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REPORT OF A CASE OF OTITIS MEDIA SUPPURATIVE, CHRONIC, RIGHT, MASTOIDITIS; OPERATION FOLLOWED BY MENINGITIS, AND ON POSTMORTEM EXAMINATION, FINDING OF OLD ABSCESS IN THE TEMPOROSPHENOIDAL LOBE OF THE BRAIN.

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James B., private, Company 5, Second Train Engineers, was admitted to the Walter Reed General Hospital, July 25, 1918, complaining of a discharge from the right ear.

Family history good.

History of present disease: Seven years ago had earache, followed by discharge from the right ear. This condition cleared up and he remained well until about two months ago.

Objective symptoms: Aside from the purulent discharge from the right ear, there appeared no other essential disturbances. July 9th a small amount of granulation tissue was removed from the external auditory meatus, a swelling which appeared yesterday back of the auricle subsided, and the discharge from the canal was more profuse. The ear was ordered douched every three hours with hot normal saline solutions, and for several days there was no appreciable diminution in the quantity of secretion from the ear. August 16th, complained of pain in head, frontal and occipital regions, mentality very dull, meningeal involvement suspected, but this opinion was not concurred in by medical consultant. Eye-ground showed nothing abnormal on ophthalmoscopic examination, pain over mastoid with some swelling.

August 19th, the usual mastoid operation was done, and on removing the cortex of the mastoid the bone was found

densely sclerosed. Three distinct foci of pus were found, one near the tip, one in the outer angle, and one forward near the zygomatic cells. All diseased bone was removed and a fairly free opening made into the aditus, the wound dressed with gauze soaked in a solution of dichloramin-T in chlorococane. The patient was returned to the ward in good condition. August 21st, he passed a restless night, complaining of no pain, mentally not clear; temperature 103. August 22nd, mastoid dressing removed, cavity dry, but large quantity of pus on dressing coming through external auditory canal. Wound further explored but no diseased bone discovered. A large opening was made through the aditus to the middle ear. The dressing was reapplied. August 23d, general condition seems improved and mentally clearer; temperature still elevated. August 26th, passed a very restless night, complaining of pain in head, referred especially to the frontal and occipital regions. Today he is in a stuporous state—pupils react slightly, spasticity of neck and arms, marked Kernig on left side, patellar reflexes absent, no Babinski present, eyes showed no fundus changes, no choked disc. Lumbar puncture done; fluid found under moderate pressure turbid and streptococcus present. In consultation with the Chiefs of the Medical and Surgical services, the diagnosis of meningitis was confirmed and it was agreed that no further operative measures were indicated. August 27th, the patient died, 1 a. m. The temperature was normal until August 8th, when it rose to 103, again dropping to normal until August 15th, slowly rising to 103 for the rest of life. The pulse followed the temperature changes, ranging from 76 to 120, 160 at death. Respiration, 18 to 30; 50 at death.

Laboratory findings: X-ray, right mastoid cells obscured. July 27th, throat smear, no streptococcus present. August 24th, W. C. C. 20,200, 90 per cent neutrophilia, 10 per cent lymphocytes and transitionals. August 19th, discharge from right ear, yielded streptococcus hemolyticus. August 25th, secretions from mastoid yielded streptococcus hemolyticus.

The following is a report of the autopsy record as far as the brain is concerned:

Diagnosis: Purulent inflammation of pia arachnoid, mastoiditis, meningitis.

Specimen is a large, fairly well fixed unsectioned brain. Pia mater of the lateral and superior surface of the hemisphere deeply infiltrated by thick layer of greenish yellow gelatinous purulent exudate. This exudate is especially notable along the superior frontal convolutions and over the frontal lobes, where it extends deeply into the sulci. This exudate separates easily from the surfaces of the gyri, which are softened and evidence typical superficial cortical encephalitis. The subphial exudate is in some places 4 mm. in thickness, especially over the frontal lobes. The underlying veins are tortuous, congested with dilated lymph sheaths which are infiltrated by pus.

Membranes of the base are not so extensively involved but show moderate amount of thickening, infiltration and congestion, with underlying superficial cortical encephalitis with more extensive necrosis over the tips of the temporal lobes and along the gyri recti.

The membranes about the base of the cerebellum and pons are moderately adherent, matted together, slightly thickened, and contain pus pocket superior to the corpora quadrigemina lying within the valum interpositum, and extending laterally into the chroid plexuses of the lateral ventricles, especially on the right side, where it is continuous with an extensive abscess cavity reaching from the tip of the temporal lobe backward through two-thirds the length of the lobe and communicating with both the occipital and the temporal horns of the lateral ventricle, but separate from the anterior end of the temporal horn by a thin lamina of granulation tissue.

