Case Report

Successful Epidural Blood Patch Treatment for Spontaneous Low Cerebrospinal Pressure Headache with Multiple Leakages in Lumbar Spinal Matter

Chesda Udommongkol MD*,
Samart Rajchadara MD**, Ekachai Choedamphai MD***

*Division of Neurology, Department of Medicine,
**Division of Nuclear Medicine, Department of Radiology, Phramongkutklao Hospital, Bangkok, Thailand
***Camillian Hospital, Bangkok, Thailand

The authors reported a 54 year-old Italian woman with headache attributed to spontaneous low cerebrospinal pressure and normal brain magnetic resonance imaging. Lumbar puncture was done and opening pressure was not measurable. ^{99m}Tc radionuclide cysternography was used in diagnosis and demonstrated 3 lumbar leakages and early appearance of bladder activity. Epidural blood patch was performed. This option was safe and successful to treat this kind of headache without relapse of symptoms after 3 years follow-up.

Keywords: *Headache, Radionuclide cysternography, Epidural blood patch*

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An Italian female aged 54 years presented to Camillian Hospital in October 2002 with acute generalized headache for 3 days. Her status was a nun in a church in Ratchburi Province for more than ten years. She had been well earlier before admission except dyslipidemia and taking simvastatin 10 milligrams a day. At the onset, after getting up in the morning she complained of headache which started at the occipital region propagating to the bifrontal and bitemporal areas and persisted through the head. The headache continued and reached the maximal pain at noon and persisted for 3 days prior to admission. Her symptoms severely worsened after assuming the upright position and markedly improved after resuming the recumbent position. It nearly subsided when she laid down and got much worse when she sat or walked. This resulted in disturbing her daily activities. Her headache was associated with nausea and dizziness. Neither orbital nor neck pain was present. No diplopia, visual loss or other neurological symptoms was noted. She had no history of trauma, neurological surgery, vigorous exercise or lumbar puncture before. Vital signs and systemic examinations were normal. No neurological deficit or neck stiffness was detected.

Laboratory findings including complete blood count, BUN, creatinine, electrolyte, liver function, chest x-ray and electrocardiograph were all normal. Headache attributed to spontaneous low cerebrospinal pressure was diagnosed and lumbar puncture showed that opening pressure was not measurable. Brain magnetic resonance imaging (MRI) with contrast was normal. Radionuclide cisternography revealed 3 sites of CSF leaks at her lumbar area and early bladder activity (Fig. 1).

There was no improvement after bed rest, pharmacologic treatment and saline infusion for a few days. According to 10-15 milliliter of blood to cover

Correspondence to: Udommongkol C, Division of Neurology, Department of Medicine, Phramongkutklao Hospital, Bangkok, 10400 Thailand. Phone/Fax: 0-2354-7637. E-mail address: chesda_udommongkol@yahoo.com

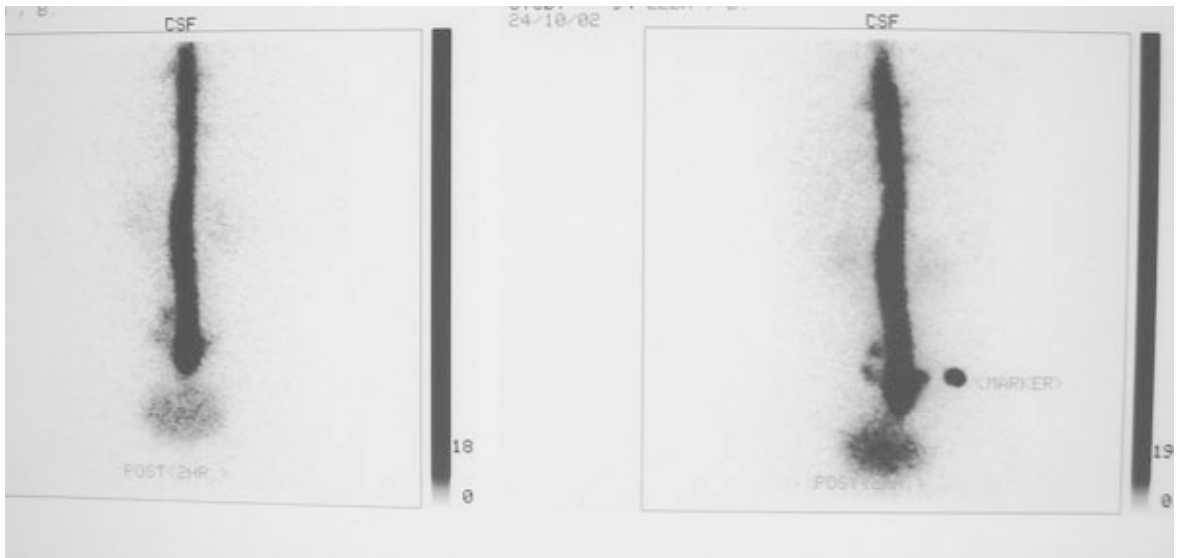

Fig. 1 ^{99m}Tc radionuclide cysternography demonstrated 3 spinal CSF leaks and early appearance of the bladder activity at 2 and 4 hours

1-2 vertebral levels, 30 ml of autologous blood were injected as the epidural blood patch (EBP) to correct multiple leaks at her lumbar area. Her symptoms improved several hours after the intervention without neurological deficits. Her headache had completely gone after a couple of days. There was no relapse of headache after 3 years follow-up.

