Pseudo-Froin’s syndrome, xanthochromia with high protein level of cerebrospinal fluid

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Froin’s syndrome is characterized by marked cerebrospinal fluid (CSF) xanthochromia (yellow discoloration of the CSF) and hypercoagulability due to increased protein content. The cause of the high protein content of the spinal fluid is meningeal irritation and inflammation. Pseudo-Froin’s syndrome has been described as stagnation of the CSF distal to a spinal block due to spinal disc bulging or tumors [1].

A 54-year-old man with paraplegia was admitted to the urology department of our institution for follow-up of a bladder wall malignancy. The patient had suffered from paraplegia for 20 years because of a thoracic spine burst fracture (T5-7) and dislocation. He had undergone operative correction to maintain the curvature of the spine. The patient was currently scheduled for a urinary bladder wall biopsy. At the time of his admission, the patient’s vital signs were stable and all laboratory findings including pulmonary function tests and arterial blood gas analysis were within normal limits. Magnetic resonance imaging and computed tomography scans of the brain/spine showed no specific abnormal findings except thoracic spine destruction and dislocation. No motor or sensory abnormalities were found in the upper chest or upper extremities. Because the patient wished to maintain alertness during the operation, it was planned to perform the surgery under spinal anesthesia.

The first time spinal anesthesia was performed, the CSF flow was very scanty and sticky, and the color was dark yellow. “Give” was felt, and the CSF color was judged to be due to a traumatic tap. Spinal drug administration was done after CSF confirmation by aspiration. The patient’s mental status and vital signs, especially respiration, were stable throughout the operation following the successful spinal anesthesia. No specific problems such as headache, reflex tachycardia, or sweating were observed in the perioperative period. At the second spinal anesthesia for bladder-cancer follow-up surgery, lumbar spinal pressure was measured. The CSF was observed to not drain freely due to low spinal pressure, below 1 cmH2O, and thick density. The CSF was also observed to be an extraordinarily dark yellow color and very sticky, and CSF was collected by aspiration (Fig. 1). Cell count, cytology, electrophoresis, and culture of the CSF were

Fig. 1. The picture shows yellow discoloration of the cerebrospinal fluid (xanthochromia of the CSF). Picture is taken immediately after the CSF collection.
performed. The CSF studies were performed within 30 min after collection of the fluid. The patient's CSF showed high protein (3,114.5 mg/dl), normal glucose (46 mg/dl) and CSF/blood glucose ratio (0.58), elevated T-cholesterol (31 mg/dl), and triglycerides (5 mg/dl). Cell counts were white blood cells (WBC) 50 cells/μl (neutrophil 45%, lymphocyte 55%) and no red blood cells. Cytology showed atypical cells or malignant unknown cells, but no malignant cells or pathologic organisms were found in culture.

In Froin's syndrome, blockage of the spinal canal and stagnation of the CSF develops due to an obstructing inflammatory or neoplastic lesion. High CSF protein levels are caused by exudation or transudation from a tumor itself or hematogenous factors, in loculated areas of the subarachnoid space, sequestered from cerebrospinal fluid circulation. In Pseudo-Froin's syndrome, high protein levels are also observed in the CSF, and patients complain of back pain and sciatica. Interruption of the spinal canal and stagnation of the CSF by a neoplastic mass or herniated disc contribute to the sequestered CSF circulation and spinal canal and stagnation of the CSF by a neoplastic mass or herniated disc. In Froin's syndrome, high protein levels are caused by exudation or transudation from a tumor itself or hematogenous factors, in loculated areas of the subarachnoid space, sequestered from cerebrospinal fluid circulation. In Pseudo-Froin's syndrome, high protein levels are also observed in the CSF, and patients complain of back pain and sciatica. Interruption of the spinal canal and stagnation of the CSF by a neoplastic mass or herniated disc contribute to the sequestered CSF circulation and spinal canal and stagnation of the CSF by a neoplastic mass or herniated disc.

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