Chronic Headache and the Pain Clinic

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Abstract: Nerve block is the mainstay of therapy at pain clinics in Japan. The results of nerve blocks, namely the blocking of sensory pain pathways, vicious cycles of pain, sympathetic neural functions, and motor nerves are very useful in treating pain. If the same effects are to be obtained by drug administration, the concomitant use of many drugs with different actions is necessary, but even so, the effects would not be as good as those of nerve blocks. The headaches that are dealt with at pain clinics are mostly chronic, recurrent headaches such as migraines, cluster headaches, tension-type headaches, and posttraumatic symptomatic headaches. Headaches that originate in the cervical spine, although they are acute in nature, also respond well to nerve blocks. Stellate ganglion block, gasserian ganglion block, trigeminal nerve branch block, and occipital nerve block are the major nerve blocks that are used for the treatment of headaches. The concomitant use of general drugs as well as oriental therapies is also common.

Key words: Chronic headache; Pain clinic; Nerve block

Introduction

The idea of a pain clinic as a separate medical division is not yet sufficiently understood by the people at large. However, pain clinics already have a history of nearly 40 years as a clinical division, performing their activities aimed at relieving patients’ pain.

The institute where the author works has started its activities as a pain clinic in September 1966 as part of the Department of Anesthesia. On July 1, 2001, it became independent as Japan’s first Department of Pain Medicine at a University School of Medicine, and treatment and research of pain are conducted there.

The significance of nerve blocks, the treatment of choice at pain clinics, as well as the control of chronic headache, as we conduct it, are introduced from the perspective of a pain clinic physician whose objective is to treat pain.

What is a nerve block?

Modern pain clinics proactively adapt and employ various methods, such as drugs, surgery, psychophysiological therapy, and oriental therapies, which may be helpful in the treatment of pain. However, the present medical division has a history of being the first to treat patients’ pain with nerve blocks; and nerve
blocks are therefore the mainstay of its treatment methods.

A nerve block is defined as follows: “a procedure that temporarily or permanently blocks the functions of nervous transmissions by inserting a block needle along the cerebrospinal nerves, the cerebrospinal ganglion or the sympathetic ganglion and nerve plexuses that form these, and injecting a local anesthetic or neurolytic agent directly into or near the target.”

The effects of nerve blocks in the body are very important in the treatment of such chronic pains as headaches.

1. Blocking the sensory pain pathways

Eliminating patients’ pain greatly contributes to the improvement in their quality of life (QOL), although it is not a radical treatment. The ability to eliminate pains that result from modern medicine’s inability to prevent such pains, e.g. cancer pain, is highly valuable.

In addition, in the case of trigeminal and glossopharyngeal neuralgia, where the only symptom is that of excruciating pain, a reliable nerve block can completely stop a long-lasting crisis for a period of a few months to several years (Fig. 1).

2. Blocking vicious cycles of pain

Noxious stimuli are transmitted to the central nervous system from the peripheral nerves via the spinal cord, and they simultaneously excite the sympathetic and motor nerves along the spinal reflex pathways. As a result vasospasm and muscle tension occur in the affected area and its surroundings. A decrease in the local blood flow and oxygen deficiency then accelerate abnormal metabolism, the production and release of algogenic substances are promoted in the local area, and the sensitivity of nociceptors increase. A vicious cycle consequently develops (Fig. 2). The best procedure to interrupt this vicious cycle is a nerve block.

![Fig. 1 Gasserian ganglion block](Image)

A block needle is passed through the oval foramen and inserted into the trigeminal ganglion. Blocking of trigeminal nerve branches, e.g. supraorbital/infraorbital nerves, maxillary nerves, or auriculotemporal nerves are also conducted as necessary.

![Fig. 2 Formation of a vicious cycle of pain](Image)
3. Blocking sympathetic neural functions

When sympathetic neural functions are blocked by a nerve block, the local blood flow increases, sweating is suppressed, and the sympathetic sensory nerve branches are blocked. Ischemic pain usually requires an increase in the local blood flow (Fig. 3).

4. Prevention of pain development

If an intercostal nerve block is used concomitantly with open chest surgery, development of the so-called post-thoracotomy pain syndrome can be prevented. In the case surgery for intra-abdominal tumors are concluded with an exploratory laparotomy, the possibility of preventing the development of post-operative pain is higher if a block of the celiac plexus or the inferior mesenteric plexus is conducted during the open surgery. Similarly, sufficient analgesia by means of a nerve block during the acute stage of herpes zoster is expected to prevent the development of postherpetic neuralgia.

5. Blocking motor nerves

Reducing muscle tension with a motor nerve block is indispensable when treating pain.

Headaches Treated at Pain Clinics

When considering the kinds of headache treated at pain clinics (i.e. with nerve blocks), it is good to distinguish between “acute” and “chronic” headache: the pain of the former starts abruptly, while the pain crisis repeats itself or persists for years with the latter.

