

TO WHAT EXTENT IS IT ADVISABLE TO ADOPT CONSERVATIVE METHODS IN THE TREATMENT OF AURAL DISEASES?'

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THE most difficult problem which the aural surgeon is called upon to consider at the present time is the question of when to operate, especially as so many important operations are being performed in otology and so many diverse opinions are held by operators as to whether conservative or radical methods of treatment should be adopted. We all remember how the medical press only a few years ago was filled with the report of successful attempts to improve the hearing of cases of chronic catarrhal deafness by the excision of one or more ossicles. At the present time this operation is generally condemned except in cases of caries or necrosis of the ossicles. The hearing of many of these unfortunate patients was in many instances made very much worse by this operative interference. At the present time the attention of otologists is more especially directed to the Schwartz-Stacke operation for the cure of chronic otorrhœa, the mastoid operation, and operations for intracranial complications, more particularly sinus thrombosis.

It seems to me to be the duty of those of us who are engaged in teaching medical students to impress upon them at all times the value of conservative methods in many cases; for I feel that at the present moment there is too great an inclination on the part of many to operate "too early," and that we should do well to constantly bear in mind what Oliver Wendell Holmes once said, that "Nature is kinder than the doctors think."

The majority of aural surgeons are agreed that an early incision of the drumhead is imperative, if we wish to ward off mastoiditis, particularly if the membrane is bulging and the patient has fever and pain. In many cases of streptococcus or pneumococcus infection it is wise to incise the drumhead if the patient has pain and fever, even if there is no bulging. Of late some opposition has been raised against this operation in cases of acute suppurative otitis media, but I cannot understand why one should wait for a possible mastoiditis to develop, when by an early incision we fre-

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quently prevent just such a complication. According to my experience, when the drumhead is incised early, the course of the disease is less prolonged and the patient has better hearing than when the case is left to Nature. As to the time to operate in mastoiditis, there is not by any means the same unanimity of opinion. A writer recently has said that "in all cases of middle-ear inflammation in childhood, where free myringotomy does not relieve pain and temperature at the end of a few days, the mastoid should be opened and the typical mastoid operation done, even upon no other indications than pain and temperature, and in young children considerable temperature alone is a sufficient indication." We all know how easily a child will develop a temperature, and if we rely upon this symptom alone we shall easily fall into a serious error, and run the risk of opening a healthy mastoid. Only recently I had two infants under my care. They were teething, and each suffered from an acute suppurative otitis media on both sides. They were seen early, before rupture of the drumhead had occurred, and an otitis media was suspected by the general practitioner owing to the high temperature. Under chloroform a free incision was made in each drumhead. In each instance the temperature fell at once, but the children had more or less fever for from three to four weeks, and the discharge did not cease until the children were sent into the country, when it almost immediately stopped. At no time was there any apparent symptom of mastoiditis. The blood was examined constantly for an increase of the leucocytes and the polymorphonuclear elements, and several incisions were made in the drumhead in each case at different times. I attach much more importance to the child's general appearance and condition than to a rise in temperature.

A child that is teething is likely to be irritable, to have more or less fever, and frequently a suppurative otitis media. The temperature will often continue until the tooth appears. When the latter occurs the discharge from the ear generally becomes less and ceases very soon. We are likely to fall into a serious error if we attach too much importance to fever alone in children. A short time ago I was asked to see an infant under one year, who seemed perfectly well during the morning, but in the afternoon, when a high temperature developed, the child was more or less inclined to sleep and be restless. Six physicians had already seen the child, but could not find any cause for the fever. I was asked to examine the ears; they were perfectly normal. The child recovered, but the nature of the ailment could never be explained.

Another child, a boy of sixteen months, I saw in consultation on February 10, 1906. The family physician said that on January 27 he was taken ill with high temperature and stomach trouble, and he had severe *grippe* symptoms. On February 1st the left drumhead seemed to bulge, and the doctor incised it, and since then there has been a discharge of bloody serum. The temperature remained a little lower for about twenty-four hours. The right drumhead was bulging on February 5. It was incised, and but little discharge came from it. The temperature has been lower in the morning, but in the afternoon has risen to 103° to 104° F. When seen in consultation the temperature was 101° F., and he seemed better than he had been for some time. The glands in the neck were much enlarged. As there was a small opening in each drumhead I made a free incision in each membrane. The baby made a good recovery.

