CASO CLÍNICO/CASE REPORT

Refractory Post-Dural Puncture Headache: The Utility of Computed Tomography Myelography

Cefaleia Pós-Punção Dural Refratária: Utilidade da Mielografia por Tomografia Computorizada

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Abstract

We present the case of a 22-year-old female patient who developed persistent holocranial headaches and nausea following spinal anaesthesia for a eutocic delivery. During the following three months, conservative measures and multiple epidural blood patches were tried unsuccessfully. In addition, various head and spinal magnetic resonance imaging (MRI) scans were performed with no evidence of radiological abnormalities. Detection of a CSF fistula was only possible following a computed tomography (CT) myelography, and after a targeted image-guided epidural blood patch, a complete clinical and radiological resolution was finally observed. CT myelography is still a useful imaging modality in selected cases for the accurate assessment of cerebrospinal fluid (CSF) fistulae. It may be a crucial exam in suggestive cases in which no significant radiological abnormalities can be found in spinal MRI scans and MR myelography.

Resumo

Apresentamos o caso de uma doente de 22 anos que desenvolveu cefaleia holocraniana persistente e náuseas após raquianestesia no contexto de parto eutócico. Durante três meses foram implementadas medidas conservadoras e tentados múltiplos *patches* de sangue epidural, todos sem sucesso. Adicionalmente, foram realizadas várias ressonâncias magnéticas (RM) crânio-encefálicas e medulares que não evidenciaram quaisquer alterações. O diagnóstico de uma fístula de líquido cefalorraquidiano (LCR) só foi possível na sequência de uma mielografia por tomografia computorizada (mieloTC). Após um *patch* de sangue epidural dirigido por imagem foi por fim obtida resolução clínica e imagiológica da fístula. A mieloTC é ainda um exame de imagem útil em casos selecionados para deteção precisa das fístulas de LCR. Pode ser um exame crucial em casos sugestivos nos quais nenhuma alteração imagiológica é detetada em RM medular ou em mielografia por RM.

Introduction

Cerebrospinal fluid (CSF) fistulae are rare but possible complications of invasive procedures of the central nervous system (CNS), such as spinal anaesthesia.[1] They can cause CSF hypotension, which in turn has many clinical manifestations, with orthostatic headache being the most common.[2,3] When a CSF leak is suspected, head or spinal magnetic resonance imaging (MRI) or magnetic resonance (MR) myelography are the imaging modalities of choice.[2-5] However, radioisotope cisternography and especially computed tomography (CT) myelography still play a key role in the diagnosis of fast and slow-flow leaks.[2-4] Apart from small and slow leaks, which may be better detected through MR myelography with intrathecal injection of gadolinium,[3,4] CT myelography is still the most reliable imaging method to identify the exact site of a CSF leak.[3] Treatment options include bed rest, fluid therapy, caffeine, theophylline, gabapentin, corticosteroids, analgesics, and nonsteroidal anti-inflammatory drugs.[2-4] Rarely, more invasive therapeutic options, such as epidural blood patches (blind or targeted image-guided) or surgical correction of the fistula may also be required when no improvement is obtained after conservative measures.[2-4]

Case Report

A pregnant 22-year-old woman with no relevant known medical history was admitted to a hospital due to ongoing labour. She underwent eutocic delivery under spinal anaesthesia, which was performed after multiple attempts due to technical difficulties through a median approach at the L3-L4 level. A few hours later she developed complaints of severe holocranial headache and nausea, which worsened in the upright position. A post-puncture headache was considered and conservative treatment with bed rest, fluid therapy, paracetamol, metamizole, and high-dose caffeine was implemented. Nevertheless, no response was observed and the patient remained highly symptomatic.

Head and spinal MRI were performed the following day, revealing diffuse pachymeningeal enhancement suggestive of intracranial hypotension. A first blind epidural 18 mL blood patch was performed through a median approach at the L2-L3 level, with slight improvement, and the patient was discharged the following day with pain-relief medication. She returned to the hospital three weeks later due to symptom relapse and conservative treatment was once again applied due to lack of radiological evidence of CSF fistulae in a repeat MRI scan. Despite this, she remained highly symptomatic for the following two weeks, and a second blind epidural 15 mL blood patch at the L3-L4 level was attempted but was again ineffective. Two MR myelographies and a spinal MRI were performed with an interval of a few weeks, but none revealed signs of a CSF fistula.

