ATTIC SUPPURATION

By G. S. SEED (Leeds)

ATTIC suppuration has been defined as a disease confined to the upper part of the middle ear and I am going to limit my remarks to chronic infection of the epitympanic space.

It has been said that every case of chronic otitis media begins as an acute ear and it is at this stage that it is most easily treated. I think this is perfectly true in the chronic otitis media with a central perforation, that is the meso-tympanic type, but in chronic attic suppuration there is usually a history of a very insidious onset. The patient does not go through the stages of intense pain in the ear, rise of temperature followed by cessation of pain when the ear begins to discharge. There is usually a history of very slight aching and a slowly increasing deafness with slight, often unnoticed, discharge from the ear. The condition is recognized on routine examination for life insurance or when the patient is examined prior to entering the Forces. The perforation is in Shrapnell's membrane or in the posterior superior part of the tympanic ring. There may be a dry perforation, a perforation covered by a scale of wax, one through which can be seen debris suggestive of cholesteatoma, or a perforation blocked by granulation tissue or polypus.

The direct posterior marginal perforation rarely gives rise to infection in the attic and it is usually due to a local necrosis of the tympanic ring. If the mastoid is opened it is found to be normal.

From the medical notes I have tried to get some idea of the number of patients with attic suppuration who have attended my Department at the General Infirmary at Leeds during the month of March, 1950. 675 new and old patients, about 300 new patients, were seen during this month and of these there were 189 ear cases. In this number there were 16 new patients with attic infection. The total figures for the whole year are in the region of 7,000 new patients and attendances included 11,000 old patients. These patients were seen in 1949 by two consultants and two registrars.

MARCH, 1950

New Patients	325
Old Patients	350
Total	675

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

Attic Suppuration

Number of Ear Cases	189
Number of Cases of Attic Infection ..	16

Total number of patients seen in the Ear, Nose and Throat Department at the Leeds General Infirmary in 1949 :

New Patients	7,376
Old Patients	11,491
Total	18,867

How is one to deal with this number of patients with attic infection ? Certainly some of them will resolve or the perforations will become dry with simple removal of an attic polypus or other conservative treatment with which I will deal later, but the incidence of intracranial complications is still high although much less than in the pre-sulphonamide and penicillin days.

Most of the patients admitted with intracranial complications had not attended the hospital before but had been treated conservatively by their own doctor, or had been treating themselves. The majority were complications of otitis media, mainly attic infections with cholesteatoma.

How is one to make sure that this type of patient with an attic infection is not treated lightly by a general practitioner with the patient liable to intracranial complications ?

In teaching of students and at post-graduate lectures I always try to divide cases of chronic otitis media into the dangerous and non-dangerous types or as Tumarkin puts it, " the chronic ear which gives on the one hand muco-purulent response from ciliated epithelium and on the other hand the cholesteatomatous response from squamous epithelium ". I have tried to teach the student to recognize these types without having to describe very accurately the site and type of the perforation.

I have come to the conclusion from experience in teaching and examining students in Final M.B. that the head mirror is a very difficult instrument in the hands of the student or practitioner unless he has special post-graduate training or does several months as an Ear, Nose and Throat House Surgeon. My senior colleagues would not use or allow students to use an auriscope but insisted on the use of a head mirror. There are very few practitioners who possess a head mirror and it is obviously a difficult and time-consuming effort to examine a patient in a busy surgery, using a head mirror and reflected light. A Siegle's speculum is also difficult for a student to get accustomed to owing to the reflection of the light from the lens and I think that the

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

student should be encouraged to use either a head light with battery, or an auriscope. Some of the British auriscopes are, I think, particularly bad, the light only shining at the end of the speculum and not in a direct beam. An American pattern is, I think, far superior in examination, especially for children.