We must not overlook the fact that, in some cases of acute otitis media due to the *grippe*, especially in children, the high temperature may be due to a latent pneumonia, the physical signs of which cannot often be made out for several days. I must confess to having operated on a young girl when the temperature was 106.2° F., with marked tenderness over the mastoid. A free incision had previously been made. The case was one of severe *grippe* infection, and the chest had been carefully examined, but no evidences of pneumonia could be discovered. Twenty-four hours after the mastoid operation evidences of consolidation were detected. The patient recovered. The temperature in this case was due to the pneumonia, and the patient would probably have recovered without operation as the cells were only softened, and did not contain pus. We should be careful in administering ether or chloroform in all cases of *grippe* infection for fear of setting up a pneumonia.

To show what can be accomplished by conservative methods I would refer you to a paper published in the *Archives of Otology* in 1901, in which I reported forty cases of "acute purulent otitis media, complicated by acute inflammation of the mastoid cell," occurring in private practice. In ten cases it was necessary to perform the mastoid operation, while in thirty recovery followed without operation. The latter were treated by means of the artificial leech, the Leiter coil, free incision of the drumhead and general treatment, rest in bed, etc.

Not long ago I was called in consultation to see a child that had had an acute otitis media for several days. Two incisions had

been made in the drumhead, and all preparations were made for an operation that same day, but the temperature declining suddenly, it was deemed best to wait twenty-four hours longer, and on the next day the child was so much improved that she escaped a mastoid operation. The child felt perfectly well, was happy, and slept during each night, and the only symptoms were temperature and slight tenderness on pressure over the mastoid.

It seems to the writer that it is impossible to lay down any hard and fast rules as to when the mastoid cells should be opened. Before deciding such a question we must secure all possible information bearing on the case. If the streptococcus or pneumococcus is present, and the patient is suffering from a marked toxæmia, we should not wait if the patient has well-marked symptoms of mastoid inflammation, and an attempt has already been made to drain the middle ear by a free incision in the drumhead.

In a child affected with a virulent streptococcus infection I opened the mastoid cells on the fourth day after the middle-ear infection, and found the sinus exposed and a Bezold perforation, showing clearly how rapid the destruction of bone may be in some cases. I have also opened a mastoid process in a man where there was no pain on pressure and only a slight degree of fever, but where the patient had a profuse discharge which did not yield to treatment, and he had a septic appearance. The cells were broken down and filled with pus.

On the other hand, a child may be bright and happy and appear in good condition except for the fact that an acute otitis media with mastoid symptoms causes a temperature. In these cases not only one incision should be made, but in many instances it may be repeated several times, when all symptoms of mastoiditis will frequently disappear, and the child will recover. In adults, also, we should be guided largely by the nature of the infection and the general appearance of the patient, as well as by the blood count. Daily examinations of the blood should be made in order to determine whether the leucocytosis is increasing or decreasing, and what relative changes are taking place in the cell percentage. For example, if the leucocytosis is falling and the polynuclear percentage is above normal and rising, the prognosis is not so good as when both are falling, or when the leucocytosis is increasing and the polynuclear percentage is falling. According to Sondern, "the increase in the relative number of polynuclear cells is a direct indication of the severity of the toxic infection, and the degree of

leucocytosis an absolute indication of the body resistance towards the infection." No definite rule can be laid down at present to aid the aural surgeon. We ought to have a knowledge of the normal average leucocytosis and cell percentage in each individual in order to have a rational basis from which to draw conclusions, but with other clinical symptoms a blood count will assist us in deciding when to operate.

In a study of eighty-nine cases of acute and chronic purulent otitis media with and without complications, made by Dixon at the New York Eye and Ear Infirmary, it was found that the leucocytosis in those cases with mastoiditis as a complication ranged from 5000 to 17,800, and the average polynuclear percentage was within the normal limits. It was not until the more serious complications occurred, such as epidural abscess, sinus thrombosis, and intra-cranial invasion, that the blood count began to have any very marked significance. The leucocytosis occurring in the course of intra-cranial complications does not appear to be so high as in pneumonia. As exceptions occur, we must not rely too positively upon the blood count alone.

