

CASE REPORT

Acupuncture for the Management of Postdural Puncture Headache: A Case Report

针灸用于管理硬膜穿刺后头痛：一份病例报告

Acupuntura para el tratamiento de la cefalea posterior a la punción dural: informe de un caso

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ABSTRACT

Postdural puncture headache (PDPH) is a recognized complication of neuraxial anesthesia. This case report documents 1 patient who developed PDPH following epidural anesthesia for postoperative pain control. The patient declined conventional treatments, including an epidural blood patch and intravenous caffeine. This report documents successful use of adjunct acupuncture for the management of PDPH. Additional research on acupuncture as a potential adjunctive therapy for PDPH is needed, particularly for patients who are reluctant to receive more invasive treatments.

摘要

后硬脑膜穿刺头痛 (PDPH) 是椎管内麻醉的一个公认的并发症。这起案件的报告文件一个病人谁开发PDPH以下硬膜外麻醉术后疼痛控制。患者拒绝常规治疗方法, 包括硬膜外血液补丁和静脉注射咖啡因。该报告记录成功利用辅助针灸治疗PDPH的管理。有必要对针灸作为一种潜在的辅助治疗PDPH进行更多的研究, 特别是对病人谁也不愿意接受更多侵入性治疗。

SINOPSIS

Dolor de cabeza posterior a la punción dural (CPPD) es una compli-

cación reconocida de la anestesia neuroaxial . Este informe documenta casos de un paciente que desarrolló CPPD después de la anestesia epidural para el control del dolor postoperatorio. El paciente se negó tratamientos convencionales, incluyendo un parche hemático epidural y la cafeína intravenosa . Este informe documenta el uso exitoso de la acupuntura complemento para la gestión de la CPPD . Se necesita investigación adicional sobre la acupuntura como un potencial tratamiento adyuvante para la CPPD , sobre todo para los pacientes que se resisten a recibir tratamientos más invasivos.

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Citation

Global Adv Health Med. 2016;5(1):103-106. DOI: 10.7453/gahmj.2015.010

Key Words

Acupuncture, postdural puncture, headache

Disclosures

The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and had no conflicts to disclose.

INTRODUCTION

Accidental dural puncture, estimated to occur in 1.5% of epidural needle insertions, is associated with a 52.1% risk of developing PDPH.¹ Symptoms of postdural puncture headache (PDPH)—which may include neck stiffness, tinnitus, hypacusia, photophobia, or nausea along with headache—usually appear within 5 days after accidental dural puncture.² The headache tends to worsen with sitting or standing but improves with recumbency.² Without treatment, the duration of the headache ranges from 1 day to 12 months, with 53% of cases resolving within 4 days and 72% of cases resolving within 7 days.³ Proposed mechanisms for the headache include traction on pain-sensitive intracranial structures or compensatory intracranial vasodilation, both caused by a decrease in cerebrospinal fluid pressure.⁴ Supportive therapies include rehydration, acetaminophen, nonsteroidal antiinflammatory drugs, opioids, and antiemetics.⁴ Other pharmacological treatments include intravenous or oral caffeine, sumatriptan, desmopressin acetate, and adrenocorticotrophic hormone.⁴ However, the standard treatment of PDPH is the epidural blood patch, in which up to 30 mL of blood is taken from the patient's arm and slowly injected into the epidural space.⁴ Evidence of nonpharmacological

approaches, such as acupuncture, for PDPH is limited. Previous case reports suggest successful use of acupuncture for women who developed PDPH either after receiving spinal blocks for foot surgery or epidural anesthesia for labor.^{5,6} In this case report, we present the use of acupuncture in the management of PDPH in a male patient who declined conventional treatment.

PRESENTING CONCERNS

The subject of this report is a 49-year-old white, married, non-drinking, non-smoking man who was admitted to an academic hospital in January of 2014 for a scheduled colostomy reversal and diverting loop ileostomy. On the day of surgery, he underwent placement of a thoracic epidural catheter for postoperative pain control. During needle insertion, free flow of cerebrospinal fluid was noted. The patient did not feel any pain at that point, and the needle was re-sited without cerebrospinal fluid return. A bilateral block was achieved with fentanyl and ropivacaine, and the surgery was unremarkable. Within 3 days, the patient developed a severe headache.

