

Use of epidural blood patch in treating chronic headache: report of six cases

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Chronic headaches are difficult problems to manage effectively. A select group of six patients with headache symptoms (throbbing headaches, located in the frontal or occipital areas; aggravated by ambulation and relieved by recumbency) resembling post-dural puncture headache received epidural blood patches using autologous blood for their chronic headaches. Five of the six patients obtained effective and sustained pain relief. All of the patients had received placebo injections with normal saline in the paraspinous muscles, without effect. The mechanism of action of the blood patch in these patients is unclear. It is possible that the headache may have been caused by a low pressure cerebrospinal fluid state, due to an unknown anatomical or physiological defect of the ventriculo-spinal system. Further studies are needed to evaluate this treatment modality.

Chronic headaches are distressing not only to patients but also to physicians treating them. The number of different treatments used attest to the fact that chronic headache represents an often intractable and complex problem. The relief of acute post-lumbar puncture headache by epidural blood patch is usually prompt and permanent.¹ We recently treated a patient with chronic headache which resembled post-dural puncture headache² as far as character, location, aggravating and relieving factors are concerned. We used an epidural blood patch, preceded by a negative placebo response, with immediate relief from her long-standing headache that has continued throughout a fourteen-month follow-up. Following this, five other patients with chronic headache have been treated with epidural blood patch with good results in four patients (Table). To the best of our knowledge, this treatment

modality has not been previously described for treating chronic headache.³

Case reports

Case 1

A 27-year-old white woman presented with a history of headaches of three and a half years' duration. The headaches began in the 24th week of her only pregnancy. At that time she was evaluated by a neurologist; the neurological examination, including visual field testing, CT scan, blood tests and diagnostic lumbar puncture was normal. Her cerebrospinal fluid pressure was within normal limits and her headache continued unchanged after the lumbar puncture, for the remainder of her pregnancy. She underwent Caesarean section at another hospital, where epidural anaesthesia was administered, without apparent complications. In the postpartum period her headaches continued. Six weeks postpartum she was seen by another neurologist and was re-investigated and treated with a variety of drugs (propranolol, amitriptyline, meperidine, propoxyphene, oxycodone and verapamil) without relief.

During our evaluation, she indicated her pain as being located in the frontal area and radiating to the occipital area. The pain was described as piercing, sharp and throbbing in character but always present with varying periods of exacerbation. The pain was aggravated by ambulation and was relieved by recumbency. Her subjective pain intensity rating using the visual analog scale was 45 per cent under basal conditions and 90 per cent during exacerbation.

Her social profile was unremarkable. She worked as a secretary but her headaches contributed to significant absenteeism and marital discord. Her physical examination was unremarkable except for moderate obesity. She was classified as a "low pain behavior-low pain pathology" patient (Emory University Class II patient)⁴ and the following therapeutic modalities were recommended to her: (1) psychological assessment, (2) biofeedback (a physiological technique to induce muscle relaxation and to decrease stress), (3) relaxation exercises, (4) a series of

Key words

PAIN: headache, chronic; HEADACHE: chronic;
EPIDURAL SPACE: autologous blood injection.

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TABLE Results of patients with headache treated with epidural blood patch

Case	Age	Sex	Neurological findings	Behavioural findings	Placebo response	Pre-treatment Duration of pain	Duration of pain relief†
1	27	F	Negative	*Depression	Negative	3.5 yrs	14 months
2	52	M	Negative	Normal	Negative	10 yrs	8 months
3	30	F	Negative	*Depression	Negative	15 mos	3 months
4	47	F	Negative	Normal	Negative	6 yrs	12 months
5	25	F	Negative	*Hysteria	Negative	4 yrs	No relief
6	62	F	Negative	Normal	Negative	20 yrs	5 months

*Depression and hysteria were mild in all cases.

†Period of pain relief from epidural blood patch to most recent evaluation.

left stellate ganglion block, and (5) a trial of epidural blood patch.

Because of the incapacitating nature of the patient's orthostatic pain and because she was reluctant to try other less invasive treatments offered her, it was decided to proceed with the epidural blood patch as a first line of therapeutic management. After obtaining informed consent, a placebo injection of 10 ml normal saline was made into the right paraspinous area at L₃₋₄ level, with no effect on the headache after 15 minutes. Following this, a 17-gauge Husted needle was introduced atraumatically into the epidural space at the L₃₋₄ level. After negative aspiration tests 10 ml of venous blood was taken from the patient and was then injected through the epidural needle into the patient's epidural space, following which the needle was immediately withdrawn. Shortly afterwards, the patient obtained satisfactory pain relief which has been sustained for fourteen months.

Case 2

A 52-year-old white male was referred with a 1-year history of throbbing headache in the right temporo-parietal area. Previous neurological evaluations, radiological and biochemical investigations were unproductive. A large number of pharmacological agents prescribed over the ten years had not provided significant relief. His psychological profile was normal. Placebo-injection with normal saline gave no relief while epidural blood patch produced immediate pain relief which remains after eight months.