We can afford to wait longer in children than in adults before opening the mastoid cells, because in the former the suppurative process is more likely to extend outward through the thin, soft cortex, while in the latter the inflammation is more likely to involve the cranial cavity. Of 281 cases collected by Hill Hastings ⁽¹⁾ in which the mastoid operation was performed, perisinous abscesses were found in 46 cases, epidural abscesses in 21 cases. Hastings says: "It is noteworthy that only 16 of the 67 cases were children (under ten years of age) while of the 72 cases of subperiosteal abscesses 46 were children."

The value of trying conservative treatment in chronic otorrhœa rather than the performance of the Schwartze-Stacke operation is clearly shown in the report of the following case:

A coachman, aged twenty-five, had been a sufferer from chronic otorrhœa for many years, but had had but little treatment for it. His case was called to my attention in February, 1906, owing to the fact that he had been told by a specialist in New York that he must have a radical operation performed at once. He told me that two days before he had had a chill while driving, and had been obliged to give up work and had gone to a hospital for advice. He was told that a Schwartze-Stacke operation should be performed immediately. On examination I found that he had a large fibrous polypus protruding from the right ear, and that the discharge was prevented from escaping owing to the occlusion of the canal. There was slight tenderness over the mastoid process. I advised against an immediate radical operation, although I told him that later this might be necessary. I then removed with Blake's snare and with other instruments the polypus, thereby

establishing good drainage. In about ten days' time the man was able to resume his work, and all the disagreeable symptoms disappeared.

It would have been a great hardship for this man to have submitted to an operation at that time, as he had a family dependent upon him.

I have always found great difficulty in persuading physicians who have consulted me on account of chronic otorrhœa to have any operative work performed on them. Knowing well the complications that may arise, they seem to prefer taking chances in many instances. The following case will illustrate this point:

A physician, aged thirty-five, consulted me two years ago on account of a very foul-smelling otorrhœa of long standing. The drumhead was almost entirely destroyed, and there was no obstruction to the escape of pus from the attic. There was roughened bone in the attic, but there were no evidences of cholesteatoma. I immediately washed out the attic with bichloride solution, and afterwards injected into the cavity some alcohol containing boric acid. I did not give him much encouragement as to any permanent cure from this line of treatment, but as it has invariably been my custom to commence the treatment of such cases by the use of the middle-ear syringe whenever practicable I decided to try what I could do for him on these lines, as he was strongly opposed to an operation. Much to my surprise, in a very short time there was a decided improvement. The discharge became less and the odour much less offensive. The attic was washed out with bichloride solution, and afterwards injections were made into the attic of alcohol and boric acid and other solutions. Powders were also insufflated. The improvement continued steadily, and in four months' time cicatricial tissue had formed, and the cavity was healed. I saw the patient a short time ago, and he has had no return of the discharge for two years.

I have reported numerous cases similar to this one which recovered under like treatment.

The following case is one in which the radical operation was clearly indicated:

Joseph F—, aged thirty-five, was sent to me December 29, 1905, on account of chronic otorrhœa of the right side, which he had had since he was four or five years of age. He had a constant discharge, with odour, and was troubled with an annoying tinnitus. General health fairly good. Some tenderness was present over the mastoid process at times. About one third of the drumhead on the right side was destroyed posteriorly, and on the left side the drumhead was very much retracted, and atrophic changes had made it quite thin. Hearing for the watch = R. ear 1 inch; L. ear 1 to 2 inches. Bone-conduction increased for both ears. Slightly raised voice heard a distance of 12 feet with each ear. For the past three months he had had pain in the mastoid three or four times, and during the past six months he had been troubled with headache. He was seldom free from it now. Was very dizzy for one night about three weeks ago. On January 23 a radical Schwartz-Stacke operation was performed. The usual incision behind the ear was made, and the remains of the drumhead and ossicles were excised. Cholesteatomatous material was removed from the attic and antrum, and the roughened bone of these cavities was carefully scraped. The mastoid wound was

entirely closed by sutures, and after making an incision through the length of the cartilaginous canal, the walls of the latter were pushed against the inner wall of the bony cavity by means of narrow strips of iodoform gauze inserted in the external meatus. In a week's time the mastoid wound was entirely closed, and two weeks after the operation the patient returned to his home in New London where the treatment was continued under my supervision. On February 18 epidermatisation had almost completely covered the cavity, and there was but slight discharge; and on March 18, when he came to see me in New York, the hearing for the watch was 7 inches on each side, while the voice was heard the same as before the operation.