CLINICAL FINDINGS

During the first and second postoperative days, the patient was treated for severe nausea but was oth-

erwise able to start a clear liquid diet and ambulate. At the start of the third postoperative day, his epidural catheter had fallen out. The catheter tip was intact, and there was no erythema or drainage around the catheter site. During the afternoon, he developed a headache in the bilateral eyes and occiput that was more severe with ambulation and accompanied by photosensitivity and nausea. On a pain numerical rating scale (PNRS) of 0 (no pain) to 10 (worst imaginable pain), the patient reported a pain level of 5 to 6. Due to his symptoms, he felt that he was unable to ambulate or tolerate a diet.

On the fourth postoperative day, the patient's headache continued to worsen to a PNRS of 10/10. He did not experience any relief with the addition of sumatriptan or cyclobenzaprine to his regimen. That afternoon, he received his first acupuncture treatment during his hospital stay. The patient's headache improved over the next several hours, and his PNRS decreased to 7/10 over approximately 3 hours.

On the fifth postoperative day, the patient continued to have a headache with a PNRS of 8/10. He refused both an epidural blood patch and intravenous caffeine. He accepted a second acupuncture treatment. Within 30 minutes after the treatment, his PNRS decreased to 5/10. On the next day, the patient was ambulating once again, tolerating a regular diet, achieved adequate pain control with oral analgesics, and had a minimal headache with a PNRS of 2/10. He was discharged home.

His past medical history was remarkable only for diverticulosis, asthma, gastroesophageal reflux disease, depression, and anxiety. He underwent a sigmoid colectomy with end colostomy in August of 2013 for an

obstructive sigmoid mass with findings concerning for segmental diverticular associated colitis vs Crohn's disease. He also underwent an exploratory laparotomy following a penetrating injury to his right upper quadrant in 1982. His home medications included omeprazole, tramadol, quetiapine, amitriptyline, and alprazolam.

He had previously used complementary and integrative health approaches. In the prior 12 months, he had used nutritional supplements such as probiotics, herbal or nonvitamin supplements such as marijuana, Chinese medicine, and manual therapy such as massage or acupuncture. He had also used acupuncture, although not in the prior 12 months.

DIAGNOSTIC FOCUS AND ASSESSMENT

From a Western medicine perspective, PDPH was the most likely diagnosis given the history of the patient's symptoms in relation to the accidental dural puncture. His history and physical exam were less concerning for other processes, such as a migraine, tension headache, medication-overuse headache, sinus headache, or brain tumor.

A licensed acupuncturist with more than 30 years of experience as a traditional Chinese medicine (TCM) practitioner assessed the patient using standard TCM diagnostic techniques, including examination of the patient's tongue and pulse and clinical questioning about signs and symptoms. The acupuncturist diagnosed the patient with having an excess of damp-heat in the Gallbladder, Liver, Stomach, and Spleen channels, as well as stagnation in the flow of qi and blood. This diagnosis was supported by the observation of a purple tongue and slippery pulse, as well as a patient-reported history of stress, poor diet, and lack of exercise.

