CASE REPORTS AND TECHNICAL NOTES

CEREBROSPINAL RHINORRHEA BY WAY OF THE EUSTACHIAN TUBE

REPORT OF CASES WITH THE DURAL DEFECT IN THE MIDDLE OR POSTERIOR FOSSA

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It is now well known that the leakage of cerebrospinal fluid from the nose results most always from a defect or tear in the dura mater associated with a fracture or hiatus in the anterior fossa of the skull. Most often the bony gap is in the posterior wall of a frontal sinus, the roof of an ethmoidal sinus or the cribiform plate.1,4,5 Occasionally the osseous defect is in the roof of the sphenoidal sinus. However, it is not generally known that the leakage of cerebrospinal fluid from the nose may really be due to a dural defect in the middle or posterior fossa. Such a tear in the dura, if associated with a traumatic or surgical fracture of the temporal bone, allows cerebrospinal fluid to enter the middle ear or mastoid cells and thence to drain from the eustachian tube into the nasal cavity. This fact is illustrated by four cases in the present paper.

Case 1. The patient was a young man who suffered a blunt injury of the head as a result of a traffic accident on Nov. 4, 1944. There was immediate bleeding from the right ear. From the time of his injury he also experienced the discharge of clear colorless fluid from the nose and persistent weakness of the right side of the face. On Nov. 28, 1944 there developed meningitis caused by pneumococcus type 22. The patient recovered promptly after administration of sulfadiazine and intrathecal penicillin for 8 days. However, on Dec. 8, 1944 meningitis developed again and was then found to be due to a hemolytic staphylococcus aureus and to a nonhemolytic streptococcus.

On Dec. 12, 1944, when the patient came under the author's care, examination revealed a drowsy young man with normal temperature and pulse rate. He had a peripheral type of facial palsy on the right side, deafness of the right ear, a blood clot in the right external auditory canal and slight blurring of the nasal borders of the optic disks with some engorgement of the retinal veins. The rest of the neurological examination was negative. The patient was carefully observed for a few days and it was seen that the cerebrospinal fluid sometimes drained from the right nostril and sometimes from the left, and a greater flow seemed to result when he lay on his left side.

On Dec. 17, 1944 the author performed a bifrontal craniotomy with ligation of the superior sagittal sinus and splitting of the falk. This permitted a thorough intradural exploration of both right and left anterior fossae of the skull including the region of the cribiform plate and the roof of the sphenoidal sinus. No evidence of fracture or dural defect was found. However, the cribiform plate was deep, especially on the right side, and theoretically there might have been a fracture in its depth. Therefore, fibrin foam, soaked in thrombin, was placed over the cribiform plate and covered with a free peristeal graft. The patient tolerated the procedure well and improved slowly but uneventfully. For 2 weeks after operation he continued to drain cerebrospinal fluid from his nose. The flow of fluid ceased at that time and the patient recovered.

Case 2. This is a patient of Mr. Norman Dott6 who has given permission for its publication and who wrote on July 15, 1946:

"My case of cerebrospinal rhinorrhea from eustachian tube was in a child, a girl about 8 or 10. She was at the Children's Hospital in Edinburgh at least 15 years ago. She had a frac.
ture of the base of the skull which ran through the left petrous and down to the foramen magnum. It was missed in x-rays. She was unconscious or semi-conscious. There was no external discharge from the ear and damage in this neighborhood was not appreciated. There was continuous cerebrospinal rhinorrhea from the left nostril. This certainly occurred as she lay on her left side. There was no fluid discharge from the right nostril at any time. It was said that rhinorrhea continued from the left nostril even when she lay on the right side. She recovered consciousness, the discharge continuing. We explored the left anterior fossa and found no place of leakage. The rhinorrhea continued a few days. She then developed meningitis from which she died. There was a history of previous mastoiditis. Post-mortem showed some chronic infection of the mastoid cells and an infection spreading along the fracture and intracranially. The dura had been torn over the posterior surface of the petrous. The fluid had been escaping into the middle ear and thence along the eustachian tube into the pharynx and was appearing at the left nostril."

Case 3. This patient, reported by Schroeder in 1944, had a cyst-like tumor in the cerebellopontine angle (apparently an acoustic nerve tumor). It was removed through an opening made in the skull behind the right ear. The patient did well following the operation except that a clear salty fluid dripped from his nose when he leaned forward. Otherwise, the fluid ran into his pharynx. The patient subsequently developed meningitis which responded to sulfadiazine and was followed by spontaneous cessation of the drainage of the clear fluid into the patient’s nose or throat.

Case 4. Dandy also reported a case of cerebrospinal rhinorrhea which developed following removal of a tumor of the acoustic nerve. The healed surgical wound was re-opened and the hollow in the petrous bone was painstakingly waxed but without any effect on the drainage of cerebrospinal fluid. The ear drum was found to be bulging with fluid. "Methylthionine chloride (methylene blue) was injected into it. A blue-stained fistula was located in the posterior wall of the middle ear. This cartilaginous opening was sutured and the adjacent mastoid waxed. The wound broke down with infection, and the sutures were extruded. . . . The rhinorrhea persisted. Several weeks later, on April 6, 1938, he had another attack of meningitis (Staph. aureus) and died."

SUMMARY

This is a report of four cases of cerebrospinal rhinorrhea in which the eustachian tube acted as an aqueduct for the fluid. In the first two cases, previously unpublished, the source of the fluid was a dural defect in the middle or posterior fossa associated with a traumatic fracture of the petrous bone. Negative exploration of the anterior fossa of the skull had been performed on both patients. Also reported are two cases from the literature in which cerebrospinal rhinorrhea resulted after operation for an acoustic nerve tumor. In order to avoid misdirected exploration of the anterior fossa of the skull it is important to recognize these rare cases in which cerebrospinal fluid issues from the nose and in which the dural defect lies in the middle or posterior fossa.

REFERENCES
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4. Ecker, A. D. Pedicled pericranial grafts in the anterior fossa of the skull. (To be published in Arch. Otolaryng.)