

Avoiding Unnecessary Diagnostic Examinations in Patients with Cervicogenic Headache: Three Case Reports

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Abstract: A cervicogenic headache (CGH) presents as unilateral pain that starts in the neck. It is a common chronic and recurrent headache that usually starts after neck movement and is associated with a reduced range of motion (ROM) of the neck. CGH is not well recognized and may be confused with migraine, tension headache, or other primary headache syndromes. As a result, patients may undergo multiple diagnostic examinations, before it is diagnosed. However, if it is suspected initially, CGH can be easily diagnosed and managed with diagnostic blocks. This study reports three cases of severe CGH. Among these, two patients could not be diagnosed in other hospitals and they visited the author's clinic subsequently. The third patient directly visited the author's clinic, so he was diagnosed and treated rapidly.

Keywords: cervicogenic headache, nerve blocks.

INTRODUCTION

Headache is one of the most common symptoms in patients. A third of the population is expected to experience severe headaches at some stage of life. However, since most people with a mild recurrent or isolated headache do not visit a physician, the true prevalence of headaches is unknown. There are many types of headaches comes from brain but some headaches does not. CGH is one of them.

The International Classification of Headache Disorders 3rd edition beta (ICHD-3 beta) groups headaches into three categories [1]: primary headaches; secondary headaches; and painful cranial neuropathies.

CGH which presents as unilateral pain that starts in the neck, belongs to the second category. ICHD-3 beta suggests the diagnostic guideline of CGH. Headaches associated with the neck have been described since 1853[2]. However, the term "cervicogenic headache" was proposed by Sjaastad in 1983[2]. On behalf of the Cervicogenic Headache International Study Group (CHISG), Sjaastad suggested the revised confirmatory criteria for diagnosis of CGH [3].

When patients with CGH visit, if we do not know CGH, we can take unnecessary diagnostic examination including brain MRI or magnetic resonance angiography (MRA). So the author report three cases in which the clinical presentations, courses, and treatment methods were somewhat different.

CASE REPORTS

Case 1

A 55-year-old female patient who had been experiencing left headache without any recognizable

cause for 2 months presented to our clinic. Her headache worsened when she was supine. The numeric rating scale (NRS) score was 8/10. Physical examination revealed limitation in neck movement, pain in the left neck and head, especially in the left temporal area, on resisting the motion of the neck, and tenderness on light pressure on her left neck. Before coming to our clinic, she had visited another hospital where she underwent brain magnetic resonance (MRA) and MRI, which showed no abnormality. The laboratory data were normal, except for slightly elevated C-reactive protein levels. Diagnostic greater and lesser occipital nerve blocks with 0.25% bupivacaine 2 cc + triamcinolone 2 mg each were tried but lasted for one day. After a second trial was also found to not last for more than 24 hours, C2 ganglion block and third occipital nerve block with 0.25% bupivacaine 2 cc + dexamethasone 1 mg each were tried and her pain disappeared (Fig 1 a, b, Fig 2 a, b). Her pain has not recurred in three months subsequently.