The walls of the abscess cavity are composed of soft, purulent granular material, containing occasional blood clots and masses of necrotic brain material. This granular hemorrhagic exudate has involved the ependyma of the above mentioned horns, especially the occipital, which presents a dull, slimy appearance. The lateral choroid plexuses are infiltrated by yellowish purulent material. The frontal horns of the lateral ventricles and the third ventricle also show an acute purulent ependymitis.

Basal ganglia and internal capsules are moderately hemorrhagic, edematous, and show beginning diffuse inflammatory changes.

MICROSCOPIC EXAMINATION.

1. Frontal cortex. The overlying membranes show moderate round cell infiltration with a few polymorphonuclear leucocytes about the walls of the blood vessels. The membranes as a whole are only slightly thickened. The deeper cortical vessels and also those of the white substance present greatly thickened and deeply infiltrated walls. This exudate is composed of fibrin, lymphocytes, plasma cells, and polys, involving mainly the tunica adventitia, which is closely packed with these cells. The white substance shows notable increase in neuroglia cells and mononuclear wandering types. In the cortex the ganglion cells are somewhat shrunken.

2. Temporal cortex. Sections from the left side show widely dilated perivascular lymph spaces. The pathologic changes in general resemble those of the frontal region except that they are somewhat less extensive.

On the right side, sections from the margin of the abscess are filled with pus cells, hemoglobin pigments, mononuclear wandering cells, numerous macrophages and areas of necrotic tissue loaded with cell debris. The polymorphonuclear elements predominate. The cortical structures are obliterated by exudate process. A few new formation capillaries are noted as well as a few strands of organizing fibrous tissue in all sections.

3. Precentral cortex. The blood vessels of the overlying meninges are dilated, filled with blood pigments and an increased number of white elements, and surrounded by numerous mononuclear cells. The meninges in general are only slightly thickened, and there are very few superficial cortical changes. The smaller cortical capillaries are especially prominent, and a large number of mononuclear cells are noted in all areas. All tissues appear edematous.

4. Cerebellum. Presents an active meningitis with also numerous chronic inflammatory elements accompanying the membranes deeply into the cerebellar fissures. Many of the meningeal vessels show fibrous thickening and some complete occlusion by fibroblasts.

The purkinjan cells are reduced in number, the protoplasm is very pale, homogeneously stained. Nissl substance com-

pletely absent in some, leaving the nucleolus as the only prominently stained structure. The granular layer is notably reduced in width.

SUMMARY.

1. Acute purulent leptomeningitis, with chronic inflammatory cell infiltration.
2. Large temporal lobe abscess, with necrotic walls.
3. Secondary cerebellar changes.

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BRAIN.

Brain weighs 1,490 grams. There was a considerable amount of turbid fluid beneath the dura. Looking at the base of the brain, the pia arachnoid in the region of the pons and medulla and adjacent portions of the cerebellum is very opaque in appearance, and between the medulla and both lobes of the cerebellum and extending in between the lobes of the cerebellum in that region is a distinct yellowish deposit. On the extreme outer portion of the left lobe of the cerebellum is a thick yellowish deposit. A thick yellowish deposit is seen at the extreme anterior part of the brain on the anterior face of the frontal lobes. In the fissure between the frontal and temporal lobes the pia arachnoid is distinctly infiltrated with a greenish yellow deposit. There is a distinct sinking in of the tissue of the posterior portion of the temporal lobe as the brain rests on its dorsal aspect, and on palpation the interior of the right temporal lobe is either a pus cavity or a mass of soft necrotic tissue. Looked at from its dorsal aspect, the vessels of the brain are all congested, as they are on the under aspect, and there are very distinct greenish yellow patches of exudate in the pia arachnoid involving the anterior and inner one-third of the frontal lobes. Back of the exudate on the frontal lobe on the left side, there is an irregular area of exudate about 60 mm. in length running along the longitudinal fissure and extending out laterally at its farthest point 40 mm. The exudate dips down on the mesial aspect of the hemisphere for a distance of about 15 mm. Further out on the left hemisphere is another irregular infiltration on the pia arachnoid of greenish yellow material having a general dimen-

sion of about 20 by 15 mm. On the right side of the brain is a similar exudate in the pia arachnoid, but it is only about one-half or one-third of the size of the one just described. The whole brain feels unusually soft, probably due to autolytic changes, as the body was kept for sixteen hours without being placed on ice.

BACTERIOLOGIC EXAMINATION.

Cultures from the turbid excess of fluid beneath the dura from the mastoid wound, from the two small loose fragments of bone mentioned above, from the clot in the lateral sinus and from the heart's blood yielded streptococcus hemolyticus.

A section of the temporal bone showed a small necrotic process in the roof of the tympanum, through which possibly the pathologic organism may have been transferred to the brain.

The abscess of the brain was probably an old one which gave no evidence of its existence during life. The meningitis was also probably present before operation and was lighted up by the operation on the mastoid.

FIGURE 1.
A section of the brain showing seat of an extensive abscess in
the temporosphenoidal lobe.