute variety in the fact that the Eustachian tube is partially patent and that the pus drains down it. The acuity of the inflammation is generally in proportion to the degree of obstruction of the tube.

SUB-ACUTE OTITIS MEDIA IN CHILDREN

This is characterized by recurrent attacks of evanescent pain in which there may be slight discomfort when the child presses his mastoid against the surgeon's thumb and by a transient bulging of the membrane coincident with periods of pain. The alteration in the hearing is similar to that found in acute otitis media after a myringotomy or spontaneous perforation, and is believed to be due to oedema of the mucous membrane covering the round and oval windows. If the diminution of the hearing power is maintained after the period of pain

* Read in opening a discussion in the Section of Oto-Rhino-Laryngology at the Annual Meeting of the British Medical Association, Eastbourne, 1931.

has passed or when the drumhead is no longer out-placed, it is a sign of bad prognosis. A graph of the most usual form of alteration of the hearing is shown in Fig. 1. In this the hearing of the middle tones is nearly normal and there is diminution of the acuity of hearing of the lowest and the highest notes.

Cases fall into the following main groups:

1. Those in which the micro-organisms and leucocytes disappear within an hour and a half. In the majority of these the infection of the middle-ear clears up spontaneously when the parent source of sepsis in the nose or nasopharynx has been remedied.
2. Those in which the leucocytes and micro-organisms disappear within three hours. The majority of these get well on removal of the parent source of sepsis and on repeated aspiration of the tube.
3. Those in which the leucocytes disappear but in which the micro-organisms remain within the fluid. In some cases these micro-organisms can be cultivated and in others they are dead. Failure of disappearance of the micro-organisms is a point of bad prognosis. This last group must not be confused with the effects of dilution of the mucus with saline. If mucus from a case in the first group, in which the micro-organisms disappear spontaneously in ninety minutes, is dissolved in saline, the leucocytes will disappear, but their bactericidal ferments are too dilute to kill the micro-organisms which may occasionally flourish in this diluted medium which before dilution was efficiently bactericidal.

The microscopy of these fluids cannot form part of our routine examination of these cases, but if occasionally practised it probably enables us to recognize and treat these cases with increased efficiency.

Treatment.—The infection of the Eustachian tube and middle-ear is never primary but always secondary to some area of infection in the nose or nasopharynx. This area must be found, and if the infection is within a sinus this must be washed out under cocaine anaesthesia, either alone or combined with nitrous oxide. The material for lavage may well be liquid paraffin, as this does not dilute bactericidal substances. These washings will be repeated once a week until either the sinus contents are no longer purulent or until the failure to resolve with washings once a week indicates the need of surgical drainage of the sinus. At the same visit, when the sinus is washed out, the Eustachian tube is aspirated with a tympanic catheter. The progress of the hearing must be watched with special care and indicated on the graph or quantitative record of the hearing. In cases which are not progressing favourably, and in which the infected mucus cannot escape from the middle-ear as quickly as it is secreted, a myringotomy will have to be performed. The normal, and, in fact, the only, natural means of emptying the middle-ear is by the action of the ciliated epithelium which is chiefly active in the Eustachian tube. If the ciliated epithelium has been destroyed, the Eustachian tube is generally patent, and the ear can be spontaneously inflated by Valsalva's method. If this is the case, a myringotomy may be performed, and the incision should be so planned that the middle-ear is emptied of its contents through the incision on inflation. The myringotomy will tend to close, but this may be in part prevented by the use of drops of liquid paraffin and by separating the lips of the wound each day by aspiration with a Siegle's speculum. It must be admitted that the greater the hypertrophy of the mucous membrane of the middle-ear, the greater is the tendency of the myringotomy to close. If the myringotomy wound closes and repeated aspiration fails to cure the case, the question of a mastoid operation with meatal drainage will be considered only in those cases in which the retention of the maximum degree of hearing is of real importance and the condition has not advanced beyond the point at which the subsequent contraction of the fibrous tissue in the tympanic mucous membrane will probably cause deafness.