In considering the advisability of an operation in a patient suffering from a chronic otorrhœa, we should determine whether the perforation is sufficiently free for good drainage. If the opening is large, and we can readily pass a probe into the attic, and find but little carious bone, and further if the patient does not complain of pain, headache, or dizziness, I feel that it is our duty first of all to try to cure the disease by means of injections through a middle-ear syringe. Exuberant granulations should be removed and everything done to establish good drainage. If, on the other hand, a patient comes to us complaining of frequent attacks of earache, headache, nausea, vomiting, or vertigo, and on examination we find that good drainage is impossible, owing to a small perforation (generally in Shrapnell's membrane), and that the ossicles are carious, that the discharge is foetid and contains cholesteatomatous masses; and moreover, if we detect a carious condition of the attic, we should advise immediate operation—either excision of the drumhead and ossicles, or a Schwartze-Stacke operation. In such cases the patient is also apt to have occasional attacks of mastoid pain, another indication for an early operation.

Haug of Munich ⁽²⁾ claims to have cured sixty-four out of ninety-eight cases of suppuration in the attic. He first enlarges the site of the perforation, if necessary, so that a tympanic cannula of a large calibre can be introduced. The irrigations are made with a solution of permanganate of potash or boric acid. The cavity is then dried, and a solution of perhydrol, ten parts, in water and glycerine, ten parts each, is slowly injected into the attic. The solution is retained for a quarter of an hour, with the head turned to one side. The canal is dried, and a small pledget of cotton, soaked in a strong solution of iodine-potassium iodide-glycerine. The canal is then packed with gauze. The procedure is sometimes very painful. If necessary it is repeated in ten days. Haug has never repeated this procedure more than three times, because it is without avail if the case has not healed up in that time.

In introducing a probe into the attic we often find roughened bone. This fact alone should not have especial significance unless associated with more serious symptoms. At the annual meeting of the American Otological Society, held May 9, 1905, in discussion on chronic purulent otitis media, Gruening said: "The diagnosis of the presence of carious bone is often made by the introduction of a probe. When the probe strikes something rough it is assumed that the bone is carious. The conclusion is not correct. There is often roughness without caries. In former times, when we did not resort to the radical operation, we dealt with polypi, and we cured our cases, and what happened then can also happen now. Many cases of middle-ear disease are certainly amenable to treatment by the removal of granulations and polypi."

Other writers of late years are inclined to advocate conservative measures in individual cases, and do not try to alarm all patients afflicted with chronic otorrhœa by telling them, as some have done, that they are living over a volcano, and that they must have an immediate operation.

In a practice extending over twenty-five years my observation is that the danger of an intra-cranial complication following chronic otorrhœa is very slight among private patients. During this time I have seen many cases of purulent otitis media, and I can only recall one case that developed an intra-cranial complication—namely, a brain abscess. The patient had neglected all treatment for years, and when I saw him he had an abscess in the temporo-sphenoidal lobe. He was operated upon at once and recovered. It is among the hospital patients that we find the serious complications, especially as the poor are not apt to apply for treatment until compelled to by such symptoms as pain, headache, dizziness, tinnitus, etc., and from hospital patients most of the statistics are compiled.

If the discharge cannot be cured by the use of the middle-ear syringe, the radical operation should be performed, for after the discharge has been arrested the patient's general health is apt to be greatly improved, and the danger of an intra-cranial complication is practically impossible.

The question whether or not to ligate the internal jugular vein or to excise it in all cases of sigmoid sinus thrombosis is still under discussion by aural surgeons. For a number of years I have been in the habit of not ligating or excising the vein in cases of thrombosis of the sinus, provided the clot was not broken down and

there were no evidences of thrombosis of the internal jugular vein. In such cases I have made it a rule to wait for twenty-four hours before tying the vein, with the result that during this period I have not been obliged to excise the vein.