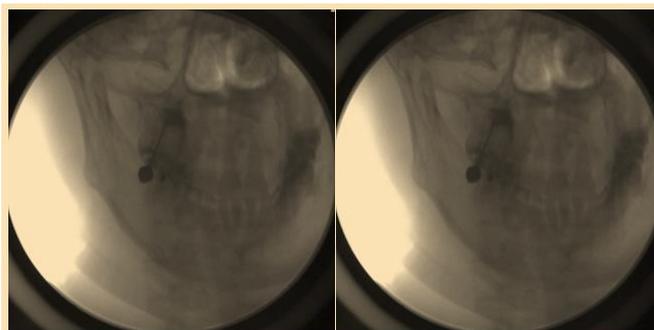


Fig-1 a, b: Left C2 ganglion block AP & lateral view

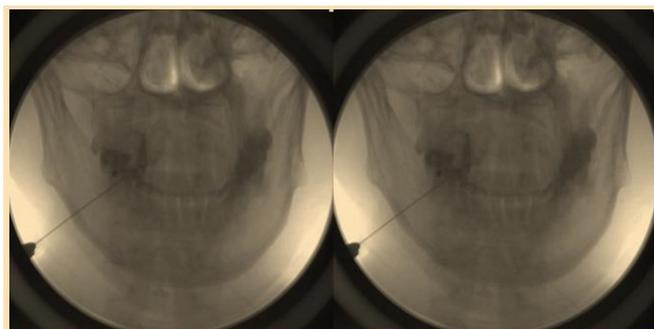


Fig-2 a, b: Left third occipital nerve block AP & lateral view

Case 2

A 65-year-old female patient who had been experiencing left neck and head pain for more than 3 years visited our clinic. She had a history of rheumatoid arthritis, asthma, and myocardial infarction and had been cared for at other hospital. However, she changed the hospital when she moved. She complained that the pain was so severe that she could hardly sleep. The NRS score was 9/10. Physical examination showed limitation of neck movement, pain in the left neck and head, especially the left frontal area, on passive neck motion, and tenderness on the left upper neck. The laboratory data were normal. A C-spine CT image obtained 3 years back showed atlantoaxial rotation (Fig. 3). Diagnostic greater and lesser occipital nerve blocks with 0.25% bupivacaine 2 cc + triamcinolone 2 mg each were tried but lasted for less than 24 hours. After the second trial also did not last more than 24 hours, the author suggested a spinal procedure. However, she

refused and consulted other departments and other hospitals where brain CT, MRI, and MRA were performed. These examinations showed no abnormalities except patchy, nonspecific, low white matter densities in the cerebrum. She revisited our department and underwent a C-spine CT examination, which showed greater degeneration in the C1-2 area (Fig. 4). The author diagnosed CGH caused by progressive rheumatoid arthritis and started medication with titration until the proper medication and dosage could be identified with the above peripheral blocks. The final medication protocol included a norspan patch (buprenorphine; Mundipharma Korea) 20 µg/hour, Nucynta (tapentadol hydrochloride; Janssen Korea) 150 mg bid, and Targin (oxycodone/naloxone, Mundipharma Korea) 5/2.5 mg bid. She continues to undergo monthly follow-up assessments with the same protocol, and her pain is currently tolerable (NRS: 3/10).



Fig-3: C-spine CT axial view at the C1/2 level taken three years before the visit: Atlantoaxial rotational state due to r/o positional change or atlantoaxial rotational subluxation

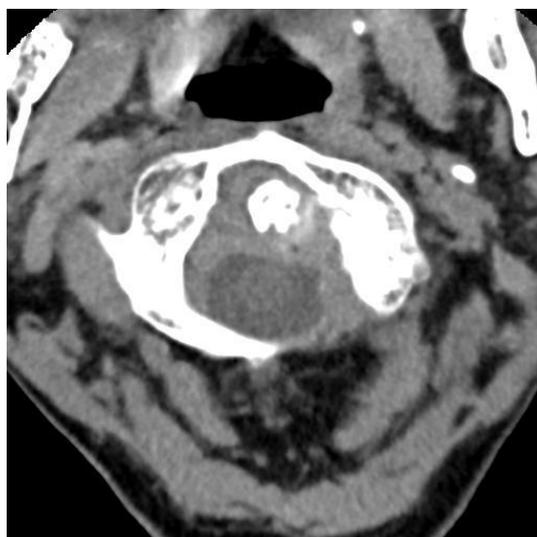


Fig-4: C-spine CT axial view at the C1/2 level: Cervical spondylosis, focal contour deformity, C2 (left side of odontoid base) C1/2; degenerative change of the atlantoaxial joint, widening of the atlantoaxial joint space, and mild counterclockwise rotation of the C2 on C1, R/O rotatory subluxation with instability

Case 3

A 56-year-old male patient visited our clinic for left neck and head pain with numbness on the left second finger for 15 days. He had stumbled and fallen on a stairway, after which the above symptoms developed. He denied any underlying disease but hypertension. The NRS score was 8/10. Physical examination showed limitation of neck movement and pain in the left neck and occipital area and radiating pain to the arm on passive motion of the neck. He also reported tenderness on his left neck. Laboratory data

were normal. A C-spine MRI showed osteoarthritis and spinal stenosis on the left C2/3 facet joint, and a bulging disc with osteophytes and both foraminal stenosis on the C5/6 level (Fig. 5 a, b). A third occipital nerve block with 0.25% bupivacaine 2 cc + dexamethasone 1 mg (Fig. 6 a, b) and a cervical epidural block with 0.1% bupivacaine 5 cc + dexamethasone 1 mg (Fig. 7 a, b) were attempted. Subsequently, his pain subsided by 60%. After the second trial, the pain subsided by 90%. Two months later, his symptoms were well under control.

