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## EXOSTOSIS OF EXTERNAL AUDITORY CANAL.

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OSSEOUS growths in the external auditory canal are of quite frequent occurrence, and become of special interest mainly in consideration of their etiology and the various operative measures employed when their removal is indicated.

Unless these newly developed bone masses become of sufficient size to cause intense pain by direct mechanical pressure, offer obstruction to the free discharge of inflammatory accumulations in the tympanic cavity, or seriously impair the hearing by functioning as a foreign body, or influencing by pressure or adhesions any portion of the sound-conducting apparatus, a surgical interference may not be deemed an absolute necessity.

The etiology of the majority of cases of exostoses of the external auditory canal is often shrouded in mystery.

According to many authorities, syphilis and the rheumatic and gouty diatheses play important rôles as causative factors. Heredity is also a factor frequently noted. The most tangible and comprehensible cause, yet one not often met with, is that of a long-standing direct irritation and chronic inflammatory condition of the walls of the external auditory canal.

The text-books classify osseous growths in the aural canal into (1) congenital exostoses; (2) acquired exostoses.

Much interesting information on this subject, especially referable to the etiology, has been gathered by the extensive researches of Seligman, Wyman, Blake, Virchow, and others. The exostoses found by Seligman with such relative frequency in the examination of the crania of North American Indians seem to belong, with perhaps few exceptions, to the class of *congenital* growths, as distinguished from *acquired* exostoses.

Blake examined one hundred and ninety-five skulls of the mound-builders of Tennessee, now in the collection of the Peabody Museum in Cambridge, Mass. In thirty-six exostoses were found in one or both canals, as well as narrowing of the canals.

Moos does not endorse the syphilis, rheumatic, and gouty diathesis theories. He notes in the cases that came under his observation that the point of development of the exostosis was invariably from the upper wall of the external auditory canal, almost at the distal extremity. He

advances the opinion that these growths are the result of irritations occurring during the development of the temporal bone : the uniting of the annulus tympanicus with the squama.

Virchow, in the examination of one hundred and thirty-four Peruvian Indian skulls, found exostoses in eighteen. Contrary to the opinion advanced by Moos, he describes the outer part of the osseous external auditory meatus as the point of predilection ; he does not cite a single case in which the exostosis developed at the margin of the pars tympan, as noted by Moos.

The conclusions thus far reached, then, indicate that even the special and detailed investigations of careful and experienced observers are at variance.

That the frequency of exostoses in the aborigines of America may be due to certain race peculiarities, such as artificial elongation of the skull induced by pressure during infancy, seems possible, and could be further substantiated by the statistics furnished by Bezold.

In the examination of one thousand nine hundred and eighteen German school children, Bezold does not record the existence of a single case of exostosis.

Welcker, on the contrary, claims "that these exostoses are not extremely rare among the cultured population of Europe, and, as shown by the text-books and C. O. Weber's collection, the external auditory canal is a favourite position for them."

Retaining the classification of exostoses into congenital and acquired, we note in recent otological literature (with the exception of the investigations of the crania of aborigines) the extreme rarity of the congenital form.

Contrary to the rule in other parts of the body, exostoses in the auditory canal are generally painless. The point of origin in the development of the case herewith recorded has been definitely determined to be at the outer portion of the osseous external meatus, close to the junction of the cartilaginous with the bony portion of the posterior wall of the auditory canal.

Henry C., aged twenty-three years, presented himself for treatment with the following history :—Three years ago patient suffered with an acute earache of two to three weeks' duration. The aural canal was swollen and painful on slightest pressure ; the sensitive area included the domain of the facial nerve of the affected side, as indicated by impaired motor function ; hearing was considerably impaired. Several acute exacerbations recurred in this series of symptoms, each of about three days' duration.. Some relief was gradually afforded by constant applications of dry heat and warm instillations in the ear.

Convalescence being established, patient was then annoyed by frequent itching sensations in the aural canal, which he temporarily relieved by the counter irritation of matches and toothpicks vigorously applied. Even this pruritic attack subsided in a few weeks, and no further attention was given the ear until shortly before his application for treatment, when he complained of a disagreeable feeling of obstruction, intense deafness, and occasional pain in the left ear.

On examination I found the left ear assuming a position at right angles to the side of the head ; the orifice of the canal was very large, filling up its entire lumen ; and appearing within half an inch of the external opening of the canal was a rounded mass, offering considerable resistance to the touch of the probe, pale red in colour, somewhat painful on pressure. With a very thin probe I was able to circumscribe the convex surface of the tumour, tracing its point of fixation to the posterior wall of the auditory canal.

As to the character of the growth, nothing further could be determined ; I supposed it to be a large, dense, fibrous polypus, and made preparations for its removal accordingly. The patient was anæsthetized, as even the manipulation of examination caused considerable pain and vertigo. A number four piano wire was passed around the tumour, and a very firm traction applied to a Wilde-Blake snare. When the wire was drawn taut about the tumour it snapped as though it were a cotton thread. Three other wires were adjusted, with the same result. My suspicions were now aroused as to the nature of the growth. Incising the integument covering of the tumour, the point of the knife met with much resistance ; this, on closer examination, revealed its bony structure.