On the other hand, if a thrombus has already formed in the internal jugular vein or the sigmoid sinus contains pus, and especially if the patient shows symptoms of general infection, the internal jugular vein should be tied at once. In a paper read before the Society of Alumni of Bellevue Hospital, April 5, 1899, on "The Importance of an Operation in the First Stage of Thrombosis of the Sigmoid Sinus," I reported three cases occurring in children under ten in which the internal jugular vein was not ligated, and said that "unless we are quite confident that the thrombus has already extended to the internal jugular vein, it seems to me more prudent to give the patient the benefit of the doubt, for ligation of the internal jugular vein adds very much to the gravity of the operation."

McKernon, at the meeting of the American Otological Society in 1905, read a paper on "Primary Jugular Bulb Thromboses in Children as a Complication of Acute Purulent Otitis Media," in which he reported six cases operated upon, four of which were successful. One case died of encephalitis of the cerebellum, and the other one, a baby six months old, never regained consciousness after the operation. The streptococcus was the characteristic infection and the polynuclear count high. McKernon did not ligate and resect the internal jugular vein in any of these cases. He says: "Had I not been able to restore the circulation here (at the bulb) I would have done so in four of the cases, but in two of them such a procedure would have been exceedingly unwise owing to the extremely weakened condition of the patient, and would have resulted in their deaths on the operating table. I believe that in the average case of sinus or bulb involvement it is wiser to ligate and resect the vein if the patient's condition will admit of it. While four of the cases reported recovered without ligation being resorted to, it was largely due, I believe, to the fact that an early operation was done rather than that all the infective material had been removed. In young children the time element is one that enters largely into a favourable prognosis, for the shorter the time that we keep our patients on the operating table the quicker will be their convalescence."

McKernon further said: "In a large proportion of children that have come under my observation the percentage of cures is

far greater without ligation of the vein because of the added risk on account of the time consumed in ligation and removal."

Some writers seem to think that it is a matter of small importance whether the sigmoid sinus is accidentally opened during the mastoid operation. This view seems to me to be a dangerous one, and I have reported, in the *New York Medical Journal* and *Philadelphia Medical Times*, October 1, 1904, a case of thrombosis of the sigmoid sinus which was probably due to accidental incising of a normal sinus. Fortunately the patient recovered.

In a paper entitled "Notes on Three Recent Cases of Sinus Thrombosis; Two fatal; One recovered; Remarks," H. Knapp says: "Wounding of the sinus has so often proved to be without consequences that its occurrence during mastoid operations is commonly considered harmless. I do not share this opinion. In the first of the cases detailed above the sinus was slightly injured. Whether this contributed in any degree to the fatal termination of the disease I am not prepared to say. I carefully avoid wounding the sinus, and always follow conscientiously the rule that the working at the sinus should be the last step of any mastoid operation."

As to ligation of the internal jugular vein Knapp says: "It saves many a life, and should be done when, after a thorough mastoid and sinus operation, the pyæmic symptoms persist longer than a few days. In the severe cases, if not in all, the facial and external jugular veins should also be tied."

In an article by Hill Hastings (³) entitled "A Report of 281 Mastoid Operations, with Subsequent Results," being a compilation of cases treated at the New York Eye and Ear Infirmary, he says: "The sinus was accidentally opened in nine cases. In eight no harm resulted; in one case sinus thrombosis followed. On the eleventh day after the operation the patient had a chill, followed by a temperature of 105° F. Although the clot was removed three days later, and the internal jugular vein ligated and excised, septic pneumonia developed and the patient died."

Pooley reports a case of mastoiditis, followed by sinus thrombosis and pyæmia, in which he says: "The sinus was infected at the time of the first operation. For the first three days thereafter improvement took place; then the sinus clot formed, with the subsequent appearance of the symptoms so characteristic of sinus thrombosis."

CONCLUSIONS.

(1) In all cases of acute otitis media attended with pain and temperature and bulging of the membrane, and particularly if the patient is suffering from a marked toxæmia and mastoid tenderness, an early and free incision should be made in the drumhead. It is only in the very mild cases that it is ever wise to defer opening of the drum membrane.