Case 3

A 30-year-old female complained of frontal headache of 15 months' duration. This headache had worsened in the previous five months and the exacerbation may have coincided with an irreversible marital discord associated with mild depression. Neurological evaluation was non-contributory. Psychological counseling, biofeedback, tri-

cyclic antidepressant drugs and relaxation exercises produced no sustained pain relief. She was treated with an epidural blood patch (after negative saline placebo injection) which produced satisfactory pain relief, persistent for three months, to date.

Case 4

A 47-year-old female college professor presented with a six-year history of throbbing occipital headache aggravated by activity and relieved by lying down. Physical examination was negative and neurological investigations showed no evidence of disease. Her psychological profile was normal. The patient refused all pharmacological agents so as not to interfere with her job performance. Epidural blood patch with autologous blood produced adequate pain relief persistent at 12 months follow-up. Prior placebo injection with saline had produced no discernible effect.

Case 5

A 25-year-old female presented with constant throbbing occipital headache for approximately four years' duration. Physical examination and radiological investigation were normal. Psychological assessment revealed significant hysterical behaviour. The patient refused psychotherapy and was treated with an epidural blood patch which produced no improvement. No relief was obtained with a saline placebo injection.

Case 6

A 62-year-old female presented with a 20-year history of intermittent throbbing frontal headache. Physical examination and neurological evaluation were non-contributory. Her psychological profile was normal. A variety of conventional modalities produced no pain relief for this patient. Saline placebo injection produced no pain relief. An epidural blood patch with autologous blood produced partial pain relief, persistent for five months.

Discussion

The epidural blood patch technique has been employed since 1960, for the treatment of post-lumbar puncture headache.³ this procedure has been widely used and is now accepted as a safe and effective method for treating post-lumbar puncture headaches⁶ after conservative measures have failed. The success rate of epidural blood patch for acute post-lumbar puncture headache is approximately 92 per cent.⁷ The common sites for post-lumbar puncture headache include the occipital and the frontal areas.⁸ Clinical features of a post-lumbar headache include exacerbation of the headache on ambulation with improvement on recumbency. Common complications of epidural blood patch include back pain,⁹ neckache, and a transient elevation of temperature. Meningeal irritation¹⁰ has been occasionally reported.

The mechanism of action of epidural headache in the treatment of acute post-dural puncture headache is controversial. It is postulated that the injected blood has a "sealant" effect at the side of the dural puncture. Another hypothesis is the "pressure" effect caused by the injected blood.¹¹ The possible mechanism of action of the epidural blood patch in the patients presented is even less clear. It is possible that these patients may have a low cerebrospinal fluid pressure state caused by an anatomical or physiological defect of the ventriculo-spinal system. Further studies need to be undertaken to explore this phenomenon and its mechanism.

A review of clinical data of the patients described indicates that the criteria for selection of patients for trial of epidural blood patch were long-standing, throbbing headaches; relieved by recumbency; aggravated by ambulation; negative neurological evaluation; normal psychological profile and failure of conventional modalities. These modalities include psychological testing with behaviour modification, biofeedback, relaxation exercises, acupuncture, transcutaneous nerve stimulation, stellate ganglion blocks, sphenopalatine blocks, injection of suboccipital and temporal trigger points, hypnosis and neurosurgical procedures in selected patients. Various drugs have been used and the more current ones include the use of the beta blockers, tricyclic antidepressants, phenothiazines, calcium channel blockers and non-steroidal anti-inflammatory drugs.

In a search for a consistent and effective treatment of headache patients, the use of the epidural blood patch was attempted because of the similarity of symptoms in selected patients to those of acute post-lumbar puncture headache patients. Using the criteria mentioned above, five of the six patients described obtained satisfactory relief following the epidural blood patch. The procedure was performed after informed consent was obtained.

While it is premature to assess the efficacy of this technique for managing chronic headache, it is useful to point out that the epidural technique was the same in all the patients. More studies have to be carried out before this technique can be recommended as a reliable and safe alternative approach to managing selected chronic headache patients.

In summary, we present six patients with a history of chronic headache; all the patients received epidural blood patch for pain relief. Five of the six patients had satisfactory pain relief. The mechanism of action of epidural blood patch is unclear in patients with chronic headaches. Further studies are currently being undertaken to determine the consistency and efficacy of this possible therapeutic modality.

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Résumé

Il est difficile de traiter efficacement les céphalées chroniques. Un groupe de six patients souffrant de maux de tête (céphalées lancinantes, situées dans les régions frontales et occipitales; dont la douleur empirait à la mobilisation et s'allégeait en position couchée) semblables à une céphalée se produisant à la suite d'une ponction de la dure-mère, ont été choisis pour recevoir des caufeuuraage sanguins "blood patch" péri-duraux de sang autologue pour leurs cephalées chroniques. Pour cinq des six patients le soulagement de la douleur fut efficace et soutenu. On avait injecté des placebos de salin normal dans les muscles paraspinaux de tous les patients et ce, sans résultat. Nous ne sommes pas certain du mécanisme d'action du caufeuuraage sanguin chez ces patients. Il se peut qu'un état de basse pression du liquide céphalorachidien en raison d'un défaut anatomique ou physiologique du système ventriculo-rachidien soit la cause de la céphalée. Des études contrôlées plus poussées sont nécessaires afin d'évaluer ce genre de traitement.