The Journal of
Laryngology and Otology

(*Founded in* 1887 *by* MORELL MACKENZIE *and* NORRIS WOLFENDEN)

ZYGOMATIC MASTOIDITIS.

By W. M. MOLLISON.

THE type of mastoiditis which spreads forward and tends to form a temporal abscess must be fairly common in the experience of all aural surgeons; nevertheless it is curious that more attention has not been directed to it in the text-books. Text-books should reflect the generally accepted teaching and thus be of help to practitioners and students, but reference to recent works on the ear fails to discover mention of "zygomatic" mastoiditis.

The number of cases of mastoiditis presenting swelling in front of and above the ear and involving the temporal fossa is not large compared with the usual type of mastoiditis, but they are sufficiently numerous to demand a description that will allow of their recognition by the student and practitioner. The signs of zygomatic mastoiditis are in many cases completely different from those of the common form. The percentage of such cases is probably about two or three; in the experience of the writer it is higher than that of Bezold's mastoiditis.

Recently, an excellent paper on the subject by Holmgren appeared in the *Acta Laryngologica* entitled, "A Less Noted Type of Mastoiditis." In this paper Holmgren states that twelve cases had been seen in his clinic in a year, but he does not mention what percentage this was of the total number of cases of mastoiditis: he states, in one place, "that this type of mastoiditis is of frequent occurrence," but later he says "cases of zygomatic mastoiditis are far from rare." These two estimates are scarcely similar, and the latter phrase gives a more correct idea of the frequency of the disease.

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press

That attention should be drawn to this form of mastoiditis will be agreed; it must be within the experience of most aural surgeons to have seen cases of abscess in the temporal region, in which the ear as a possible cause has not been contemplated by the practitioner.

Symptomatology.—Clinically, the condition of zygomatic mastoiditis presents very definite features, and the diagnosis should offer little difficulty; sometimes diagnosis is made less obvious owing to the absence of some important symptom or sign (*e.g.* absence of otorrhœa) as may occur in cases of the usual type of mastoid inflammation.

The term "zygomatic" expresses the main features of the condition; in the course of an otitis media, pain is experienced in front of the ear, and a swelling appears in the temporal fossa either immediately in front of the pinna and above the temporo-mandibular joint, or somewhat further forward. The swelling is occasionally so far forward as to appear unconnected with the ear; later, it involves the side of the head up to the insertion of the temporal muscle, and the face, particularly the eyelids: indeed, slight œdema of the eyelids may be perceptible before swelling of the face is noticed.

Owing to the inflammation of the tissues about the temporo-mandibular joint, there is considerable pain and difficulty in opening the mouth and in performing mastication; later still, the skin over the swelling becomes red. Tenderness is marked, especially just in front of the ear over the root of the zygoma; there is often, but not always, tenderness over the mastoid process.

Otorrhœa is generally found, but the writer has seen one case in which no otorrhœa was present, and the tympanic membrane was not much inflamed, though incision yielded pus.

Deafness is always to be noted and is a valuable sign in the absence of otorrhœa; even deafness may be very slight as was the experience in the case of A. B. recorded later.

Pathology.—On referring to the literature, one is impressed with the statement in almost all the accounts, that zygomatic mastoiditis occurs in those cases in which the zygomatic cells are unusually developed. Escat mentions the "temporal periosteal abscess" as due to zygomatic cells, and describes its treatment. Denker and Brünings state, "In rare cases, when there is great development of cells in the root of the zygoma, pus can break through under the periosteum." When discussing acute

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press

mastoiditis, Barr, in the 1909 edition of his *Diseases of the Ear*, states, "When an abscess forms, the soft parts over the mastoid region and sometimes extensively over the squamous and other parts in the neighbourhood are more or less swollen and œdematous. . . . The bone in the neighbourhood, especially over the root of the zygoma, may be thickened."

This is almost the only reference to the subject in the text-books. In some of the most recent works no reference is to be found to the condition.

French writers have emphasised the zygomatic type of mastoiditis; Escat, as we have seen, mentioned it, and, in 1920, Mouret and Seigneurin wrote a long and full account of the disease; in their paper Luc is quoted as having noted it specially. This paper was published before that of Holmgren, but the latter's work was carried out over the same period.

