REPORT OF A CASE OF SEROUS LABYRINTHITIS AND EXTRA-DURAL ABSCESS. OPERATION; RECOVERY.*

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Serous labyrinthitis may arise during the course of acute or chronic suppurative otitis media, or after operations on the middle-ear and mastoid. It is more common in those cases of acute otitis media and acute exacerbations of chronic middle-ear suppuration where there is also an involvement of the mastoid cells. The post-operative type is usually seen after extensive mastoid surgery, although it may follow minor operations on the middle-ear (as ossiculectomy, removal of polyps). It may occur from a few hours to five (or more) days after operation.

The inflammation extends to the perilymph and endolymph by the absorption of toxins or bacteria, through the intact membranes of the foramen rotundum, the foramen ovale, and healed fistulae, or by means of the blood and lymph channels. The post-operative type must be considered a collateral edema. That type where there is no entrance of bacteria but only of toxins into the labyrinth, has been termed from a pathological standpoint, "toxic labyrinthitis." Clinically the picture is the same. In either case there results a coagulation of the perilymph and endolymph, and serous exudation. The organ of Corti may show degenerative changes.

The onset may be sudden or gradual. The temperature may be normal or slightly above normal. The pulse is usually rapid. The patient complains of tinnitus, dizziness, nausea and disturbances of equilibrium. Those cases whose development is gradual show at first symptoms referable to inflammation of the perilymph. Hearing tests show the hearing greatly impaired, but give the picture of obstruction of sound-conduction. The vestibular apparatus reacts. Spontaneous nystagmus is present, and may be to the diseased side or to both sides. In the latter case it usually is more pronounced to the diseased side. It is rhythmic and rotatory. Occasionally the nystagmus consists of wide sweeping movements of the eyes from side to side. With the full development of the disease and the involvement of the endolymph, spontaneous nystagmus is

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directed toward the healthy side. Vertigo, nausea and disturbances of equilibrium continue.

Those cases in which the onset is sudden give the latter picture on our first examination. The patient is absolutely deaf on the affected side, both for speech and for tuning forks. (Theoretically hearing may be present, but this is extremely problematical). The vestibular apparatus may or may not react to the caloric test. Fortunately in the great majority of cases it does react (caloric test). There may be facial paralysis of the affected side.

Recovery is the rule and is rapid. Spontaneous nystagmus becomes daily of less degree and disappears. Vertigo, nausea and disturbance of equilibrium cease. Caloric nystagmus if negative soon becomes positive. The vestibular apparatus being very resistant finally is little, if at all, affected. Hearing returns more slowly, and the inflammation may leave the patient absolutely deaf or with greatly impaired hearing. Hearing in many cases returns to normal. Facial paralysis when co-existent rapidly disappears with the restitution of the vestibular function.

Serous meningitis and facial paralysis may exist as complications. The facial paralysis in this connection is due to a serous exudation around the perineurium or in the nerve itself. Diffuse suppuration may supervene.

Serous labyrinthitis must be differentiated from acute suppurative labyrinthitis (arising during the course of severe general infections as scarlet fever and diphtheria), and chronic circumscribed labyrinthitis, and chronic manifest or chronic latent diffuse suppurative labyrinthitis. In the first class the picture is obscured by the severity of the symptoms of the general infection. The differential diagnosis to be of any value must be made before the appearance of meningeal symptoms. This can only be accomplished by the caloric test (in serous labyrinthitis, usually positive and in the suppurative type always negative). Whether the use of the caloric reaction in this type of case, acute suppurative labyrinthitis, is or is not a dangerous procedure is still a debatable question. This statement does not apply to the employment of the test in serous labyrinthitis where it is harmless, or in the several forms of chronic labyrinthitis where its use, in the light of our present knowledge, is imperative.

In chronic circumscribed labyrinthitis we have a history of previous symptoms referable to the labyrinth (attacks of dizziness, etc.), and we may elicit the fistula symptom (compression nystagmus). The differential diagnosis may be very difficult in those

cases of serous labyrinthitis where a circumscribed labyrinthitis has pre-existed. Here we may get the same previous history and also the fistula symptom. However, in these cases the differentiation is not of such great importance, since the treatment of the two conditions is identical.

The differential diagnosis between serous and chronic diffuse manifest suppurative labyrinthitis is of the utmost importance and is usually readily made by means of the caloric test. This reaction is always negative in diffuse suppuration (the vestibular apparatus not functioning), and nearly always positive in serous inflammation of the labyrinth. (When the caloric test is negative, we must also take into consideration the general condition of the patient and the severity of the symptoms referable to the labyrinth. In manifest suppuration fever is always present, pulse rapid, and the vestibular symptoms, nystagmus, dizziness, etc., are severe. Nevertheless, in cases where the caloric reaction cannot be elicited, the differential diagnosis is practically impossible). Diffuse latent suppurative labyrinthitis may be recognized by the caloric test and by the absence of symptoms referable to the vestibular apparatus. In this connection may be mentioned tubercular labyrinthitis. The progress of this disease is so slow that the patient rarely if ever shows any vestibular symptoms, but only complains of increasing deafness and pronounced tinnitus. Tubercular labyrinthitis rarely leads to tubercular meningitis.

