III.

REPORT OF A CASE OF SPONTANEOUS HEMORRHAGE FROM THE LATERAL SINUS OCCURRING SIX DAYS AFTER SIMPLE MASTOID OPERATION.

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The clinical picture of lateral sinus thrombosis is too well known to require description, but this case showed one rather unusual feature—that of spontaneous hemorrhage occurring after simple mastoid operation, and subsequent hemorrhages after ligation.

The patient was admitted to the hospital April 20, 1918, complaining of pain in the right ear. Age, twenty-one years; previous occupation, railroad brakeman. Family history negative. Past history: Mumps, measles and whooping cough in childhood; no previous ear trouble. Present history: Had been having severe pain in the right ear for the past two days following a severe "cold," some headache and malaise. Physical examination showed a well developed and well nourished young man weighing about 180 pounds. Findings were negative; throat, heart and lungs normal. Urine examination negative.

Otoscopic examination showed on the right a normal canal with the membrana tympani red and bulging. No mastoid edema but quite tender over the tip of the mastoid process. The left ear was negative. Examination of the nose showed a fairly straight and nonobstructive septum. Examination of the throat showed moderate sized tonsils with no evidence of disease. No adenoids.

Free incision of the membrana tympani under local anesthesia immediately was performed. Following this there was a serosanguinous discharge from the middle ear and relief of pain. Temperature on admission was 101.8. Tenderness

over mastoid persisted in decreasing degree for two days and then subsided. Next day after his admission his temperature was normal. The discharge gradually changed in character to thin purulent and became less in amount. The middle ear process apparently subsided and the membrana tympani began to resume normal color.

On the eighth the middle ear was only slightly moist, and normal landmarks began to be seen. On the tenth day the ear was dry. On the twelfth day temperature became elevated to 103 in the morning and 104 in the afternoon. The ear apparently was convalescing. Examination of the throat showed follicular tonsillitis, the tonsils being reddened and showing follicular exudate. Temperature was lower the next day, and on the fourteenth day it was normal. The throat still remained inflamed until the eighteenth day after his admission while the ears were negative. It was considered that his temperature was due to his tonsillitis.

On the nineteenth day the patient complained again of pain in the right ear, and examination showed the membrana tympani red and bulging. Temperature was 102.4. The membrana tympani was freely incised under local anesthesia with a relief of pain and resulting thin purulent discharge. The canal was negative, and there was no mastoid tenderness or edema. The next morning the patient's temperature was normal. As the ward was in quarantine at this time because of a case of scarlet fever, it was impossible to have a radiograph examination.

On the afternoon of May 10th, twenty days after the original onset of otitis media, the patient had a temperature of 103. The ear was discharging freely. There was no mastoid tenderness or edema, but considerable preauricular swelling. This appeared at first to involve the parotid gland. Following consultation with the medical service, the patient was put under observation for mumps. Next day his temperature dropped to 100. On May 12th, discharge from middle ear was quite profuse and the superior canal wall showed a distinct flattening. The membrana tympani was red, swollen and boggy. The mastoid periostium felt somewhat thickened and there was slight tenderness over the tip. The preauricular swelling remained the same. Temperature, 102.2. Diagnosis

of acute mastoiditis was made and simple mastoid operation was immediately performed under ether anesthesia.

Usual incision—cortex exposed and found to be bleeding. There was a large pneumonic mastoid with cells broken down and containing free pus. There was a considerable number of zygomatic cells. Antrum was opened and mastoid completely cleaned out. The sinus was exposed over its upper part and found covered with granulations. Light pressure with the back of the curette upon these caused a small spurt of pus through the thin but apparently solid plate of bone covering the sinus below. The granulations were not disturbed. The sinus was uncovered well below the digastric fossa. One strip of iodoform gauze was inserted with end in antrum and wound partially closed with silkworm gut.

The next day, May 13th, the temperature was 101 and the patient felt fine. Wound was clean and there was but slight discharge from the middle ear. Temperature remained normal for the next two days. The wound was clean and the middle ear almost dry.

May 16th, four days after the operation, the patient had a chill, following which the temperature went to 104. The packing was removed from the mastoid, and the sinus seemed to be pulsating, with a very slight discharge from the middle ear. White blood count, 6,400; differential; polymorphonuclear, 93; small mononuclear, 3; large mononuclear, 2; transitional, 2. Blood culture showed no growth for forty-eight hours. That evening, temperature was 103. The next day, May 17th, the patient seemed better. The middle ear was dry; there were no chills. Temperature that evening, 102. White blood count, 9,600; differential; polymorphonuclear, 72; small mononuclear, 11; large mononuclear, 15; transitional, 2.

