Radionuclide Cisternography in Spontaneous Intracranial Hypotension CSF leakage: A Case Report

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Orthostatic headaches may be caused from spontaneous cerebrospinal fluid (CSF) leakage. The sites of spinal CSF leaks may be single or multiple. We presented a case of suspected spontaneous intracranial hypotension received 99mTc-DTPA radionuclide cisternography for further evaluation. The image findings are positive and provide an important clue to treat the patient. Radioisotope cisternography is a useful tool to diagnose and localize cerebrospinal fluid leakage in a case of intracranial hypotension syndrome.

Key words: spontaneous intracranial hypotension (SIH), cerebrospinal fluid leakage, radionuclide cisternography


Introduction

First described by Schaltenbrand in 1938 as “acute aliquorhrea”, spontaneous intracranial hypotension (SIH) is an increasingly recognized cause of acute headache. SIH can result from a persistent cerebrospinal fluid (CSF) leak. There are several reasons of CSF leakage including blunt or penetrating trauma, postoperative sequel with leakage through a dural tear or incision, lumbar puncture, meningeal puncture during epidural anesthesia, spontaneous leakage from 1 or more spinal nerve root sleeves, particularly in the thoracic and lumbar areas and Valsalva maneuver during excessive weight lifting.

SIH is a rare syndrome and sometimes is difficult in differential diagnosis by clinical manifestations [1]. Detection of the CSF leakage may help the diagnosis of a SIH. Nuclear medicine imaging has been used to diagnose and localize CSF leakage, most in cases with persistent rhinorrhea or otorrhea after car accident and occasionally in cases with CSF leakage at other places, for decades [2-6]. In this study, we presented a case of SIH with CSF leakage at T-spine level. Radionuclide cisternography clearly demonstrated the site of leakage.

Case Report

A 36-year-old female suddenly developed headache and vomiting for one week before she visited our hospital. She had mild headache while lying, but the headache became worse while sitting and standing. No history of trauma had been recorded. A lumbar puncture was performed and showed an opening CSF pressure of 10 cm H2O. SIH was impressed and CSF leakage was suspected. She was referred to our department for 99mTc-DTPA radionuclide cisternography.

After receiving an explanation of the procedure and giving written consent to undergo it, she received an approximate 5 mCi of 99mTc-diethylenetriamine-pentaacetic acid (DTPA) intrathecally via lumbar puncture. Posterior views of the brain and the whole spine were performed at 1 h, 2 h, 4 h and 6 h post injection. The radionuclide cisternography showed a CSF leakage at the upper T-spines level throughout the study (Figure 1) and an accumulation of isotope was also noted in the kidneys on the 4-h and 6-h images (Figure 2).