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Successful Use of An Epidural Blood Patch Six Years After Post-Dural Puncture Headache

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Abstract

Post dural puncture headache is common in obstetric side effects; it's usually managed in the post-partum stage. We report for the first time a case about a chronic headache after lumbar dural puncture persisting for 6 years after spinal anesthesia for cesarean section, for 37-year-old patient. The blood patch hasn't been performed in the post-partum stage. The patient suffered from headache for six years until we did a blood patch.
Epidural blood patch is effective for treating chronic headache after dural puncture in the case of a six-year duration.

Keywords: *Post dural puncture headache, Spinal anesthesia, Epidural blood patch, low cerebro-spinal fluid pressure syndrome.*

Introduction

Post-dural puncture headache (PDPH) is a common complication of interventional neuraxial procedures in obstetrical practice [1], but it is uncommon in young children and adults older than 60 years old.

We describe a case of chronic orthostatic headache persisting for six years after spinal anaesthesia for a caesarean section. We performed the placement of an epidural blood patch and achieved complete resolution of pain. This paper discusses the consequences of a lack of early management of PDPH.

Case report

We report a 37-year-old Moroccan patient who had no personal or family history of headache. She had a healthy lifestyle, and this pregnancy was desired.

In terms of her obstetrical history, we noted a planned caesarean section under general anaesthesia in 2009; a second caesarean section was performed in 2011 with spinal anaesthesia without any complications. In 2012, she also underwent a third planned caesarean procedure with spinal anaesthesia. Anaesthesia assessment before this caesarean section showed a normal physical exam, blood pressure of 127/67 mm Hg, and heart rate of 85 beats per minute, and her back was normal without deviation of the spine. Her body mass index was 25 kg/m^2, and the patient was classified with an ASA (American society of anesthesiologist) status of 1 and a Mallampati score of 2.

The caesarean section was performed under spinal anaesthesia in a sitting position, and the second puncture attempt was successful at the L3-L4 level with a 26G Quincke needle. Hyperbaric bupivacaine (12,5 mg) with 100 γ morphine chlorhydrate was used.

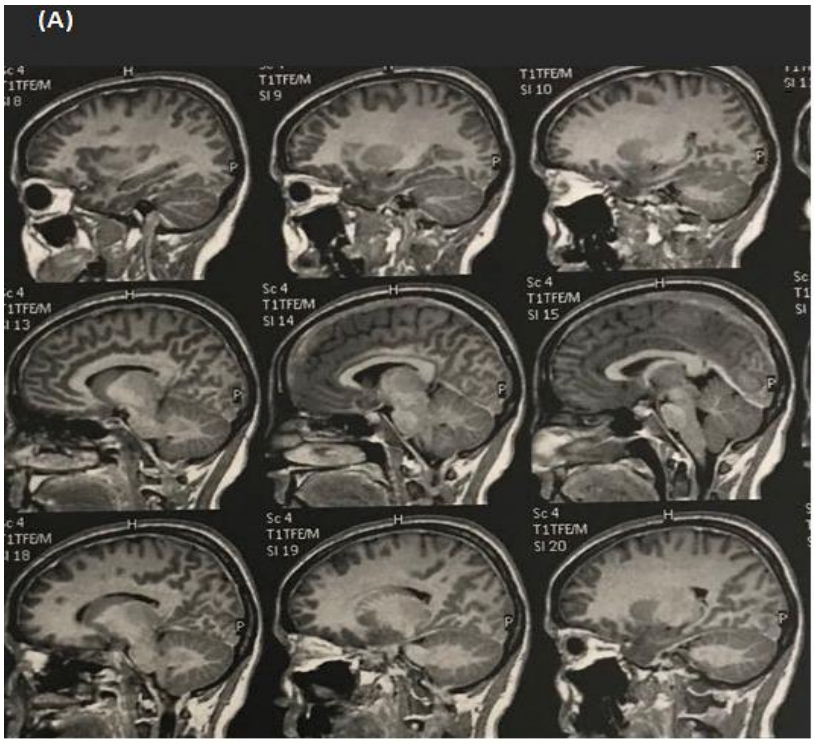
One day later, a severe postural headache appeared when the patient was moved from a supine position to an upright position with radiating pain to the neck and shoulders and other associated features, including blurred vision and dizziness. Her physical examination was normal. There was neither fever nor a stiff neck.

The anaesthesiologist suspected a post-dural puncture headache and prescribed conservative measures such as rest, fluids, caffeine and aminoacetophenone. He underestimated the state of the patient. This patient left the hospital, although her headache was not relieved.
The patient returned for a check-up. The gynaecologist sent her to the anaesthesiologist who ensured her that she would feel better with symptomatic treatment, but there was no improvement in her case. Consequently, she consulted other clinicians.