On the morning of May 18th, temperature was normal and the patient felt fine. At 4:00 p. m., six days after the operation, the patient had a spontaneous hemorrhage from the lateral sinus, apparently from the upper portion, that part seen covered with granulations at operation. The hemorrhage was controlled by packing under aseptic conditions. There were no chills. Temperature that evening was 101.6. The next day, May 19th, the patient looked rather septic. Temperature,

100 in the morning, 104.4 in the afternoon. White blood count, 16,800; differential; polymorphonuclear, 72; small mononuclear, 11; large mononuclear, 7.

On May 20th, the patient had a second chill, following which temperature went to 103. White blood count, 13,000; differential; polymorphonuclear, 85; small mononuclear, 5; large mononuclear, 10. The patient was seen in consultation with Major Harris, and it was deemed advisable to ligate the internal jugular vein. The operation was immediately performed under ether anesthesia. A one inch horizontal incision in the crease of the neck at level of the thyroid was made—dissection with Mayo scissors, vertically along anterior border of sternomastoid muscle—carotid sheath found and internal jugular vein exposed and ligated with two chromic catgut sutures. Wound closed with one buried catgut suture, the skin with silkworm gut. Mastoid reopened. Sinus incised and, despite attempt to block off, it was impossible to remove portion of the lateral wall because of profuse bleeding. No obliterating thrombosis was found. The sinus was packed with gauze plug and wound closed. Temperature that night, 102.

The patient reacted well from operation and seemed to be in good condition the next day; temperature, 102. White blood count, 13,400; differential; polymorphonuclear, 75; small mononuclear, 18; large mononuclear, 7. Blood culture still showed no growth.

On May 22d, the patient's temperature was 102. There was some nausea and vomiting, not projectile in character; pupils equal and reacted to light and distance; reflexes were all negative. The middle ear was dry. The packing was removed from the sinus without bleeding. This was reopened with a sterile probe and bleeding ensued. White blood count, 10,200; differential; polymorphonuclear, 85; small mononuclear, 9; large mononuclear, 6. The patient was put on temperature baths and colonic irrigations. There was no spontaneous nystagmus and hearing was still preserved in ear. The next day he had a chill, following which his temperature went to 104.4. There was no nausea or vomiting. The middle ear was dry. Medical consultation showed "myocardial element somewhat impaired, no acute condition found." Neck was swollen and somewhat indurated about wound, although this

was apparently healing nicely. This was reopened, sutures removed and neck explored under cocain anesthesia. About two ounces of pus was evacuated from under the sternomastoid muscle. The wound was flushed out and light drain inserted. This was apparently due to infection from the buried catgut suture. The next day, May 24th, the patient was feeling better, middle ear was dry and the packing was removed from the mastoid wound. Temperature, in the morning, 101.8; afternoon, 103.2, rectal.

On May 25th, the patient had another chill, following which temperature went to 104.4, rectal. Blood culture showed growth of streptococcus hemolyticus; 125,000,000 units of mixed streptococcus vaccine were given. May 26th, the patient complained of pain in the right shoulder joint. Nothing was evident on examination. Temperature, morning, 100; afternoon, 103, rectal. May 27th, the shoulder was still painful. There was some coughing, but nothing pathologic was found in the chest. Slight serous discharge from neck wound. There was another spontaneous hemorrhage from the sinus, easily controlled by a plug of gauze. Temperature, morning, 102.8; afternoon, 104.2, rectal.

May 28th medical examination showed "pleuropericardial friction with thickened pleura extending above the sixth rib; evidence of effusion." Temperature, morning, 101.6; afternoon, 104.4, rectal.

May 29th, shoulder still painful. Packing was removed from the sinus and a light wick inserted. May 30th, 200,000,000 units of autogenous vaccine were given. He seemed somewhat improved.

May 31st, temperature, morning, 100; afternoon, 103.

June 2d, general condition seemed improved. There was slight discharge from the neck wound. The mastoid wound was clean. Ten minutes after dressing there was a hemorrhage from the sinus. This was examined and found to be a slow bleeding from the anterior portion, easily controlled by light packing.

June 3d, general condition somewhat better; temperature, morning, 99.6; afternoon, 102. Three hundred million units of autogenous vaccine given. June 4th, packing was removed from the mastoid. June 6th, right shoulder joint still sore

and painful. Surgical consultation and aspiration was advised. Eight cubic centimeters of serosanguinous fluid was obtained. No growth on culture. He continued gradually improving for the next eight days, with temperature below 100, rectal. June 13th, he was up in a chair. June 14th, temperature rose to 102 and fluctuated between 101 and 103 for the next three days. Medical examination showed thickened pleura on the left, from base to the sixth rib in axillary line; heart fairly well compensated; white blood count, 16,200.