Acute pain occurs suddenly and lasts only temporarily. In most cases it heals naturally; however, acute pain is often cured by taking commercially available analgesic medications two to three times. Nevertheless, the causes of acute pain also include fatal subarachnoid hemorrhage and glaucoma, which may lead to blindness.

Special attention should be paid to an intense headache that has never been experienced before, a headache that gradually worsens, or a headache with concomitant symptoms such as abnormal vision, fever, vomiting, or movement disorders of the four extremities. A headache that develops after the head was knocked is also a reason for concern. Such headaches may not become the subjects of nerve blocks.

In other words, the headaches for which nerve blocks can be applied are chronic headaches that persist for years or repeat a cycle of crisis and abatement; therefore, acute headaches with the characteristics described above, are not considered treatable by nerve block. Functional headaches such as migraine, cluster headache, and tension-type headache are considered treatable by nerve block. In addition, symptomatic headaches, in which pain persists after the injury or disease has been stabilized, and neuralgia are also treatable by nerve blocks.

Although a headache that originates in the cervical spine is acute, nerve block is an excellent therapeutic method for this type of headache.

Treatment of Headaches at Pain Clinics

1. Drug therapy

Concerning the basic drug therapies available for functional headaches, e.g. vasodilators, vasoconstrictors, and muscle relaxants, the ma-
The majority of doctors who treat headaches on a daily basis use the same regime. However, it is common that most patients with chronic headache who are referred to pain clinics have already received basic drug therapy for a long period of time. The patients often turn to pain clinics because the drug therapy did not have satisfactory results.

The characteristics of the drug therapy at pain clinics are that antiepileptic drugs and antidepressants are often employed, not only for the treatment of the headache as such, but also of so-called chronic pains. In addition, Chinese herbal medicines are frequently used.

Antiepileptic drugs are effective for sharp pain that is described as a running, electric, lightning, stabbing, or cutting sensation. Antidepressants, on the other hand, are effective for dull pain that is described as a numbing, squeezing, aching or squashing sensation. Moreover, many patients with chronic headache are in a “depressive state,” because they have suffered headaches for years. In such a case, antidepressants give even better results.

The use of Chinese herbal medicines is based on experience and is not directly, theoretically linked to the mechanisms of headache. However, if the patient’s condition and the selected drug are well matched, dramatic effects are produced. The following Chinese herbal medicines are frequently employed: goshuyu-to, kamishyoyou-san, choutou-san, gorei-san, oren-gedoku-to, and kakkon-to.

2. Nerve blocks

Nerve Blocks become helpful when pain cannot be controlled with the typical drug therapy for chronic headache (Table 1).

The following nerve blocks are mainly employed for chronic headache:

(1) Stellate ganglion block

When the stellate ganglion is blocked, blood flow to the head, face, neck, upper extremities, and upper chest increases, and these areas become warm. As a result, it gives a good feeling and in some cases, leads to sleepiness. Sym pathetic nerves are activated when a person becomes extremely excited and tense. The advantage of this kind of block is that it opposes the sympathetic nerves, creating a calm situation. It is suggested that, in the case of headaches that are caused by the dilation of blood vessels (migraine and cluster headache), repeated employment of this block stabilizes the activity of the blood vessels, and a crisis consequently occurs seldom.

Stellate ganglion blocks are used for the treatment of migraines, cluster headaches, symptomatic trigeminal neuralgia, and atypical facial pain.

(2) Blocking of the gasserian ganglion and trigeminal nerve branches

Since the trigeminal nerves control all sensation of the head (excluding the occipital area), the face, and the cranium, a headache inevitably means excitement of these nerves. If these nerves are blocked, all sensation of the head and face disappear, and it is obvious that the headache is no longer present, either.

Theoretically, a headache cannot be felt when the trigeminal nerves are blocked. If a patient still experiences pain under such circumstances, it is not exaggerated to assume that the pain is caused by other factors, e.g.
psychologic problems.

Blocking of the gasserian ganglion and the trigeminal nerve branches are most effective for the treatment of idiopathic trigeminal neuralgia, but is also applied to migraines, cluster headaches, symptomatic trigeminal neuralgia, and atypical facial pain.

(3) Occipital nerve block

Since the second and third cervical nerves control the area from the posterior region of the neck to the parietal region, pain in this area can be treated by blocking the greater occipital nerves, arising from the second or third cervical nerves, while blocking of the lesser occipital nerve is used for pain that occurs in the occipital area.

Depending on the type of pain, root blocks of the second and third cervical nerves are often used.

Occipital nerve blocks are employed for idiopathic occipital neuralgia and cervical headaches.

Conclusion

I hope you can see that the treatment of chronic headaches at pain clinics does not only consist of a combination of general drug therapy and nerve blocks, but in order to decrease patients’ pain, other methods are also pro-actively incorporated if necessary to alleviate other pains.