Though development of the cells in the outer attic wall towards the root of the zygoma is apt to cause the suppuration to spread forwards and so lead to zygomatic mastoiditis, it is by no means necessary that there should be cells in the bone in front of the post-meatal spine in order to produce the condition. In the absence of cells, infection of diploë is sufficient to account for the disease spreading forwards and leading to the formation of a sub-periosteal abscess: it is not obvious why the sub-periosteal abscess should pass so far forward as it sometimes does; perhaps the tension of the temporal muscle and temporal fascia over it has some influence. In the posterior part of the temporal fossa the fibres of the muscle run almost horizontally and are fairly tightly bound to the bone, while, in the centre of the fossa, the fibres are vertical and give more room for inflammatory material to collect underneath.

All cases of zygomatic mastoiditis do not develop abscesses; in the early stage when the squama is the site of inflammation, the bone at operation shows points of either pus or granulation; at a later stage, pus is found under the periosteum, and at a later period still the temporal muscle is found softened and partly replaced by sloughy tissue forming, as it were, the abscess wall.

In some cases these temporal abscesses are found in the middle of the fossa, separated from the points of sepsis in the bone by apparently healthy tissue; no doubt, infection in these cases has been carried by small vessels passing through the bone to the periosteum; indeed it is very doubtful if any so-called

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press

direct spread of suppuration in mastoiditis occurs; it is much more probable that the infection spreads by the blood-vessels. It is possible for infection in the temporal fossa to pass inwards to the dura, and set up an extra-dural abscess or other variety of cranial complication, though such an occurrence is rare. [*Note.*—Ogilvie's case brought before the Section of Otology, the Royal Society of Medicine, 17th February 1922.]

Holmgren publishes several radiograms of the temporal bone demonstrating very well the cells in the squamo-zygomatic portion of the temporal bone. From the study of these radiograms and as the result of anatomical investigations, he finds that these cells may not form a continuous group, but that there may be a separation into two groups, an anterior group quite separated by non-cellular bone from the posterior cells. This observation has an important bearing on the operation; on tracing the infected cells forward, the limit of suppuration may apparently be reached, but on further exploration more suppuration may again be found.

This observation is certainly borne out by operative experience, and no doubt the case of A. B., Case IV., quoted later, was a striking example of complete separation of a small group of cells from the main mass.

The following cases are examples of the condition :—

Case I.—A boy of 10 developed a small swelling in the right temporal fossa; a few days previously he had had slight earache, but this was only temporary.

The swelling was in the temporal fossa above the zygoma; it was about 1½ inches in diameter, smooth and tender; the skin was not red over it, nor was fluctuation detected. The boy was deaf, hearing whispered words at a few inches. The tympanic membrane was slightly reddened, but not markedly bulging. The membrane was incised and pus escaped; the mastoid process was then opened; points of suppuration were found throughout the bone especially in the cells of the outer attic wall, and the swelling was found to be due to an abscess under the temporal muscle and periosteum. The boy made an uninterrupted recovery.

Case II.—Vivian D., aged 12, a schoolboy, contracted influenza and developed pain in the left ear, followed by slight otorrhœa, which ceased after two days. He continued to suffer from pain, and at the end of a week a swelling appeared in the temporal region; the swelling and pain gradually increased in spite of local and general treatment. At the end of the second week the following condition was found:

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press

the whole of the left side of the face was swollen, and there was some œdema of the eyelids, the most prominent part of the swelling being over the posterior part of the zygoma, where the skin also was red. The boy complained of much pain, which prevented sleep; he was unable to open his mouth more than enough to swallow fluids, and any attempt to bite was very painful. The swelling was extremely tender, and there was slight tenderness over the mastoid process. The left tympanic membrane was dull and bulging, and the superior deep meatal wall was sagging; there was no pus in the meatus. The boy was deaf, whispered words being heard at 2 or 3 inches distance from the ear.

At operation, points of granulations were found throughout the mastoid, and on investigation of the outer attic wall some granulations were found, but in no part of the bone was pus actually discovered. The periosteum over the squamous part of the temporal fossa was stripped from the bone by a large collection of pus, and the muscle was softened by inflammation, and about one inch in front of the external auditory meatus there was a small superficial erosion of the bone just above the zygoma.

The swelling of the face did not disappear for a week, but eventually healing occurred satisfactorily; on the other hand, six weeks after the operation, the hearing had only slightly improved.

It was most unfortunate that the case was not operated upon sooner; the practitioner in charge had never seen a similar case, and so he did not associate the swelling with the early ear symptoms.

