TUBERCULAR MASTOIDITIS WITH SEQUELLAE: MULTIPLE OPERATION: COMPLETE RECOVERY.*

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Clinical observations have shown that careful routine examinations of suppurating middle ears and suspicious mastoid wounds for tubercle bacilli demonstrates the presence of these bacilli with surprisingly increasing frequency.

Brieger, in his exhaustive article on "Middle Ear Tuberculosis," published in the Transactions of the German Otological Society, Vols. 9-10, March, 1913, states that "the appearances of middle ear tuberculosis,—in spite of the many characteristic pictures presented,—are not typical enough to make possible by themselves a dependable diagnosis." But given a clinical picture, either in the middle ear or in the operated mastoid which suggests a tubercular condition, if the region is irrigated with a saline solution and this solution then treated according to the method outlined by Drs. Cocks and Dwyer, the presence or absence of the tubercle bacilli can be positively demonstrated and the diagnosis established beyond a doubt.

As a fairly complete illustration of the healing of a decidedly tuberculous process involving the entire structure of the ear, I have selected a case to report to you which I have had under constant treatment and observation for something over two years.

M. M., a female patient, seven months of age, of Irish parentage, was referred to me by Dr. W. B. Coley, March 22, 1914, with a history of having had a discharge from the right ear for six weeks, following an apparently slight cold. During these six weeks she had been running a temperature and evidently suffering considerable pain, as she was very fretful and wakeful at night.

The mother stated that during the last three or four weeks she had noticed that the child had been unable to close the right eye, evidently a beginning facial paralysis.

Both parents were healthy and well and there was no tuberculosis in either of their families. The child's three older brothers and sisters were all perfectly well. The patient had always been a strong, healthy baby until she had the cold which resulted in the middle ear abscess and mastoid.

The child was very much emaciated, and had a temperature of 101°, pulse 144, respiration 24. Chest and abdomen negative. Ex-

amination of the ears showed the left ear normal; right ear, o. m. p. a., with a complete sagging of the external canal wall. There was a purulent discharge, but inadequate drainage. The mastoid was tender all over, and the tissues around the external ear were infiltrated, producing a diffuse furuncular condition. In addition, there was a profuse purulent nasal discharge.

The child was sent to the hospital at once and was operated upon the same day, the usual simple mastoid operation being performed. The mastoid process was completely involved. The mastoid cells (which were quite fully developed) were thoroughly cleaned out. The external canal wall was incised anteriorly, posteriorly, and below to give a thoroughly free drainage.

For the next few days, the outer dressing and the packing of the external canal were changed daily, a wet dressing being applied. The condition seemed to progress fairly favorably, the temperature ranging from normal to 102° , the pulse varying from 120 to 144. None of the stitches held, however, but all sloughed through. In other words, there was no healing process between the surfaces and the wound gaped wide open. However, the child slept better and took its nourishment better, and was discharged from the hospital on the eighth day, being thereafter brought in daily for dressings.

The wound did not granulate, but assumed an unhealthy grayish appearance. The von Pirquet test was then made, and gave a strongly positive reaction. At the same time, the mastoid and external canal were washed out with normal salt solution, which was sent to the laboratory and treated according to the method described by Drs. Cocks and Dwyer, and numerous tubercle bacilli were found.

It was then decided to give the child tuberculin, and she received one minim of a 1-1,000,000 dilution, beginning on April 8. From then on she received regularly two injections a week, increasing each dose by one minim, up to ten minims. This was continued for several weeks. Then a dilution of 1-100,000 was started, and a dose of one minim given in the same way, this dosage also being increased regularly until ten minims were reached. This ten minim dosage was again held for a while. Then a dilution of 1-10,000 was started and continued in the same way. The tuberculin treatment was continued regularly for a year.

To revert to the local condition. In spite of arduous and daily dressings the furunculosis continued. The infection was most vir-

ulent. There was a foul smelling discharge from both the external canal and the mastoid wound; but in spite of this the facial paralysis which had been noted before the operation cleared up and the child seemed to be gaining in general strength.

However, five weeks after the operation the infection from the discharge from the middle ear and furuncle invaded the parotid gland, forming a large abscess, and the child again developed a facial paralysis on the right side, this time more marked.

On May 20, 1914, the child was again sent to the hospital and the parotid abscess was opened. A small incision was made just in front of the tragus and a considerable amount of thick pus was evacuated. A grooved director passed down evidently entered the substance of the parotid gland, and with a curette all the necrotic tissue was removed. A counter opening was made into the external auditory canal, and the whole wound was packed with gauze wet with a one per cent formalin solution and a wet dressing was applied. At the same time the unhealthy granulations in the mastoid wound were curetted.

The child's temperature, which had been 102.2° , immediately began to fall, reaching normal on the third day, at which time she left the hospital.