(2) We can often ward off a mastoid operation, if the case is seen in the hyperæmic stage, by the application of the artificial leech and the Leiter coil, and by making a free incision in the drumhead. In the case of young children we can afford to wait longer than in adults, and it is often advisable in infants and young children to make several incisions in the membrane rather than to perform an immediate mastoid operation, especially if the principal symptom is elevation of the temperature alone. The nature of the infection should be determined by an examination of the pus from the middle ear. If the streptococcus or pneumococcus is present in large numbers, and particularly if the patient has marked toxæmia with mastoid symptoms, an immediate operation in such cases is generally called for if the acute symptoms have not yielded to a free opening in the drumhead. A blood-count should be made daily in order to determine whether the leucocytosis is increasing or decreasing, and what relative changes are taking place in the cell percentage. In other words, we should obtain all the evidence possible about the case before deciding to operate rather than rely on fever and pain alone.

(3) In cases of chronic suppurative otitis media we should distinguish between those that require an early operation and those that can frequently be cured by conservative methods. In the former the drainage is apt to be poor, owing to a small perforation and to the opening becoming clogged with cholesteatomatous material, the ossicles are carious, and there is caries and necrosis of the attic. The patient in such cases complains of severe headache and pain in the ear, and if good drainage is not established he is likely to have nausea, vomiting, dizziness, and a possible intra-cranial complication. In the latter class of cases, if the drainage is good and the patient does not complain of any particular symptoms referable to the ear, the discharge can often be cured by the systematic use of the middle-ear syringe and the insufflation of powders.

(4) In all operations on the mastoid we should be most careful

not to expose the dura or the sinus, unless occasion requires it, for such practice has in some instances led to meningitis, and when the sinus has been accidentally opened septic thrombosis has followed.

(5) In operations for sigmoid sinus thrombosis it is often unnecessary and dangerous to excise the internal jugular vein at the same time, especially in the case of children, for the longer the time the little patient is under the anaesthetic the more grave becomes the prognosis. If the operation is performed early and the clot has not begun to disintegrate, it is generally unnecessary to ligate and excise the internal jugular vein even if we do not secure a flow of blood from the bulbar end. In such cases it is wiser to postpone further operative interference for at least twenty-four hours.

REFERENCES.

- (1) *American Journal of the Medical Sciences*, January, 1905.
- (2) *German Medical Society Archives of Otolaryngology*, No. 6, 1905.
- (3) *American Journal of the Medical Sciences*, January, 1905.

DISCUSSION.

Dr. GEORGE L. RICHARDS (Leicester, Mass.) was in hearty accord with Dr. Bacon, especially as regards the frequent possibility of avoiding a mastoid operation in young children. In this connection he wanted to mention the use of $\frac{1}{10}$ -gr. granules of calcium sulphide, given hourly, until there was some odour of the sulphur in the breath or sweat, then less often. He had found this remedy apparently help in the process of recovery, a previous free incision of the drum membrane having been made.

Dr. W. PEYRE PORCHER (Charleston, South Carolina) pointed out the great advantage of conservatism and the advisability of investigating the etiology of ear disease more carefully. Many cases were due to and dependent upon nasal obstruction.

Dr. J. A. STUCKY (Lexington, Kentucky) said that the extreme temperature referred to was not due entirely to the inflammatory condition of the ear, but often to intestinal toxæmia, caused primarily by the locking up of the secretory and excretory functions as a result of the violent pain in the ear. Free purgation and flushing of the colon, in addition to free myringotomy, often acted as if by magic. The artificial leech and Leiter's coil were to be used with extreme caution, especially the latter. He might also mention the danger in using the syringe of lowering the vitality of the parts, and of conveying new infectious material into the delicate and susceptible middle ear; in this way the simple trouble might be converted into a serious mixed infection. This danger should be impressed upon the general practitioner, who usually first saw these cases and exhausted the so-called conservative treatment before he brought the case to the otologist. It should be made clear that the most conservative treatment was often early surgical interference.

Dr. S. MACCUEEN SMITH (Philadelphia) thought that those of them charged with the teaching of students should be moderate in advising

radical measures, at least, not until simpler ones had failed. Early free incision of the membrana tympani was most important in all acute cases complicating the infectious diseases. Simple puncture of the membrane should never be attempted, as it could not provide ample drainage.

Dr. JAS. F. MCKERNON (New York) said that the extract from his former paper quoted by Dr. Bacon might make it appear that his method of treatment had changed since the writing of that paper; but, if it were read fully, he thought that it quite coincided with his present attitude. In the bulb cases referred to thirty-four had been reported to him since the reading of the paper.