Table 1 Medication Use of Patient With Postdural Puncture Headache

Postoperative Day	PNRS of Headache (Range Throughout Day)	Analgesics and Dose	Antiemetics and Dose
1	N/A	Acetaminophen 4000 mg Ketorolac 60 mg Hydromorphone 1.2 mg Morphine 3 mg Epidural: ropivacaine 0.1%, rate of 8-10 mL/h	Scopolamine patch 1.5 mg Ondansetron 20 mg Lorazepam 2 mg
2	N/A	Acetaminophen 3000 mg Ketorolac 60 mg Morphine 12 mg Lidocaine patch 700 mg Epidural: ropivacaine 0.1%, rate of 10 mL/h	Scopolamine patch cont Ondansetron 16 mg
3	1-6	Acetaminophen 3000 mg Ketorolac 45 mg Morphine 12 mg Lidocaine patch 700 mg	Scopolamine patch cont Ondansetron 12 mg Lorazepam 1 mg
4 Received acupuncture	7-10	Acetaminophen 4000 mg Morphine 9 mg Sumatriptan 75 mg Cyclobenzaprine 10 mg	Scopolamine patch 1.5 mg Ondansetron 20 mg Lorazepam 1.5 mg
5 Received acupuncture	5-8	Acetaminophen 2000 mg Sumatriptan 50 mg Cyclobenzaprine 10 mg	Scopolamine patch 1.5 mg Ondansetron 4 mg Lorazepam 0.5 mg
6 Discharged	2		

Abbreviations: N/A, not applicable; PNRS, pain numeric rating scale.

THERAPEUTIC FOCUS AND ASSESSMENT

The patient received the addition of sumatriptan and cyclobenzaprine for his PDPH, without much effect (Table 1). He refused an epidural blood patch and intravenous caffeine.

After obtaining informed consent for acupuncture, the licensed acupuncturist provided 2 treatment sessions at the bedside. During the first session, the following bilateral acupuncture points were selected in order to help dispel damp-heat and promote the circulation of qi and blood: GB 21, GB 40, ST 36, LI 4 and LR 3 (right only), for a total of 9 needles (Table 2).⁷ Acupuncture points were first sterilized with a disposable 70% isopropyl alcohol pad. Sterile, disposable acupuncture needles (Seirin J-Type: size 0.18 x 30 mm and 0.20 x 40 mm) were inserted at a depth of approximately 1 mm to 2 mm and manually manipulated with a twisting motion until a sensation of *deqi* was felt by the acupuncturist. The acupuncture needles were then left in place for approximately 30 minutes while the patient lied supine. The acupuncturist remained at the patient's bedside throughout the session. During the second session, the following acupuncture points were used in addition to the same points used on the previous day: Ex-HN 3 and SP 6 (right only), for a total of 11 needles. Needles were retained for approximately 30 minutes. Both treatments were well tolerated by the patient.

FOLLOW-UP AND OUTCOMES

After the first acupuncture session, the patient's PNRS decreased from 10/10 to 7/10 over a period of several hours. After the second acupuncture session, his PNRS decreased from 8/10 to 5/10 within 30 minutes. By the next morning, the patient reported that his headache was minimal with a PNRS of 2/10.

The patient was contacted via telephone 5 months after discharge, and he reported that he did not have any recurrence of headaches since his hospitalization. There were no adverse events from the acupuncture treatments.

DISCUSSION

Our patient experienced a postdural puncture headache (PDPH) severe enough to interfere with

ambulation and delay his discharge. He achieved symptomatic relief with a combination of analgesics, antiemetics, and 2 sessions of acupuncture. Bedside acupuncture treatments were made available to this patient as part of an initial testing phase of a clinic-research partnership to establish acupuncture inpatient services. As a result, the patient had an additional non-pharmacological treatment available to him while the acupuncturist had the opportunity to treat a condition that does not typically present in ambulatory clinical practice. Study procedures were approved by the institutional review board (IRB) of the University of California San Francisco. The use of acupuncture was fully supported by the hospital unit's staff, including patient care managers and nurses. The acupuncturist performed the treatments in the patient's hospital room in accordance with our study protocol, which included an individualized treatment plan based on the patient's TCM diagnosis. The patient did not experience any adverse effects from the acupuncture. In general, acupuncture is quite safe with very low risk of adverse events. Side effects that do occur are usually minor and self-limiting, such as localized bleeding or pain.⁸

From a Western medicine perspective, acupuncture is thought to exert its therapeutic effects by modulating the release of neuropeptides and neurotransmitters, such as substance P and enkephalin, that can reduce pain by suppressing the trigeminal nucleus caudalis and spinal dorsal horn neurons.⁹ From a traditional Chinese medicine perspective, needling at specific points in the body relieves painful blockages in the flow of qi, which is often translated as the "vital energy" or "life force" that flows along meridians or acupuncture channels.⁹

Prior case reports of acupuncture for PDPH do not discuss patients' TCM diagnoses, but there is overlap between our case study and others in regards to the specific acupuncture points used.⁶ As far as we know, there is no standard protocol for acupuncture point selection in PDPH. Point selection may be challenging to standardize given the nature of the TCM approach, where treatment plans are individualized according to a holistic assessment of the patient.