Discussion

According to the international classification of headache disorders[1], the authors diagnosed one patient as headache attributed to spontaneous low cerebrospinal pressure (previous word; spontaneous intracranial hypotension)[1]. This headache is orthostatic and is typically bilateral and may be frontal, occipital or fronto-occipital. The headache is a consequence of the low CSF pressure producing displacement of pain-sensitive structures[2].

Brain MRI typical findings include intracranial pachymeningeal thickening with diffuse gadolinium enhancement, subdural fluid collections, enlarged pituitary gland, or decreased size of the ventricles or downward displacement of the brain. Spinal MRI findings include collapse of the dural sac, intense epidural enhancement owing to dilatation of the epidural venous plexus, and possible epidural fluid collections[3-6,11,17]. Myelo-MR may suggest the possible point of CSF leakage by demonstrating an irregular root sleeve. Myelo-CT and radioisotope myelocisternography are often needed to confirm the point of CSF leakage[6]. Brain MRI of the present case revealed normal appearance without increased enhancement.

Isotope cisternoscintigraphy using ^{99m}Tc-DTPA helped to confirm the diagnosis and enabled the authors to locate the CSF leak[7]. Criteria is the early appearance of bladder activity with decrease or absence in the distribution in the cerebral convexity even at 24 or 48 hours or visualization of activity in the paraspinal areas[5,8,9,17]. Early appearance of activity in the kidneys and urinary bladder, and may sometimes reveal the level of the leak[5]. CSF leak along the spinal axis and rapid accumulation of radioisotope in the bladder are characteristic and CSF leakage from spinal meningeal defects may be the most common cause of this syndrome[2]. Most leaks are located in the lumbosacral or cervicothoracic region[5,10]. If the scan images do not show CSF leakage at any site, CSF hyperabsorption is the likely pathophysiological mechanism of this entity[9]. The radioisotope cisternograph of the presented case revealed multiple lumbar leaks with early appearance of the activity in the bladder (Fig. 1).

CSF of the presented patient had normal profiles and the pressure was unmeasurable. Low pressure less than 6 mm is a rule and CSF may have pleocytosis or high protein[1,11]. Several modes of presentation are recognized including; 1) the typical clinical-imaging syndrome with CSF pressures consistently within normal limits, 2) absence of diffuse pachymeningeal gadolinium enhancement

with presence of low CSF pressures and typical clinical manifestations, and 3) absence of headaches despite low CSF pressures and presence of diffuse pachymeningeal gadolinium enhancement[12]. The presented case had typically orthostatic headache matched to the international headache society criteria manifesting with 2nd presentation mentioned above[1,12].

Although conservative medical management including bed rest, oral hydration and caffeine intake were the usual first line treatment, conservative treatment failed. Although mostly benign, this condition occasionally can be associated with the formation of clinically significant subdural fluid collections or hematomas[13]. The authors performed epidural blood patch (EBP) by injection of the patient's 30 ml autologous blood. Her symptoms rapidly improved in several hours after the injection and then completely subsided over 1 day later.

EBP or epidural saline infusion can rapidly ameliorate the symptoms of spontaneous intracranial hypotension[2,13]. So the most effective option is an epidural blood patch, which is effective also in the absence of a documented CSF leak[1,14]. Cervical EBP may also be performed and the headache disappeared after several days of injection[15]. A repeated EBP lumbar procedure can be efficient to treat these patients as well[16]. A complete cure is obtained in 77% of patients after one (57%) or two (20%) EBP. So this condition can be cured by early EBP in the majority of patients[17]. An alternative treatment is surgery which is an effective treatment in eliminating the headache and the morbidity is generally low[5,18,19].

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รายงานผู้ป่วยโรคปวดศีรษะอันเนื่องจากแรงดันน้ำหล่อไขสันหลังต่ำซึ่งเกิดขึ้นเอง และการรักษาด้วยการฉีดเลือดเข้าที่ช่องเหนือเยื่อหุ้มไขสันหลังชั้นหนา

เจษฎา อุดมมงคล, สามารถ ราชดารา, เอกชัย เจิดอัมไพ

การรายงานผู้ป่วยหญิงชาวอิตาเลี่ยนอายุ 54 ปี ป่วยด้วยโรคปวดศีรษะอันเนื่องจากแรงดันน้ำหล่อไขสันหลังต่ำซึ่งเกิดขึ้นเอง การตรวจคลื่นแม่เหล็กสมองปกติ การตรวจแรงดันน้ำหล่อไขสันหลังต่ำโดยไม่สามารถวัดได้ และการตรวจกัมมันตรังสีพบรอยรั่วของน้ำหล่อไขสันหลัง 3 จุดบริเวณกระดูกเอวและพบสารรังสีในกระเพาะปัสสาวะในเวลารวดเร็ว ผู้ป่วยได้รับการรักษาใช้เลือดของผู้ป่วยฉีดเข้าช่องเหนือเยื่อหุ้มไขสันหลังชั้นหนา พบว่าได้ผลดีมากและไม่กลับเป็นซ้ำหลังจากติดตามการรักษาถึง 3 ปี