Another great difficulty on the part of the examiner is the cleansing of the meatus. I think that more time should be spent in teaching a student to clean or syringe an ear rather than to expect him to know the details of any operative measure. Most authors, in describing methods of conservative treatment of chronic suppurative otitis media, have stressed the fact that the essential part is the removal of pus and debris. Lack of this precaution is probably responsible for more failures in diagnosis of attic suppuration than any other cause. Until the tympanic membrane is perfectly clean it is almost useless to attempt to form conclusions as to the site of the perforation, granulations, etc. If one had a nurse or orderly staying in the department for many months, one could perhaps train them to use a head mirror to help in the cleaning out of an ear. It is extremely difficult to train a student who perhaps attends an out-patient department one afternoon each week for a period of two or three months. It is, therefore, better to try and teach them to clean out an ear blindly using a wooden applicator or a Jobson Horn wool carrier and to concentrate on this and on syringing the ear rather than to expect them to try to use a head mirror. I think, also, that it is more important to encourage a student to gain more from the history and superficial examination of the patient than to spend a great deal of time with minute examination. To try and teach them that an intermittent mucoid discharge with exacerbations due to upper respiratory infection can be adequately treated in a doctor's surgery or health centre. If the upper respiratory tract has been pronounced clear this type of patient should not be referred many times to an Ear, Nose and Throat Department, after the diagnosis has been established and the ear pronounced " safe ". On the other hand, in the dangerous type much stress should be laid on the length of history, the slight scanty malodorous discharge with perhaps bleeding, and on examination that the perforation appears to be in the upper part of the drum head rather than in the anterior sulcus. Patients with polypi, slowly increasing deafness and an insidious discharge should be sent to an E.N.T. Out-patient Department and not treated conservatively by the practitioner. I am always repeating to students the simile I had from Dr. Elsinger of Vienna in describing a patient with attic infection and cholesteatoma " Like a man sitting on a barrel of gunpowder smoking a cigarette ". By operating one removes the barrel of gunpowder. The practitioner should also be taught that sulphonamides and penicillin are perhaps the best form of treatment for the acute ear and for the exacerbation of the non-dangerous

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

ear, but that sulphonamides may give only temporary control and impending complications may be masked in the attic type of suppuration. I have in my mind several patients who developed complications; patients who had a long history of slight offensive discharge with attic suppuration, who had acute exacerbation with pain and who were treated with sulphonamides or daily injections of penicillin and observed by the practitioner for a long period until complications became very evident.

A warning should be given about the unnecessary removal of the tonsils and adenoids in the presence of attic infection in children. Many children have been subjected to the removal of tonsils and adenoids for an otitis media when the ear showed a perforation of Shrapnell's membrane or the postero-superior marginal perforation. Adenoidectomy was done in the hope that this would clear up the ear infection but in practice it proves to be of little benefit.

The Training of an Otologist

The incidence of cortical mastoidectomies is now quite small and a registrar or resident has very much less experience now of opening of the cellular mastoid by the post-auricular route than he had in the pre-sulphonamide era. At one time one could leave a simple cortical mastoidectomy in a child to a registrar with six or twelve months' experience and he quickly became familiar with mastoid landmarks. One hesitates now to leave patients with an attic infection for operative treatment. I, myself, as a resident was responsible for most of the acute mastoid surgery at the Infirmary in Leeds and I very often had to explore a sclerotic mastoid by the post-auricular incision for acute exacerbations of a chronic suppurative otitis media.

After a considerable time finding the antrum through dense bone, usually after exposing the dura of the middle fossa, I had to decide either to leave the patient with a simple cortical mastoid or to continue to do a difficult radical or modified radical mastoidectomy. If the former was done it was an inadequate cortical operation, the patient was left with the ear still discharging from the attic perforation, to need more radical procedure at a later date. If a modified radical was done at that time a very thick bridge was laboriously taken down. The region of the facial canal was avoided; one never lowered the bridge down enough and certainly never saw the facial canal at all. The anterior part of the attic was also not seen, and as Daggett has pointed out the two triangles of bone were not removed and therefore there was inadequate exposure of the attic region. The meatal flap was then fashioned. The effect of the local anæsthetic, if used at all, had worn off and there was much bleeding and the flap was very thick. The cavity was packed tightly and the procedure of packing was repeated for several weeks or months

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

in the hope that the tight packing would keep the flap in position or that it would stop exuberant granulations.

