CASE REPORT

INTRADURAL INFECTION FOLLOWING RESECTION OF POST-TRAUMATIC MUCOCELE IN THE FRONTAL PARanasal SINUS

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Mucocele formation and infection following fractures through the frontal paranasal sinuses frequently do not result in surgical intervention until many years after the initial trauma. It is to be emphasized that a dural laceration, the result of the same initial trauma, may still be of the greatest significance.

The following report is on a patient with mucocele formation and infection, operated on 22 years following trauma. The case is unusual because the sequence of events during its management clearly illustrates the importance of ascertaining the state of the dura mater.

CASE REPORT

At the age of 10 years (in January, 1933) a 32-year-old female was struck by an automobile and suffered a compound comminuted depressed fracture of the skull in the right frontal region, extending through the frontal sinus. There was bleeding from the nose, mouth, and ears. The patient was unconscious for 3 weeks and then recovered rapidly. Thereafter, there was a frequent complaint of headaches, mostly frontal, and of persistent puffiness of the right upper eyelid. In addition, there was gradually increasing prominence over the medial aspect of the right supraorbital ridge associated with repeated episodes of swelling, warmth, and redness.

The patient was admitted to the Neurological Institute of New York in 1941 because of headache. A pneumoencephalogram was obtained and was reported as normal.

The prominence above the right eye progressed, and repeated episodes of infection occurred. Ten days after the most recent episode, on Sept. 9, 1956, the patient was hospitalized on an Ear, Nose and Throat Service.

Examination. At the time of admission there was a slightly tender swelling at the inferior and medial aspect of the right supraorbital ridge. Roentgenograms showed a radiolucent area in the region of the right frontal sinus which extended across the mid-line to deform the left frontal sinus. There was eburnation of bone around this area, with some destruction of bone, and there was evidence of an old fracture medial to the frontal notch. A diagnosis was made of a mucocele in the right frontal sinus associated with infection.

1st Operation. On Oct. 2, 1956 members of the Ear, Nose and Throat Service opened the right frontal sinus through a medial infra-orbital incision and excised a mucocele which had eroded the anterior, posterior and medial orbital walls of the sinus. It was stated that the mucocele sac “was found to be adherent to the dura mater—and this attached portion was left behind.” The mucosa was stripped from all walls of the sinus. A 5 mm. polyethylene tube was left as a drain extending from the floor of the frontal sinus down through the middle meatus into the nose.

Course. On the first postoperative day (Oct. 3, 1956) the neck was described as slightly stiff. Intensive antibiotic therapy was begun, using penicillin, Achromycin and sulfadiazine, but nevertheless the temperature varied from 101° to 102°F.
INFECTION FOLLOWING RESECTION OF MUCOCELE

On the 12th postoperative day, the temperature spiked to 104°F. The neck was rigid, and the patient became moderately obtunded, complaining of a considerable increase in headache. Lumbar puncture showed a pressure of 190 mm of cerebrospinal fluid, which contained 175 white blood cells per c.mm., of which 38 per cent were lymphocytes; sugar content was 75 mg per 100 cc. An electroencephalogram was grossly abnormal showing a right frontotemporal focus. Roentgenograms of the skull showed intracranial gas in the subdural space on the right, anteriorly. Antibiotic therapy was changed to Chloromycetin, streptomycin, and sulfadiazine, and there followed a decrease in temperature, but the patient continued to complain of severe headache and to be obtunded. A diagnosis of epidural and probable subdural suppuration was made.

2nd Operation. On Oct. 16, 1956, 14 days after the first operation, the patient was transferred to the neurosurgical service of the Neurological Institute of New York, and a right frontal craniectomy was performed. The right frontal sinus was found to be filled with acute and chronic inflammatory tissue continuous posteriorly with very old granulation and scar tissue extending through a large dural defect to become adherent to densely gliotic brain tissue. The granulation tissue, together with adjacent densely scarred brain tissue containing fragments of old porous bone, was excised, leaving a defect in the frontal pole approximately 4 cm. across. During the procedure there was an escape of gas and dark, greenish fluid from the subdural space over the right frontal lobe.

The polyethylene-tube drain extending from the floor of the frontal sinus into the nose was left in place. Gelfoam soaked in a bacitracin-neomycin solution was placed in the frontal sinus covering the area of the drain. A pedicled graft of thick frontal pericranial tissue containing frontalis muscle was fixed over the area of the frontal sinus and sutured tightly to the margins of the overlying dural defect. At the termination of this procedure the area of the frontal sinus had been completely walled off from the intradural space, and also from the epidural and subgaleal spaces. The area of the frontal sinus could drain to the exterior only by way of the polyethylene tube, used to reestablish a nasofrontal duct. During the closure the wound was irrigated with a bacitracin-neomycin solution. The epidural space was drained externally and during the next 4 days was irrigated intermittently with the bacitracin-neomycin solution.

Pathological Studies. Culture of tissue removed at operation grew hemolytic Staphylococcus aureus (coagulase positive). The neuropathological diagnoses of the tissue removed at operation made by Dr. Abner Wolf were: 1) Acute and chronic inflammation of mucous membrane of paranasal sinus. 2) Osteomyelitis. 3) Granulation tissue, epidural and subdural. 4) Acute and chronic leptomenigitis. 5) Encephalitis, focal.

Course. Antibiotic therapy with Chloromycetin, streptomycin and sulfadiazine was continued. Within 24 hours the temperature fell to below 100°F, and by the 8th day was normal. On the 4th postoperative day all drains were removed, including the polyethylene tube extending from the floor of the sinus into the nose. The latter drain had been in place since the first operation, 18 days before.

The patient was discharged from the hospital on Oct. 31, 1956, 15 days after the last operation, to return home. She resumed her normal activities, continuing free of all complaints, except cosmetic, relating to the result of the loss of frontal bone, including a portion of the supraorbital ridge.

A cranioplasty was planned and the patient was readmitted to the Neurological Institute of New York on July 11, 1957 and discharged on July 26, 1957. It is of interest that an electroencephalogram obtained at this time was found to show no evidence of abnormality. In collaboration with Dr. George F. Crikelair of the Plastic Surgical Service at the Columbia-Presbyterian Medical Center the defect of the skull was repaired using an autogenous graft from the right iliac crest, with an excellent result.

DISCUSSION

Intracranial complications, including infection, cerebrospinal fluid fistula, and pneumocephalus, have been reported in association with mucoceles of the paranasal