ATROPHIC FORM OF SUB-ACUTE OTITIS MEDIA

The cases in this group appear generally to trace the onset of their deafness to an attack of influenza. Influenza

appears to be a generic term for all forms of acute nasal inflammation in which the infection is by micro-organisms which do not produce pus, that is to say, they do not call forth leucocytes by their chemical attraction. The type of micro-organisms which produce attacks of influenza appear to be those for which an antiserum can be elaborated in the circulating serum. The manufacture of this serum is accompanied by fever, and when the temperature falls it may be because the immunity is now established. The fall of fever may, however, indicate that the infection has been partly cured by some local application. If the micro-organisms are thus artificially destroyed within the nose, they still survive within the ear, and they are present in too small a quantity to produce immunity and bactericidal substances, and so they live and flourish in the tympanum.

If a study is made of each case of influenza which is accompanied by deafness, we find that after the attack the nasal mucus contains a quantity of desquamated epithelium. Similar desquamated cells are characteristic of the contents of the tympanic mucus in the atrophic type of sub-acute otitis media. In such cases the history differs little from that of the hypertrophic form of the condition.

The hearing in the early stages of this complaint shows the changes which are characteristic of the sub-acute otitis media of children. (See Fig. 1.) In the chronic cases, which are those we generally see, there is a steadily progressive deafness which finally becomes indistinguishable from that associated with otosclerosis. The graph of such a case is shown in Fig. 2.

FIG. 2.

On inspection, the tympanic membrane is more translucent than the normal, and, in fact, may nearly be transparent. The inner tympanic wall, denuded of its epithelium, shines red through the transparent drumhead. Sometimes the middle-ear is nearly dry, and in other cases it is filled with mucus in which bubbles may be clearly visible. This stage of the condition is as incurable as otosclerosis, which it resembles closely. Unlike otosclerosis, however, this condition was at one time eminently curable, but because in its period of curability it was symptomless, it attracted no attention. If after an attack of influenza the ear is inspected, as a part of the routine examination, with an electrically illuminated Siegle's speculum, in a few cases fluid with bubbles in it will be noticed in the middle-ear. Such patients should receive an aspiration of their Eustachian tubes, and their return to aural health should be supervised both by examination of the secretions of the nose or ear and by the record of the hearing in some graphic manner such as will display the rate of its return to normal. In watching such patients we discover that the majority

recover aural health spontaneously. It is the recognition of those who do not thus recover aural health which is important, for a proportion of them will drift on to deafness, which is as preventable in its early stages as it is irremediable in the stage in which we generally see it.

The conditions which tend to cause the maintenance of the state of inflammation should be kept in mind. I will not deal with them, for, except for the occasional occurrence of a sinusitis, or a tonsillitis, they are the province of the physicians, who tell us that anaemias, liver deficiencies, constipation, acidosis, and the presence of a toxic focus are the common causes of the failure of establishment of immunity from an infection.

THE USES AND MISUSES OF VACCINES*

BY

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With the introduction of vaccine therapy as a general therapeutic remedy by Wright and his school we witnessed what so often occurs when a good remedy has bad or indifferent advocates. Many of those who in the early days of vaccine therapy "used vaccines" had little or no knowledge of the remedy they proposed to use, nor did they attempt to study the principles of an antigen-forming antibody as exemplified by the injection of an antigen (or vaccine) into their patient. They merely administered the vaccine by rule of thumb at stated intervals, and hoped for the best. It never seemed to occur to those who thus misused vaccines that they were not even prepared to allow to a foreign protein (such as a vaccine undoubtedly is) the same vagaries as they would to a drug such as digitalis—namely, personal idiosyncrasies. It is therefore not to be wondered at that vaccine therapy, after a certain period of great popularity, fell under a cloud and was looked at askance. From being a "cure-all" it became a "no-good-at-all" in the eyes and teaching of many, and only of recent years has a more sane and reasonable view been adopted as to the place of vaccines in the therapeutic armamentarium. Even nowadays one has recently seen correspondence on such a subject as "Why do not pathologists adopt a standard initial dose?" Why does the *Pharmacopoeia* lay down the dose of iodides within the region of 5 to 20 grains according to the salt used; and have those practitioners who want a standard dose ever heard of iodism?