The principle of doing a cortical mastoid first and then converting this into a radical or modified radical is, in my opinion, time-consuming and laborious. The cavity is unnecessarily large, the lateral sinus often forward and in danger of being injured. Whether the endaural route or the post-auricular route is employed, as little of the mastoid process as possible should be opened. I, myself, have had better results and have learnt more of the surgery of the attic and the middle ear since using the more direct method of endaural approach, i.e. taking away Henle's spine and approaching the antrum through the posterior superior meatal wall, as opposed to the more difficult and tedious side approach through the usual sclerotic or diploetic mastoid process.

Since Lempert in 1938 brought out the endaural approach we have seen two other methods of exposure of the attic described. First the Tumarkin pre-meatal method. I would like to pay tribute to him and say that in Tumarkin's hands this operation is excellent, the cavity small and the convalescence short. One has a complete view of the attic and antrum, facial nerve, etc., and when he is doing it the operation does appear quite simple but I would like to issue a warning that a registrar or otologist with limited experience should not attempt this without very prolonged practice on the mastoid bone. Either important structures such as the facial nerve will be injured or the extent of the disease will not be completely uncovered. I am reminded of Mosher's dictum in his presidential address that " Timid incisions means timid surgery ". There is also the method of Popper of which I have no experience whatever, but I feel that this procedure is not to be undertaken lightly. The operations may appear to be quite easy on the bone or on the cadaver but however good the anæsthetic, local or general, if the operation is done for the correct type of case with granulations in the attic and aditus, there is bound to be a certain amount of bleeding obscuring the landmarks. I think, also, that these two methods may not always give a wide open meatus which will allow future inspection and treatment. As to the method described by Daggett I cannot criticize as I have no experience of it but some otologists, I think Simpson of Hull, do the radical operation without making a large flap of the post-meatal wall. These operations are done mainly to prevent the painful dressings but what happens if the cavity does get re-infected from an upper respiratory infection ? Does the discharge escape through the external auditory meatus or does the infection pass into the mastoid cavity causing a sagging of the posterior meatal wall or perhaps bulging of the mastoid scar? The usual radical cavity, if re-infected through the eustachian orifice, which I find very rarely closes, only gives rise to a localized discharge and the cavity can be inspected quite easily.

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

Watkyn-Thomas, in a discussion in 1944, found that too often a secondary plastic was necessary to provide drainage.

The Management of Attic Suppuration

Conservative methods. An attic perforation usually indicates the caries of an ossicle or the presence of attic cholesteatoma and it is an indication for some form of radical operation unless the otologist is able to attend the patient periodically for the rest of the patient's life. During the war, when I think that chronic suppurative otitis media, especially in base hospitals, was treated better and was kept under stricter control than in civil life, the Otologist enjoyed the role of being his own house surgeon, clinical assistant and consultant. The patients could be seen at regular intervals, intratympanic swabbing and intratympanic syringing could be carried out, attic polypi could be removed and after-treatment carried out personally by the E.N.T. Surgeons. A great deal was learnt and those of us who were lucky enough to be in base hospitals during the war do not regret our experience.

In civil life, however, the problem is vastly different. With the present huge out-patient crowds it is not easy to undertake personal supervision of these patients at frequent intervals and, therefore, many more cases of attic suppuration will come eventually to surgery.

Johnston and Banham in a discussion on treatment of chronic suppurative otitis media in 1945 stressed the importance of local treatment and attic syringing and Banham gave a very high percentage of cures by this method, but these patients were all in the forces and received personal supervision by the otologists. In civil life I think a large percentage would recur. Collins in a review of the Middle East E.N.T. casualties advocated the establishment of aural treatment centres, staffed by specially trained orderlies. If centres with permanent staff such as these could be set up in large hospitals I am sure the incidence of complications would be smaller.