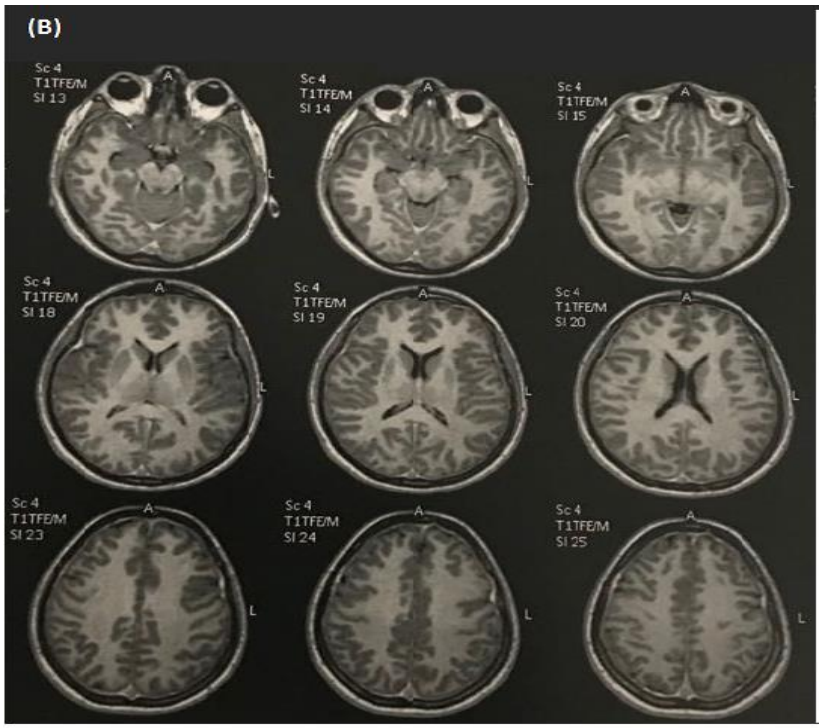
First, she consulted a neurologist in May 2012 who suspected depression and prescribed her antidepressants, but her headache persisted. Then, he asked her to undergo a head CT scan, and maxillary sinusitis was shown, so she consulted an otolaryngologist. This study managed the sinusitis with medicine alone; the management included 6 weeks of antibiotics, nasal steroids, and nasal saline

irrigation. However, the patient did not respond to medical therapy. In May 2013, the patient was re-admitted to the hospital for surgical treatment due to sinusitis, and her stay in the hospital lasted for 10 days. The patient noticed that her state was not better because her headache did not stop, so she visited another neurologist. Then, she went to see a neurosurgeon who prescribed her different medicines, including Tanakan (contains Ginkgo biloba as an active ingredient). In 2015, she was given amitriptyline and Tanakan but with no improvement.

Magnetic resonance imaging (MRI) of the brain was performed on September 23, 2017 and demonstrated diffuse patchy meningeal enhancement with administration of gadolinium, which proved low-pressure headache (figure 1-2). The neurosurgeon did not give any importance to these results.

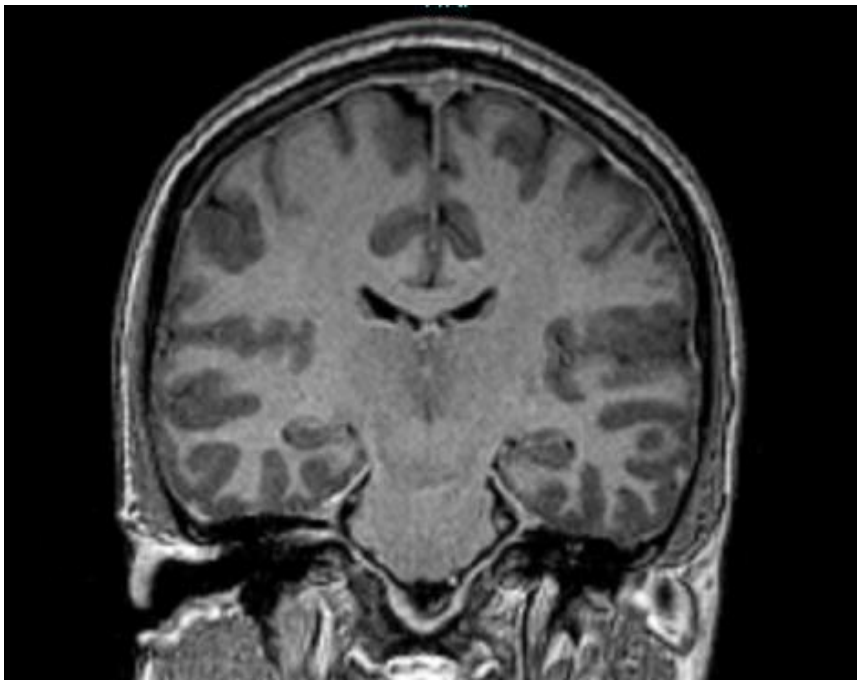


A: Brain MRI, sagittal views.