Generally speaking, vaccines can be used where time is not of great urgency, and where an active immunity lasting for some time can be aimed at. Antiserums, on the other hand, are remedies for urgency, and the production of passive, and usually very temporary, immunity only. Thus vaccine therapy is of the greatest use in prophylaxis, and it is probable that the public will never realize the debt it owes to T.A.B. prophylactic inoculation during the late war.

While it is obvious that for prophylactic inoculation stock vaccines must be used, I am strongly of opinion that where there is a chronic bacterial infection, the organism of which is known and can be obtained from the lesion, then an autogenous vaccine is the best. I have come across certain cases that have failed on an autogenous vaccine, and then have cleared up on a stock vaccine of that particular organism; but such cases are in my experience rare.

Detoxicated vaccines are in my opinion useless as specific remedies, and whatever good may be obtained

from their exhibition is merely the result of foreign protein shock. In fact, one has obtained as good results in certain gonococcal cases from giving detoxicated T.A.B. as from giving detoxicated gonococcal vaccines.

TYPE OF CASE SUITABLE FOR VACCINES

As regards the type of case suitable for vaccines, I think success is more likely with young people than with old, and the nearer one gets to the age of 50 the less likely one is to have success. After 50 I am always chary of advising a vaccine, and in my opinion the lack of success with colon bacilluria in elderly women is due to "anno Domini." Even in this type of case one sometimes seems to get remarkable results, for some women after the menopause seem to take a new lease of life, and once more I would emphasize the advisability of autogenous *coli* over stock vaccines.

In many types of infection I really think the pathologist or bacteriologist should see the case it is proposed to treat. It may be argued that this involves an additional fee and expense, and that a bacteriologist is no clinician. While these things may be true in theory, in practice a bacteriologist who is accustomed to treat cases with vaccines is apt to know more about the chances of success with any given case. While I am no advocate of retrograde medicine, there is much to be said in practice for our forebears' ideas of "types" and "diatheses," and this applies equally in vaccine therapy.

Patients with a high temperature are unsuitable for vaccine therapy; and in acute infections it is unwise to give vaccines. Here again one comes across notable exceptions; for I well remember one of my laboratory clerks, desperately ill with a streptococcal arm, who seemed to pick up (and finally recovered) from the first administration of an autogenous vaccine. Anyway, should you decide to give an acute infection a vaccine, start with almost incredibly small doses, and increase them by doubled amounts daily until a reaction is obtained.

Patients with conditions of great chronicity, such as chronic sinuses, particularly if there is any cause for the chronic sinus, such as a buried stitch, a piece of dead bone, etc., are quite hopeless until the cause has been removed, then healing perchance may be accelerated by the administration of a suitable vaccine. During the war there were some types of mind that insisted on requesting the bacteriologist to prepare a vaccine for chronic sinuses at the bottom of which were huge sequestra caused by comminuted fracture from shrapnel. The only legitimate reason for putting such a case on a vaccine is to increase its bacterial resistance pending an amputation or removal of sequestrum, and this may be done with benefit in such cases. In the war, I am afraid, it was sometimes asked for under the peculiar impression that the vaccine would unaided heal the sinus and remove the sequestrum. Very chronic colon bacillurias, again, are quite unsatisfactory cases, for the time to put a patient on a *coli* vaccine is in the acute stage, as soon as or, in some cases where the fever is not severe, before the temperature falls. So often I think one is inclined to give the urinary antiseptics first and the vaccines as a last resource. This I believe to be wrong, for I hold that all the "shots in the locker" should be brought to bear on the enemy, and that both vaccine and urinary antiseptics should be given. Do not let us regard a vaccine as a thing apart from ordinary therapy, but as a part of ordinary therapy—another weapon to be used in suitable cases along with drugs and surgical operations.

DOSAGE

And now we come to dosage. I have made a few observations on those who desire a standard initial dose and so forth. I believe from the nature of a vaccine such a thing to be impossible. I would go further and say that

* An abstract of a lecture to the Post-Graduate Section of the Watford and West Herts Medical Society.