The aggregate amount of foul smelling pus that came from the child's various wounds was almost inconceivable, and yet she continued to gain in weight and improve in general appearance.

The upper cervical lymph glands of the right side became involved and finally broke down into a large fluctuating mass a little below the mastoid wound.

On July 16, 1914, the child was again sent to the hospital, for the third time, and this mass of suppurating glands was dissected out.

The tuberculin treatment was continued, as already stated, throughout the entire summer and winter of 1914-15, until the end of March. Then, as the purulent discharge from the middle ear still continued, a culture was made from the pus. *Streptococcus haemolyticus* was found and an autogenous vaccine prepared. She was given injections of this autogenous vaccine through April and May, 1915.

The discharge from the various wounds diminished gradually and finally ceased, and the mastoid wound healed. The purulent nasal secretions also ceased. During this time the child gained steadily in health and strength,—indeed, became quite robust.

On July 14, 1915, she was again brought to me after having been away for several weeks. Her mother reported that she had been awake all the previous night with pain, again in her right ear. Her temperature was then 105.2°, pulse 137, respiration 44. There was a swelling behind the ear in the old cicatrix, which was tender and fluctuating. There was also a discharge from the ear, which had commenced suddenly.

She was immediately sent to the hospital and prepared for a radical mastoid operation. The usual incision was made through the old cicatrix and the soft parts were separated. There was pus and granulation tissue deep in the wound, and when the writer commenced to ream out the unhealthy bone around the aditus it was noted that the entire posterior bony canal wall seemed to move. Further dissection revealed the fact that nature had separated the whole skeleton of the mastoid process together with all the posterior canal wall, thereby practically performing a radical mastoid operation. This entire large sequestrum was removed *en masse* and sent to the laboratory for examination. Such unhealthy bony tissue as surrounded the sequestrum was curetted away, especially over and around the temporo-sphenoidal lobe, where quite a large area of the dura was exposed, as was also a considerable part of the lateral sinus.

The usual flaps were cut, and the posterior incision was sewed up except for a small drain at the lower extremity, and the wound was packed in the usual manner through the auditory canal.

The child's temperature immediately dropped to normal. The next day it rose to 104.4°, and gradually came down, not going again above 102° on the second day, when it reached normal and so remained.

On account of the large area of exposed dura and the previous tubercular condition, it was feared that possibly a meningitis might develop, but no signs of this appeared at any time. Furthermore, all the stitches in the cicatrix held splendidly and the skin remained perfectly healthy in appearance. When the drain was removed from the bottom of the mastoid wound another washing with saline solution was run in the external canal and out through the small opening at the lower extremity of the wound. This was also examined in the laboratory for tubercle bacilli, but none were found. The child made an excellent convalescence, and was able to leave the hospital on July 28, 1915, two weeks after the operation, returning daily thereafter for dressings of the radical mastoid, which proceeded to heal, normally and healthily, in the usual time.

Since then the mother has brought the child in regularly every month. The little patient has remained perfectly well and strong, and has gained greatly in weight until when I saw her last on May 2, she presented the appearance of an unusually healthy and normal child. She has not had a single cold all winter.

Since the healing of the radical mastoid last August, there has been no discharge from the ear, which is dry and healthy. The facial paralysis still exists, but is gradually diminishing, and the child can now partially close the lids of the right eye.

Pathological report by Dr. J. G. Dwyer: The sequestrum includes a skeleton of all the mastoid process down to the external semicircular canal. Histological examination of the sequestrum shows typical tuberculosis of the bone.

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Nasal Affections and Deafness. SYME, W. S. (Glasgow), *Glasgow Medical Journal*, March, 1916.

The writer lays stress on the great influence of nasal and naso-pharyngeal affections in the causation of deafness. Among other naso-pharyngeal conditions which lead to tympanic and Eustachian catarrh, he attaches considerable importance to irritation caused by excessive cigarette smoking. In reference to the nasal passages proper, posterior turbinal hypertrophy is the most frequent cause of ear trouble, being in this respect second only to adenoids. Indications for nasal treatment in cases of middle-ear deafness associated with anterior turbinal enlargements, and septal deformities are less clear, but improvement of the hearing not infrequently follows operative treatment of these conditions, especially when the deafness is of moderate degree, the tympanic membrane remains freely movable, and inflation by the catheter leads to decided increase of the hearing. Cases of inner-ear deafness, and of otosclerosis not associated with adhesive tympanic changes must, of course, be rigorously excluded. The question cannot be decided by the result of a single experimental inflation. Even when the latter leads to no change in the hearing, a gradual improvement does take place in some cases after nasal treatment. It is important also to bear in mind the possible baneful effect on the middle-ears of nasal suppuration and especially of accessory sinus disease. GUTHRIE.