The treatment of serous labyrinthitis per se is not surgical, but constitutional (rest in bed, diet, etc.). The treatment of the underlying condition is surgical. When serous labyrinthitis arises during the course of acute or chronic otitis media and mastoiditis, the appropriate mastoid operation should be performed at once. Following the operation the patient must be carefully and closely watched and the functions of the internal ear frequently tested. If during the course of the disease we find the patient to be entirely deaf, proved with the Sound Block or Laerm-apparat, and if there is absolutely no reaction to the caloric test, (and where a fistula exists there is no fistula symptom), a labyrinth operation is immediately indicated. While it is true that by adhering to the above indications a small proportion of cases will be operated upon where resolution would take place without operation, nevertheless it must be remembered that in serous and diffuse suppurative labyrinthitis, before the appearance of meningeal symptoms, the labyrinth operation properly performed has practically no mortality.

Following the recovery of the patient hearing-tests should be made at intervals to determine the degree of impairment. The vestibular function of both sides should be compared for the same purpose.

REPORT OF CASE.

Grace D., aged 22, entered the Washington University Hospital, February 20, 1911. On January 17, 1911, had severe pain in the left ear, followed by discharge. There was no history of previous ear-trouble. For the five days previous to her entrance in the hospital she complained of excessive tinnitus, dizziness, nausea, vomiting, and disturbance of equilibrium (falling towards the healthy side).

Examination. Temperature, 98.2° F.; pulse, 120; respiration, 56. Rotatory nystagmus to the left. Patient became dizzy during examination and fell to the right. Aural examination showed marked sagging of the post-superior wall of the external canal, extending to the isthmus. The rest of the lumen of the canal at this point was filled with a soft polyp. Profuse purulent discharge. The mastoid showed slight tenderness on pressure, no redness, but little swelling, and slight edema. Hearing tests (proved with Sound Block); whispered speech, 18 in.; tuning forks, C not heard, c₄ heard; Weber "in head." No fistula symptom. Taken to operating room.

Operation: Polyp removed. Simple mastoid operation. The outer surface of the mastoid was nearly normal. Mastoid cells were necrotic, broken down, filled with pus and largely destroyed. Sinus was laid bare by the necrosis and its external wall was covered with granulations. There was a perisinus abscess and extradural abscess extending back 2½ inches from external canal. Inner plate of bone was necrotic to the same extent, and the dura was covered with granulations. All necrotic bone removed and wound dressed.

The first day after the operation: Temperature, 99.9° F.; pulse, 96; respiration, 26. Patient says she feels good. Has "strange feeling" in head, but only slight pain. Rotatory nystagmus to right (healthy side). Hearing, questionable. Second and third days post-operation: Temperature, 100° F.; pulse, 100; respiration, 24. Patient says she feels dizzy. Rotatory nystagmus to right but less than on the first day post-operation. Complete deafness in left ear. Caloric reaction positive and fairly prompt. By the fifth day post-operation nystagmus had disap-

peared. Temperature, 99° F.; pulse, 90; respiration, 24. Complete deafness. Caloric reaction positive. Recovery was rapid and uneventful. Examination March 20, twenty-eight days after operation showed the membrana tympani to be practically normal, no perforation. The operative wound was healing very rapidly. There was still complete deafness on the left side.

Examination March 29, 1911, thirty-six days after operation. Hearing tests: whispered speech 3 feet, c1 heard, c4 heard, (proved with Sound Block), Weber to the left.

The above is a fairly typical case of serous labyrinthitis of gradual onset. The labyrinth became involved during the course of an acute otitis media with extensive bone-involvement. The functional tests showed an involvement of the perilymph, followed later, after the simple mastoid operation, by extension to the endolymph. There were definite symptoms referable to the labyrinth—tinnitus, deafness, vertigo, disturbance of equilibrium, spontaneous rotatory nystagmus. The vestibular function was at no time completely lost—proved by the positive caloric reaction. Other inflammations of the labyrinth are eliminated by the history, absence of the fistula symptom, and the positive caloric reaction. The diagnosis is further confirmed by the partial restoration of hearing. How complete this restoration will be, is at present a matter of conjecture. At no time was the labyrinth operation indicated. Nor do I think the radical mastoid operation to have been indicated. The history and the findings at the time of the operation pointed so definitely to an acute inflammation, that the simple mastoid operation, with careful removal of all diseased bone, seemed the proper procedure. The fortunate termination proves the rationale of this treatment in this particular case.

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