The absence of pus in the bone, notwithstanding a large subperiosteal abscess, is a point of some interest, though it is a feature of a certain number of cases of acute mastoiditis. Again, the cessation of otorrhœa may be noted, though it would not have prevented the diagnosis in view of the otoscopic findings.

Case III.—Cyril J., aged 10, developed a left-sided acute otitis media; the membrane ruptured and otorrhœa continued for ten days. The temperature at first was raised to 102° F., but gradually fell until there was only a slight rise in the evenings. At this time there was some redness and bulging of the posterior superior quadrant of the membrane; after a few days of treatment with drops of Glycerinum acidi carbolici the membrane was freely incised. The boy now improved, the temperature fell to normal, and he was able to go out for walks; at the same time otorrhœa continued. Three days later, a swelling appeared in the temporal region; it gradually increased and became tender.

The picture was now typical of a temporal abscess consequent on zygomatic mastoiditis.

At operation, points of suppuration were found throughout the

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press

mastoid process and in cells in the outer attic wall. The subsequent history of the case was unsatisfactory; the meatus became very much narrowed as the result of having to separate the fibro-cartilaginous meatus from the bone in order to expose the outer attic wall thoroughly; a sinus persisted in the wound possibly as the result of the narrowed meatus. A further operation was required to deal with the meatus.

In spite of satisfactory removal of tonsils and adenoids eighteen months before, the patient developed acute otitis media. Though the original perforation was in the posterior superior quadrant, suppuration in the bone spread forwards. Separation of the soft part from the bony meatus is always a mistake on account of possible stenosis, and in these cases is very difficult to avoid, so that after zygomatic mastoiditis some stenosis is probable. (*Note.*—The boy subsequently developed right-sided acute otitis followed by zygomatic mastoiditis.)

Case IV.—Ann B., aged 9, suffered from acute otitis and mastoiditis for which a simple mastoid operation was performed by Mr Butler of Guildford. The case made a good recovery, the wound healed perfectly, and the child's hearing improved to nearly normal. Fourteen days after the operation the child complained of some pain in front of the ear; this was not accompanied by any rise of temperature and passed off in three days. She was apparently well and returned home. Nine days later, or about four weeks after operation, the pain in front of the ear returned and the temperature rose to 100° F., and a slight swelling appeared over the root of the zygoma.

Examination by the writer at this time showed a slight swelling above the root of the zygoma; it was rounded and about 2 cm. in diameter; the root of the zygoma was tender, but the scar of the previous operation was soundly healed. The tympanic membrane was normal in appearance and the child heard whispered words at 9 feet. A diagnosis of residual zygomatic mastoiditis was made.

Mr Butler operated and reported that there was some pus in the temporal fossa and in one or two small cells in the outer attic wall; he dressed the wound with Bipp and closed it; recovery was uneventful.

This must be a most unusual case; at the original operation the outer attic region was investigated and gave no indication of special infection. The suggestion made is that there was an area of apparently healthy bone between the posterior part of the outer attic wall and the cells at the root of the zygoma. On the other hand, might this be a possible sequel to the use of Bipp and the immediate suture of the wound in a case of acute mastoiditis?

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press

Case V.—A girl, aged 14, seen at Guy's Hospital, had had left-sided otorrhœa for three weeks; this had ceased and a swelling had appeared over the upper part of the mastoid process. She had pain for the most part above the ear, but also in front of the ear. She could not open her mouth to the full extent on account of a feeling of pressure in front of the ear. The left temporal fossa was distinctly full; the pinna was pushed forwards and downwards by a swelling which was tender and over which the skin was somewhat red; the tip of the mastoid was obscured.

There was in the meatus epithelial debris and the membrane could not be seen as the superior deep meatal wall was sagging. Operation showed pus in the mastoid process and a cell the size of half a pea full of pus in the outer attic wall and reaching forwards to the root of the zygoma.

This case might be called a combined case of mastoiditis and zygomatic mastoiditis, or, as Mouret has named it, para-mastoiditis.

These cases are examples of the condition of zygomatic mastoiditis, and they show that it presents a very definite clinical picture.

In Holmgren's paper some excellent photographs are published of patients showing the swollen face that is typical of the condition.

Conclusions.—1. Zygomatic mastoiditis gives a definite clinical picture.

2. To a great extent the affection arises on account of the anatomical condition of the squamous portion of the temporal bone.

3. Operation must always explore the outer attic wall to exclude extension forwards of disease.

4. There is some tendency to stenosis of the meatus after operation.

https://doi.org/10.1017/S0022215100023902 Published online by Cambridge University Press