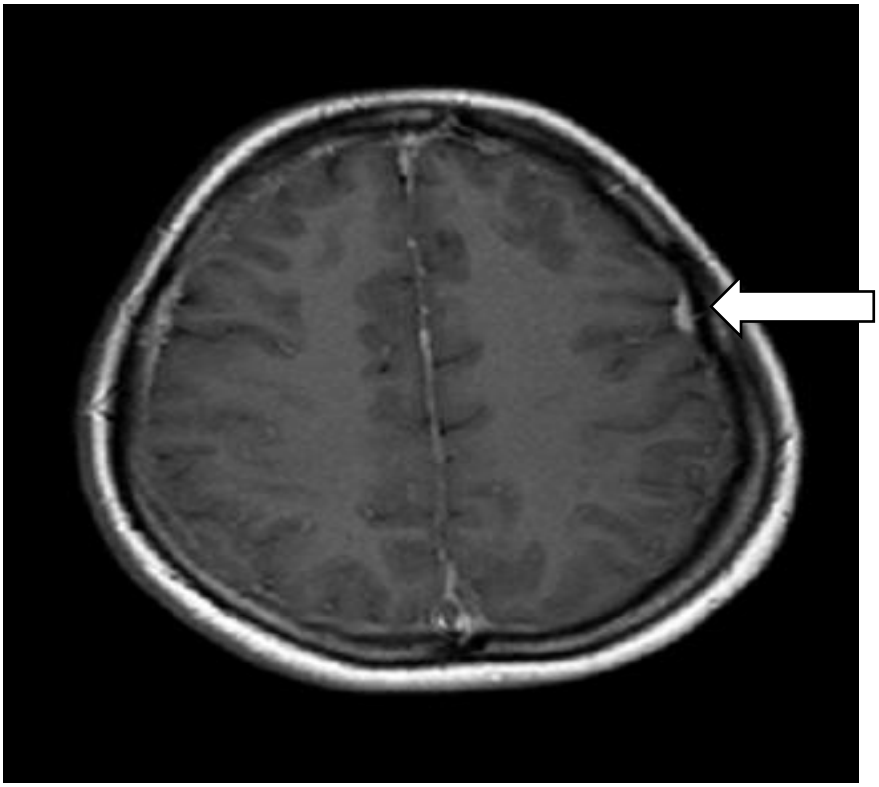


B: Brain MRI, Axial views

Figure 1: (A,B): Normal MRI before gadolinium.



A: Brain MRI, coronal view.



B: Brain MRI, Axial view

Figure 2: (A, B) Pachymeningeal enhancement on post-gadolinium magnetic resonance imaging.

In March 2018, she finally saw another neurologist who suspected a chronic post-dural puncture headache, and he performed a new brain MRI where they noticed the same result as the one done in September 2017. The patient was sent to our hospital to undergo placement of a blood patch.

The general and neurological examinations were normal. She seemed exhausted with a loss of confidence, and her blood test (C-reactive protein, complete cell count, prothrombin time, partial thromboplastin time, INR, electrolytes) was normal. After having explained to her the suggested technique, she accepted a blood patch that was performed on March 17, 2018, in a sitting position; 25 mL of autologous blood was extracted under a strict aseptic technique. After 24 h of rest, she stopped having headaches in orthostatism. Three weeks after discharge, she was observed at the ambulatory care unit showing neither orthostatic headache nor back pain.

Discussion and conclusions

Post-dural puncture headache is a frequent complication of dural puncture, whether performed for diagnostic purposes or accidentally as a complication of anaesthesia [2-3].

Post-dural puncture headache following trauma to the dural membrane during neuraxial anaesthesia occurs in 0.13–6.5% of pregnant patients [4]. The onset of this complication can be quite variable, ranging from < 1% to 86% [5-6], with an overall incidence approaching 8% [7-8]. A large needle gauge, younger patients, women with a low body mass index [9] (especially pregnant women) and traumatic needle types are all associated with a higher incidence of PDPH. The higher rate of PDPH in pregnant women may be due to a decline in CSF density and an increase in intra-abdominal pressure; these factors may induce CSF leakage.