Dr. EDWARD J. BERNSTEIN (Kalamazoo, Michigan) asked what effect the use of chloroform and hot-water irrigation, according to the views of Sir Victor Horsley, would have upon the radical mastoid operation, more especially when one felt it would be necessary to ligate the jugular.

Dr. HENRY SMURTHWAITE (Newcastle-on-Tyne) said that the greatest percentage of cases that came under their notice was of the chronic class, and that it would never have reached such proportions had systematic and thorough treatment been adopted at the inception. If statistics were taken of deaths directly attributable to untreated and unrecognised (by the patient) middle-ear disease, the number would be considerable. He himself knew of three cases of deaths that occurred in one week due to cerebral and cerebellar abscess, in which the parents had no idea that an ear discharge had been present. It was among the poor that most of the fatal cases occurred, for the simple reason that running ears were looked upon as of little danger, and were not attended to unless pain were present. If the poor were instructed to have their children's ears attended to on the first appearance of a discharge the death roll would be reduced. In the acute cases it was far better to make a big incision in the drum and let out pus early than to allow it to burst through. Incision favoured early healing and lessened the risk of destruction, permanent thickening of the lining membrane, and consequent impairment of hearing.

Mr. HUGH E. JONES (Liverpool) said that it was much better to open the mastoid cells, or even the antrum, in acute suppurative otitis too soon and too often, than too late. The immediate cessation of discharge through the tympanum and rapid resolution gave better results as to hearing. A fallacious resolution of the mastoid sometimes occurred, leaving foci of infection in deep cells which broke out again, possibly into the groove of the sinus, six or twelve months later. In chronic cases one often found that the removal of a well-formed polypus led to a rapid cicatrisation of the tympanum. The question of latent abscess having been raised, the speaker remarked that he had for years insisted upon the fact that many cases of latent brain abscess were walking about, and he had sought himself and had asked others in vain for a crucial clinical test for this condition. He thought the danger of opening the actual sigmoid sinus accidentally during mastoid operation had been exaggerated. In an experience of about five hundred mastoid operations he had often opened the bony groove accidentally, but never the sinus itself.

Dr. HERBERT TILLEY (London) wished to refer to two cases recently under his care which showed how impossible it was to lay down any general rule for the treatment of the graver complications of suppurative otorrhœa.

Case 1 was that of a female, aged twenty-one, who for five weeks had suffered from right suppurative otorrhœa following influenza. It was stated that she had had three shivering fits before admission to the hospital and constant attacks of

severe headache. Upon admission she was anæmic, and looked very ill. Mentally she was in a drowsy condition. Pulse 72; respirations 13 per minute; temperature, 102°. Well-marked optic neuritis in right eye, the pupil of which was dilated and did not react to accommodation. No other paralysis noticed. There was slight pain on pressure on the right mastoid, but no signs of acute inflammation in this region, nor in the region of neck corresponding to situation of jugular vein. The mastoid antrum and cells were exposed, and also the lateral sinus; only healthy blood escaped from the latter. There was a small quantity of pus in the antrum, but the roof of the tympanum and antrum seemed quite healthy. The temporo-sphenoidal lobe was exposed and bulged very much through the large opening (2 in. by 1 in.) made in the bone above the bony meatus. Pus was sought for in five directions, but without success, and the wounds were stitched up with the exception of the post-aural mastoid incision, into which a large drainage-tube was fixed. The patient rapidly recovered, and without a bad symptom. The rapid disappearance of the optic neuritis was especially noticeable.

In such a case it was difficult to say what was the cause of the patient's symptoms, but it would seem probable that the temporo-sphenoidal lobe had been infected by way of the lymphatics from the middle ear, and that the operation at least relieved tension, and possibly was the means of affording an outlet for septic micro-organisms. It was indeed a rare type of case, but a similar one had been described before the Neurological Society of London.

