Interesting images

Nasal cerebrospinal fluid leakage diagnosed by cisternoscintigraphy with intestinal activity confirmed by SPECT-CT

Fuga de líquido cerebroespinal diagnosticada por cisternogammagrafía con actividad intestinal confirmada por SPECT/TAC


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A R T I C L E  I N F O

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We report the case of a 40-year-old woman with intermittent rhinorrhea during 1 year, without any other symptoms. Physical examination showed isolated rhinorrhea. Under the suspicion of cerebrospinal fluid (CSF) fistula, magnetic resonance imaging (MRI) was performed (Fig. 1A), with inconclusive findings of fistula in the right posterior region of the cribriform plate. Confirmation with other diagnostic methods was suggested.

The patient was referred to the Nuclear Medicine Department for a radionuclide cisternoscintigraphy with intrathecal injection of $^{111}$In-DTPA. Extracerebral activity was observed in the nasal region 4h after the injection, and caudal to the right fronto-temporal convexity, 24h after injection (Fig. 1B). Furthermore, radionuclide cisternography showed indirect signs of CSF leakage: significant count rate was detected in both nasal pelves, mainly at the right side (222,000 counts vs. 1720), and digestive activity was detected in the colon secondary to swallowing of CSF, both suggestive of CSF leakage (Fig. 2A).

SPECT-CT (low-dose, non-contrast enhanced CT) performed 3 and 24h after the intrathecal injection confirmed the presence of extramedullary activity in the gastrointestinal tract, suggesting the ingestion of contaminated nasal secretions (Fig. 2B).

Cerebrospinal fistulas are caused by a disruption of arachnoid and dura, related to a bone defect, and causes rhinoliquorrhea or otoliquorrhea, depending on the location. The flow of CSF to the nasal cavity may occur through the frontal sinus, the cribriform plate or the sphenoid sinus. Most cases are secondary to trauma, although some of them are spontaneous, as our case which had no history of trauma. The cause of spontaneous liquorrhea is not well known. Some authors suggest a genetic defect, while others support the presence of small encephaloceles eroding bone or olfactory nerves atrophy at the cribriform plates. This type of fistulas are potentially severe due to the communication of the intracranial space with the nasal fossae, and consequent risk of ascending infection causing meningitis. For this reason, fistulas that do not resolve spontaneously within a short period of time should be treated.

Cisternoscintigraphy with $^{111}$In-DTPA is very useful to identify small, intermittent or doubtful leaks. In our reported case, SPECT-CT was able to confirm the presence of CSF labeled with $^{111}$In-DTPA in the gastrointestinal tract, and helped us to reach the definitive diagnosis. 

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Fig. 1. (A) Coronal (left) and sagittal (right) MRI with gadolinium showed hyperintense linear image (arrow) with the same signal intensity as CSF, appearing to communicate with the extraaxial space at the right-posterior region of the skull base. Caudally it extends to nasal fossae continuing obliquely to posterior direction. It is located at 1 cm of the anterior margin of the sella. (B) Lateral planar images at 4 and 24 h showing extracranial activity in nasal region (arrow) and caudal to right fronto-temporal convexity (arrowhead).
Fig. 2. (A) Anterior and posterior abdominal planar images at 2, 4 and 24 h of intrathecal injection of $^{111}$In-DTPA. Radiotracer activity is visualized in the abdomen with a changing pattern. (B) Axial images of SPECT-CT at 3 and 24 h showed activity located in the stomach (arrow) and ascending colon (arrowhead).

Conflicts of interest

The authors have no conflicts of interest to declare.

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References