June 16th, fundi examined by Lieut. Col. de Schweinitz: "Right disc swollen 2.5 D., hemorrhage above disc. Left disc swollen 3.5 D., no hemorrhage. No optic neuritis. Reflexes all negative."

June 17th, spinal puncture performed; fluid clear, normal pressure, cells 2 per centimeter. No growth on culture. Neurologic examination by Major Ney: "Reflexes normal, no paralyses, sensations normal, cranial nerves negative, no evidence of increased intercranial pressure, no focal symptoms."

June 18th, temperature normal. Fundi examined by Lieut. Col. de Schweinitz: "Right disc swollen 3.5 D., no change in hemorrhage. Left disc swollen 3.5 D., temporal edge of disc visible, probably toxic condition."

June 20th, fundi showed no change. Blood pressure, systolic, 126; diastolic, 84. Mastoid wound was clean and neck wound about healed.

June 23d, examination of fundi showed both discs swollen 2 D. Some improvement in hemorrhage in the right. From this time on there was continued improvement. The patient was up and about the ward.

July 4th, examination of fundi showed right outline of disc distinct along entire temporal side, much improved and almost normal, no sign of hemorrhage. Left same as right.

July 8th, vision was tested: right 20/30, left 20/30. The neck wound was healed and the mastoid almost so. The shoulder still showed some limitation of motion and smaller in size than the left. This was put under the care of the Orthopedic Department and gradually improved. The mastoid wound rapidly healed. The neck wound showed a small linear scar, not easily discernible; hearing was 20/20. He was

discharged by the Orthopedic Department as cured, August 24th.

COMMENT.

In this case apparently we had to deal with first a very acute suppurative otitis media, the virulence of the infection being shown by the temperature on admission, amount of pain and early tenderness over the tip of the mastoid. Associated with this was undoubtedly more or less involvement of the mastoid, which was unrecognized at the time. Under appropriate treatment this subsided, and we had apparently a convalescent middle ear and an arrested if not healing mastoiditis. Then we had the advent of acute follicular tonsillitis, which was due to the same or to an added organism, and the streptococcic torch applied to the waiting bonfire in the middle ear and mastoid resulting in acute exacerbation, made manifest after nine days of apparent convalescence.

Progress was rapid and we soon had in four days a manifest mastoiditis presenting a drooping of the superior canal wall, thickened mastoid periostium and the preauricular swelling already spoken of. Operation disclosed extensive destruction and perisinus abscess. The temperature of 103 on May 10th was probably the beginning of invasion of the sinus wall.

Four days after operation, we had the first real manifestation of sinus involvement with a chill and rise in temperature of 104. This probably marked the initial bacterial invasion of the blood stream. Two days later came the first spontaneous hemorrhage from the sinus, due to necrosis of the vessel wall, and two days later we had the second chill, considered by some as the final indication of operative interference. Ligation was then performed, but we already had our septicemia manifested by subsequent septic temperature and the metastatic process in the right shoulder. The attempt to demonstrate, much less remove the thrombosis was unsuccessful, though undoubtedly a parietal thrombosis was present. We were not able to get the blood bacteria free, but had a septicemia, with a metastatic process in the right shoulder joint and probably in the left pleural cavity.

Because of the necrosis of the sinus wall, manifested by sub-

sequent hemorrhage, it was impossible to block off the sinus above and below, to remove a part of the lateral wall and obliterate it by compression. This resulted in a retention of the focus of infection within the vessel. Further necrosis of the wall took place, together with breaking down of the clot, and subsequent hemorrhages ensued. The sinus was not obliterated at that time. Indeed, it is a question as to when the sinus is obliterated backward to the torcular after operation.

Some time ago I operated upon a mastoid which had had a previous mastoid with ligation of the internal jugular and removal of a thrombus from the lateral sinus two years before, and I found the sinus completely obliterated, its location being evidenced only by a fibrous thickening of the dura.

The fundus changes were probably toxic, as Lieut. Col. de Schweinitz pointed out.

The patients' septicemia was limited by the ligation, tardy as it was, and his resistance enabled him to weather the infection.

This case seems to bear out the generally accepted opinion that thrombosis of the lateral sinus is due to necrosis of intima of the vessel wall. This may be manifested by hemorrhage from the sinus. Therefore, it would seem decidedly indicated in a case showing this sign to operate immediately rather than waiting for the classical two chills and septic rise of temperature.