Case 2.—The patient was a schoolboy, aged seventeen. Six weeks after the onset of influenza he was seen by the speaker on account of a temperature which rose every evening to 101° or 102° F., and there was a purulent otorrhœa of three weeks' duration accompanied by slight earache. When examined, the patient seemed in good spirits, and there were no signs of any mastoid involvement. The drum membrane was congested, perforated in the lower posterior quadrant, and the deep posterior meatal wall was not swollen. It was decided to keep the patient in bed and administer aperients—salicylates, etc. After an interval of forty-eight hours a rigor occurred (temperature 105° F.), and the speaker opened the mastoid antrum, the mastoid cells, and exposed the groove of the lateral sinus. There were about 2 minims of pus in the antrum, and the neighbouring cells were inflamed, but the rest of the bone was hard, pale, and healthy. Five hours after the operation a second rigor occurred, and an examination by Dr. Colbeck and Mr. Ballance failed to ascertain the cause of rigor. An interval of two days followed, when a third and fourth rigor occurred. During this time the mastoid wound appeared healthy, there was nothing to indicate involvement of the lateral sinus, and the patient's general condition was excellent. After the second rigor frequent injections of antistreptococcic serum were made, and after the fourth rigor the patient rapidly improved and made a speedy convalescence.

Such cases as these taught them the uselessness of trying to lay down hard-and-fast rules as to when a mastoid antrum should be opened, or an internal jugular ligated, or when this or that treatment was indicated. General principles there must always be, but that surgeon would be most successful who was untrammelled by rules and was guided only by his experience and the demands made by the symptoms of the individual case which was before him.

Dr. CLARENCE J. BLAKE (Boston) was in accord with Dr. Bacon and with the emphasis laid by the last speaker upon the importance of dealing with each case on the basis of its individuality. Accidental wounding of the lateral sinus might be met by rapid enlargement of the opening in the inner mastoid wall. The lateral brain-pressure crowded the vein into the enlarged opening, stopped hæmorrhage by pressure, and safeguarded the vessel.

The PRESIDENT expressed his sympathy with the conservative ideal. It was said of one great surgeon that he never wasted a word, a drop of ink, or a drop of blood. One operation in aural surgery which could

hardly be done too early, and which was often postponed too long, was the opening of the mastoid cells in acute suppurative otitis. It was essentially conservative, and had saved many tympanic apparatuses which would otherwise have remained crippled for hearing purposes and a source of the dangerous sequelæ incident to chronic suppuration of the middle ear.

REPLY.

Dr. GORHAM BACON, in reply, said he was glad to find there was not much opposition to the statements contained in his paper. He felt that Dr. McKernon and he were quite in accord in regard to excision of the internal jugular vein. He went farther than Dr. McKernon in waiting twenty-four hours after removing the clot (one that had not begun to disintegrate) before ligating or excising the vein, to see if the patient had any further symptoms of sepsis. Dr. McKernon said that in weak children he waited before ligating the vein. In a certain number of cases where the typical operation was performed early, and the internal jugular vein was excised, the patient died. The cause of death was not given, but he believed it was the shock of the operation, and for that reason he thought that they should not resort to ligation and excision of the vein unless absolutely necessary; he had therefore been advocating conservative methods for some years. Dr. Richards had referred to sulphide of calcium in suppurative cases. The late Dr. Sexton advocated its use, and the speaker had given it for a time, but did not feel that its administration was followed by any especial benefit, particularly after the *grippe* made its appearance. As to the remarks made by one of the speakers about the number of chronic cases seen in hospital practice, he was compelled, owing to the time limit, to omit what he had written on some statistics. In private practice he had seen only one intra-cranial complication following chronic otorrhœa during a period of twenty-five years. So that among private patients he felt that such a danger was a slight one. Most statistics were compiled from hospital cases, and among them they got their intra-cranial complications. He had seen a case similar to that reported by Dr. Tilley. The patient had had *grippe* and a mastoid operation had been performed, but he seemed to become very stupid, had a temperature, and respiration was as low as 8. The speaker opened the cranial cavity, explored the temporo-sphenoidal lobe, the cerebellum, and sigmoid sinus and found nothing. In a few hours the patient began to improve and recovered. He thought that the local depletion very likely relieved the congestion in a commencing meningitis. He wished to thank the President and the members of the Section for the privilege of having been allowed to read his paper.

THE OTOLOGICAL SOCIETY OF THE UNITED KINGDOM.—The annual meeting will be held at 4 p.m. on Monday, December 3. The annual dinner will take place the same evening at 7.45 p.m. for 8 o'clock at the Trocadero Restaurant.