From the large size of the snare loop I judged the tumour to be of considerable depth, probably extending the entire length of the osseous portion of the canal, and perhaps involving the annulus tympanicus, with attachments deeper in the delicate structure of the petrous bone. The question suggested itself : would the application of mallet and chisel, under the circumstances, be a justifiable and advisable one ?

Removal with the mallet and chisel has frequently been resorted to, but the difficulties of the operation, the small working area in the aural canal, the delicacy of structure of the surrounding tissues, the concussion of the mallet in this area, all constitute decided objections to such a procedure.

The most successful operative results have been attained with the dental engine and drills. Obstruction of the field of operation by blood and bone dust thrown forth by the drill often make the use of the dental engine somewhat impracticable.

However, simple measures in surgical technique should always be given the preference over complicated mechanism whenever applicable.

The working area for the introduction of an instrument behind the tumour was limited, but after several attempts I succeeded in placing a long, shallow, concave curette over the convex surface of the tumour, and with a gentle, firm leverage the mass was suddenly loosened, and carried with the curette out of the canal. The slight hæmorrhage ensuing was easily arrested by brief application of a gauze tampon. The canal was found fairly clear. The shape of the walls appeared somewhat distorted ; the portion of the drumhead which was visible appeared congested and irregular in surface, with a medium-sized perforation in the posterior inferior quadrant. The canal was irrigated with a warm three per cent. carbolic acid solution, dried, dusted with iodoform, and lightly packed with gauze.

The differential diagnosis of this case presented some difficulties. As the tumour completely filled the lumen of the canal, very little could be determined as to its mobility, area of attachment, and consistency. Fortunately, the elasticity of the anterior wall of the canal permitted circumscribing with the probe and the introduction of the flat curette. The pedunculated character of the growth was determined only on examination of the mass after its removal, and an inspection of the canal wall to which it had been attached.

As a suppurative otitis media existed at the time of operation the tumour was constantly bathed in pus, and presented the appearance of a large, hard, fibrous polypus. Again, as pain was one of the principal symptoms, and the complaints of the patient only of a few days' duration, and the interior of the canal presented a picture of congestion and inflammation, it might also have been reasonable to suppose that we were dealing with a large furuncle in the depth of the canal.

Only after the outer covering of the tumour had been incised and the underlying bony tissue revealed was the real character of the growth established.

On examination, the exostosis was found encased in an elastic capsule closely adherent to the bone. The outer surface of this capsule appeared to be epithelial in character. With some difficulty the capsule was stripped from the underlying bone and exposed to view. A large ivory exostosis, irregular in surface, with several small but well-marked pedicles on the side where it had been attached to the wall of the canal, were seen.

The tumour measured one and a-half centimètres in its long diameter and one centimètre in its short diameter. The illustration represents



FRONT VIEW.



SIDE VIEW.

the specimen in front and lateral view, actual size, after stripping it of its fibrous envelope. The net weight of the exostosis was five hundred milligrammes. One of the special features to be observed in the development of this exostosis was the large size of the growth, dependent for its attachment on two slim, delicate pedicles.

Considerable inflammatory reaction followed the removal of the tumour, the patient suffering pain for several days; the canal was much

swollen ; a severe otitis media with profuse discharge, and of about ten days' duration, was also a disturbing sequel. The mild dry antiseptic treatment, however, soon evinced its restorative influence, resulting in a healthy appearance of the meatus in three weeks. Hearing tests indicated an almost complete restoration of the functioning power of the affected ear.

### **A CASE OF EPITHELIOMA OF THE MIDDLE EAR.**

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#### **With REPORTS OF TWO CASES OF EPITHELIOMA OF THE EAR Treated by Injections of Pyoktannin,**

By GRIFFITH C. WILKIN.

IN reporting a case of this nature before the Hungarian Otological Society, October 15, 1897 ("Rev. Hebd. de Lar.," April 9, 1898), Hulti mentions that but twenty cases are to be found recorded in the literature of the subject. Whether or no an absolutely exhaustive search, such as Hulti does not specifically claim to have made, would add to this number I am not in a position to say. When reading up the subject two or three years ago I met with a number considerably under twenty. On the other hand, I have, during the last five years, met with three cases, and have heard of one at first hand, and none of these have been hitherto reported in one of the special journals. In the belief that the literature would not be so very scarce if all instances were brought forward, and in the hope that other cases may be forthcoming from readers of the JOURNAL, I insert the following notes, which unfortunately are far from complete, as the patient passed out of my hands before a detailed report of the history could be obtained.

The patient, a stout Jewish woman of fifty, came to the hospital in the beginning of October, 1897, complaining of foul discharge from the left ear, with a considerable amount of pain, which had been on the increase since June or July. She gave a history of otorrhœa, with which she had been troubled on and off since childhood. No serious aural treatment seemed to have been adopted ; the condition of the ear appeared to have given rise to no special attention or anxiety. Facial paralysis was absent. On examination the inner half of the left meatus was found to be occupied by polyp of ordinary appearance, and bathed in foul pus. The polyp was removed with the snare, and as the patient was sensitive and nervous no further examination was made, but antiseptics were ordered, and instructions given to return in two days' time. This, however, she failed to do, and it was not until driven by severe pain that she returned seven weeks later. She reported that the pain, relieved for the time, had returned with increasing severity, that blood had been found in the now copious discharge, and, further, that at some