For three months and after a total of three blind lumbar epidural blood patches and many conservative measures, the patient was never completely asymptomatic, and radiological evidence of a CSF fistula was never found.

She was then admitted to our centre, where a CT myelography was performed, revealing the existence of a CSF fistula at the L2-L3 level (**Fig. 1**). An epidural 20 mL targeted image-guided blood patch was then performed at this level through a left paramedian approach (following the fistula's trajectory). After the procedure, a slowly progressive symptomatic recovery was ob-

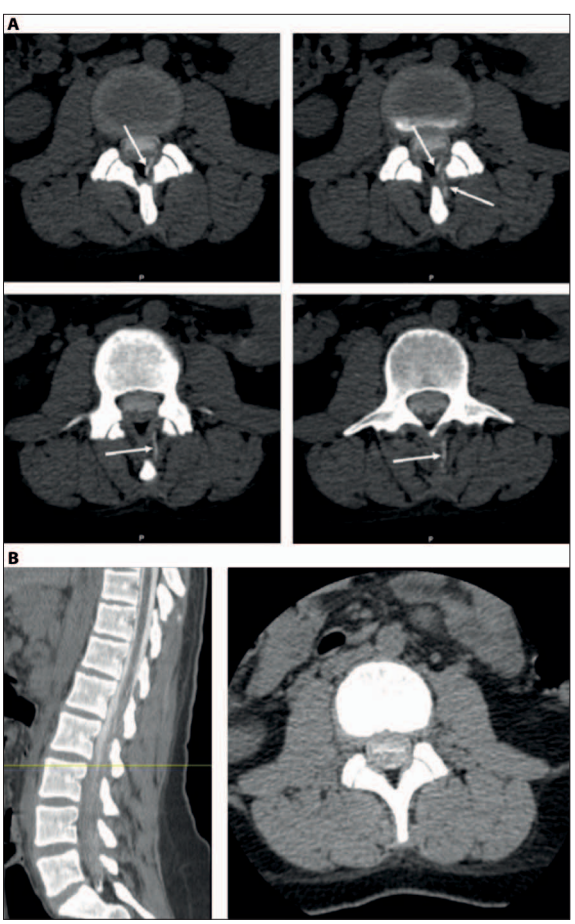

Figure 1. A: first CT myelography; transverse section at the L2-L3 level showing contrast leak from the subarachnoid space to the left posterolateral epidural space, as well as a small posterior left paramedian contrast trajectory (white arrows), compatible with a CSF fistula. B: Control CT myelography after targeted image-guided epidural blood patch; sagittal (left) and transverse (right) section at the L2-L3 level (yellow line) showing no signs of a CSF fistula.

served and a control CT myelography performed one month later revealed complete resolution of the previously documented CSF fistula.

Nine months after this last procedure, the patient remained asymptomatic, and a clinical relapse was never reported.

Discussion

This case serves to illustrate the challenges associated with the identification of CSF fistulae. This was a particularly difficult case since the previously performed spinal MRI or MR myelographies revealed no evidence of a CSF leak, but the CT myelography allowed us to identify the CSF fistula and perform a successful targeted epidural blood patch. This supports the useful role of CT myelography in the assessment of CSF fistulae, even though it is no longer considered a first-choice imaging modality.

Although the success rate of epidural blood patches is less impressive in spontaneous intracranial hypotension compared to post-dural puncture headaches[2] (with a first patch providing symptom relief in the majority of patients and a second one in almost all the cases[3]), this report highlights that it not always the case in clinical practice. This case also supports the importance of accurately assessing the CSF fistula's location, mainly when the suspicion is high and the symptoms are refractory to conservative approaches, to perform a targeted image-guided epidural blood patch that can eventually lead to a definitive resolution of the fistula and a complete clinical recovery. ■

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