The epidural blood patch has been shown to be an

Table 2 Acupuncture Points Selected for Patient With Postdural Puncture Headache

Acupuncture Points	Indications	Treatment Principles
GB 21, GB 40	Stiffness and pain of the neck and shoulders (GB 21); headache (GB 40)	Promote the circulation of qi and dispel damp-heat in the gall bladder channel in order to alleviate pain caused by their stagnation
LI 4, LR 3	Headache (LI 4); headache and nausea (LR 3)	Treat pain caused by obstruction in the flow of qi and blood
ST 36	Dizziness, headache	Promote the circulation of qi and dispel damp-heat in the stomach channel in order to alleviate pain and impaired stomach function, such as nausea
Ex-HN 3	Agitation, anxiety, and headache	Alleviate pain
SP 6	Painful obstruction caused by damp; no desire to eat and drink; gall bladder deficiency	Dispel damp-heat and support spleen functions, including transportation of fluid and formation of qi and blood

effective treatment for PDPH, with 1 study finding that epidural blood patch led to complete relief in 75% of patients with severe PDPH.¹⁰ Complications of epidural blood patch include neck or back pain that is usually transient, radicular symptoms, irritative meningeal symptoms, and problems with subsequent epidural anesthetics.¹¹ Once patients have a PDPH, they may be reluctant to undergo another epidural needle injection. Our patient declined treatment with an epidural blood patch because he preferred a less invasive approach. He had used acupuncture in the past and was amenable to trying it for his headache.

While it is likely that this patient's symptoms would have resolved on their own with time, using acupuncture as an adjunctive therapy resulted in patient-reported improvements in pain intensity which he cited as a barrier to ambulation and therefore may have facilitated a more timely discharge. It is clearly not possible to draw conclusions about the efficacy of acupuncture for PDPH based on a single case study, and the therapeutic benefits of acupuncture that exceed time and attention from a caring practitioner remain highly controversial.¹² Nonetheless, in addition to subjective improvements experienced by the patient, based on qualitative feedback, acupuncture had an added benefit of contributing to the patient's overall satisfaction with his medical care.

Meta-analysis of randomized controlled trials supports the use of acupuncture for various pain conditions, including back and neck pain and chronic headache.¹³ Additional research on acupuncture as a potential adjunctive therapy for PDPH is needed, particularly for patients who are reluctant to receive more invasive treatments.

PATIENT PERSPECTIVE

In addition to reporting that the acupuncture helped reduce his pain, the patient expressed additional benefits:

I just think it made me feel better overall, gave me some relief from my headache and nausea. It was positive therapy. And the thing is, it's really weird in the hospital these days, but no one wants to touch you. There's an invisible barrier in the hospital. The surgeon doesn't want to touch you. It's a weird thing that Western medicine has decided, "We're happy to write you a prescription, but we won't rub your shoulders." It seems backwards. It's easier to throw a prescription. It's harder to take the time to relate to a patient and give them a feeling of comfort.

Acknowledgments

This case study was part of a larger clinical trial with funding support from the Mount Zion Health Fund, National Institutes of Health (NIH), National Center for Complementary and Integrative Health (NCCIH) (Chang: T32AT003997, Chao: K01AT006545);

and the National Center for Advancing Translational Sciences (KL2TR00143). The funding sources had no role or involvement in the design and conduct of the study; the collection, management, analysis, or interpretation of the data; or in the preparation, review, or approval of the manuscript. Contents are solely the responsibility of the authors and do not necessarily represent the official views of the funders.

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