Operative measures. The first object in operating is to remove the potential danger to life, and if the case does not seem urgent the patient should be seen at regular intervals and both the patient and his doctor advised about the signs of impending complications.

The second object of operation is to try to preserve the hearing of the patient and if possible to improve it. The third object is to obtain a dry ear.

I have looked up the notes of modified radical mastoids done during the past two to three years, mainly for attic infection, and I would like to bring to your attention the following points :

I have tried to improve my technique from the dark and gloomy days of the post-auricular incision and side approach through the dense

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

mastoid process and, following Mr. McGuckin's example I have paid visits to my colleagues with more experience than myself, particularly Cawthorne, Daggett, Monkhouse, Passe, Thorburn and Tumarkin. The anæsthetic is usually continuous pentothal with local infiltration of the operation area with normal saline and adrenalin. I usually use the incision of Shambaugh or House, the latter, with the excision of a small area of skin, is, I think, particularly good. I have not been able to accustom myself to making a posterior flap which has been advocated by Thorburn and Passe; this protects the posterior raw edge. The most important part of the exposure is, I think, the excision of a triangle of temporal fascia which has been described by House. This gives an adequate exposure of the anterior part of the attic region, a part which is not easily seen through the post-auricular incision.

I have not yet been able to find a suitable retractor apart from the hand retractors and I think a Mollison retractor is fairly adequate but one has to be careful of the sharp prongs and in two patients I have found that these have caused damage to the lower part of the flap and incision. As regards the bony part I still use a gouge and if necessary try and smooth out the cavity with a dental burr. In all cases I open the mastoid antrum and am never happy with a simple atticotomy. I have not been able to use the flap as for the fenestration operation. There is usually some otitis externa which has caused a thickening and it is always with a certain amount of difficulty that the flap is thinned. If one does try to make the bony cavity as small as possible one finds that the fenestration flap may be too big and clumsy, I therefore use a flap turned down over the facial ridge.

As regards the dressings I have occasionally used the skin grafting method which was described by Daggett and Bateman in 1934, using wax to keep the graft in position, and I still find this a very useful type of dressing. Otherwise I use the old-fashioned BIPP or penicillin and liquid paraffin gauze. If the dressing is done about the fifth or sixth day under pentothal and no further packing used the patient can usually be discharged in ten to fourteen days to attend the Out-Patient Department for dressings.

REFERENCES

TUMARKIN, A., 1946-47, *Proc. R. Soc. Med.*, xl, 761, 772.
DAGGETT, W. I., 1949, *J. Laryng. and Otol.*, lxiii, 135.
LEMPERT, J., 1938, *Arch. Otolaryng.*, xxvii, 555.
TUMARKIN, A., 1938, *J. Laryng. and Otol.*, liii, 685, 737.
MOSHER, H. P., 1946, *The Laryngoscope*, lvi, 736.
POPPER, O., 1946, *J. Laryng. and Otol.*, lxi, 24, 441.
WATKYN-THOMAS, F. W., 1945, *J. Laryng. and Otol.*, lx, 132.
JOHNSTON, C. M., 1945, *J. Laryng. and Otol.*, lx, 303.

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press

BANHAM, T. M., 1945, *J. Laryng. and Otol.*, lx, 307.
COLLINS, E. G., 1943, *Brit. med. J.*, ii, 386.
SHAMBAUGH, G. E., 1947, *Arch. Otolaryng.*, xlv, 662.
HOUSE, H. P., 1949, *Arch. Otolaryng.*, xlix, 135.
DAGGETT, W. I., and BATEMAN, G. H., 1934, *J. Laryng. and Otol.*, xlix, 169.

https://doi.org/10.1017/S0022215100012652 Published online by Cambridge University Press