Needle gauge is the most important predisposing factor for PDPH; a smaller calibre needle reduces the incidence of PDPH. Furthermore, certain needle designs have been shown to place patients at higher risk of developing PDPH. The use of pencil-point or "atraumatic" needle types (such as Whitacre and Sprotte) reduces the incidence of PDPH compared to cutting or "traumatic" needle types (such as Quinke).

In a recent study, the authors demonstrated that risk factors for post-dural puncture headache following injury of the dural membrane included patient-related factors such as migraine, obstetric and perinatal pathology; individual staff characteristics and performance-related factors such as multiple attempts and level of training <3 years; and team-related factors such as a nurse anaesthetist not present during the procedure [4].

In its 3rd edition, the International Headache Society defined PDPH as a bilateral headache that develops up to seven days after lumbar puncture and disappears up to 14 days after dural puncture [1-10].

The exact mechanism responsible for the development of PDPH is uncertain, but several theories have been proposed. First, a reduction in CSF pressure can cause traction of painful structures when the patient is in the sitting or orthostatic position. Second, a loss of CSF can cause compensatory venodilation to intracranial hypotension, which can maintain or cause headache [11].

It is known that the proliferation of fibroblasts begins after approximately 48 hours, and it continues for seven days after perforation of the dura mater, facilitating the formation of collagen, which forms a permanent seal, thus closing the orifice. If the healing process does not occur, the CSF fistula can become chronic, maintaining pain for a prolonged period of time. This is the pathophysiologic mechanism defended by the majority of authors as being responsible for post-dural puncture headache. In several cases, PDPH can persist for several weeks to months and can be extremely debilitating with associated morbidity [11,12,13].

To our knowledge, we did not find any case of chronic headache after lumbar dural puncture persisting for 6 years after neuraxial anaesthetic procedures in the medical literature [12].

Because dural or lumbar puncture is very common, clinicians interested in headache should be familiar with this entity; therefore, it is important to understand the management and prognosis of this disorder.

The diagnostic criteria require a strong orthostatic headache in the setting of a dural puncture. Loss of CSF, as occurs during accidental arachnoid disruption, plays a central causal role in the manifestations of the symptoms of PDPH. The Trendelenburg position proves the existence of a post-lumbar puncture headache in patients with a history of post-puncture headache [14].

An undiagnosed low CSF pressure syndrome can lead to a chronic daily headache that is completely disabling and unresponsive to typical headache treatment. In our case, the clinical recognition of this entity was a challenge for clinicians. It is important for general clinicians, neurologists, and headache specialists to be familiar with the clinical characteristics, differential diagnosis and treatment of PDPH [1,3,15].

Imaging is used both to confirm the diagnosis of PDPH and to identify or exclude other causes of headache. In low-pressure headache, MRI of the brain may show diffuse patchy meningeal enhancement with administration of gadolinium.

The treatment of choice for PDPH when conservative treatment fails is the placement of an epidural blood patch. For over 50 years, placement of an epidural blood patch has continued to be a safe, reliable, and effective method for treating patients who suffer from moderate to severe PDPH [16,17].

The greatest benefits of blood patch placement in PDPH include the possibility of diagnosis and treatment, and this method has been recommended when other causes of headache have been ruled out [18]. In our case, we decided to treat the patient by performing placement of a blood patch instead of conservative treatment after observing reports in the literature of complete pain resolution in similar cases of chronic pain after spinal anaesthesia, in the absence of central nervous system pathologies that justified the pain, and in patients with a history of spinal anaesthesia for an obstetric procedure. Complications were not observed immediately or even three weeks after treatment.

This case demonstrated that the epidural blood patch is effective for treating chronic headache after dural puncture in the case of a six-year duration.

PDPH is a frequent complication in the obstetric population; anaesthesiologists must recognize severe headaches and perform blood patch placement as soon as possible. Other physicians, such as neurologists and ENTS, need to understand this complication.

List of abbreviations:

- PDPH: Post dural puncture headache
- CSF: Cerebro-spinal fluid

- ASA: American society of anesthesiologists
- MRI: magnetic resonance imaging

Declarations:

Ethics approval and Consent to participate:

Not applicable.

Consent for publication:

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Availability for supporting data:

Not applicable.

Acknowledgements:

Not applicable.

Competing interests:

The authors declare no competing interests.

Authors' contributions:

All authors contributed to all stages of development of the case report.

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