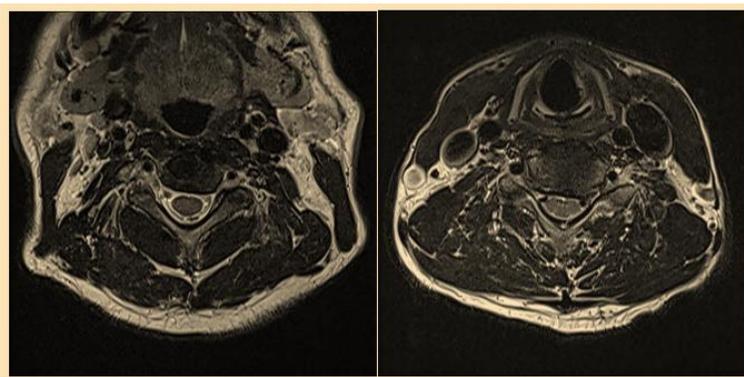


Fig-5 a: C-spine MRI axial view: the left C2/3 facet joint shows osteoarthritis and spinal stenosis, **b:** the C5/6 level shows a bulging disc with osteophytes and both foraminal stenosis

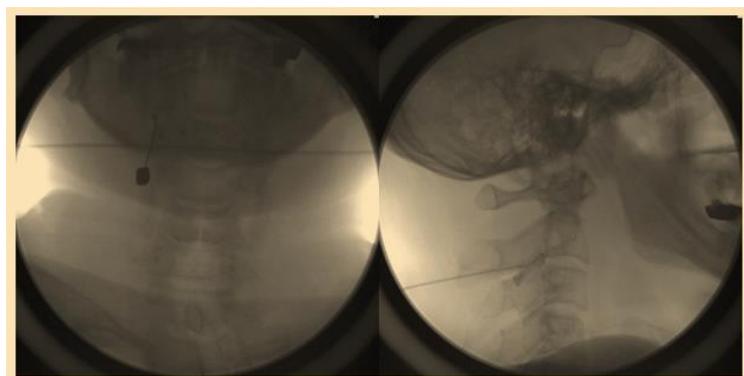


Fig-6 a, b: Left third occipital nerve block AP and lateral view

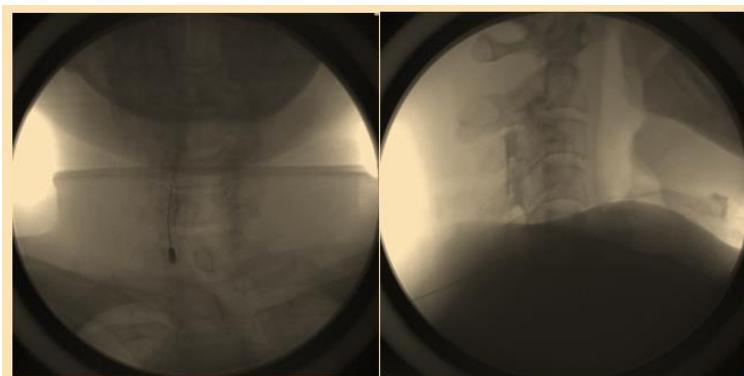


Fig-7 a, b: Cervical epidural block at the level of C 5/6 AP and lateral view

DISCUSSION

In this report, we discussed the cases of three patients who had symptoms that were in line with CHISG criteria: precipitation of head pain by neck movement; restriction of the range of motion; ipsilateral neck, shoulder, and arm pain; transient or long-lasting relief by diagnostic blockades; and unilaterality of the head pain without side-shift. However, the first patient did not meet one of the ICHD-3 beta criteria.

Sjaastad's criteria for diagnosis of CGH[3] is as follows: "(a) Precipitation of head pain, similar to the usually occurring one: by neck movement and/or sustained awkward head positioning, and/or: by external

pressure over the upper cervical or occipital region on the symptomatic side (b) restriction of the range of motion (ROM) in the neck, (c) ipsilateral neck, shoulder, or arm pain of a rather vague nonradicular nature or occasionally, arm pain of a radicular nature. The other points are diagnostic anesthetic blockades and unilaterality of the head pain, without sideshift.

The criteria for CGH have been described in section 11.2.1 in ICHD-3 beta [4]. In contrast to the CHISG, CGH first requires the presence of a lesion in the neck, headache showing a temporal relationship with the lesion, and an improvement in the headache with the disappearance of the lesion. In addition, the

patient should show cervical limitation of movement and provocative factors that can worsen the symptoms. Next, the headache should resolve with diagnostic nerve blocks. The ICHD-beta “comments” add that “side-locked pain,” “provocation of typical headache by digital pressure on neck muscles and by head movement,” and “posterior-to-anterior radiation of pain” are the other features that distinguish CGH from migraine and tension-type headache even though they are not unique to CGH. The description adds that CGH can also present with “migrainous features such as nausea, vomiting and photo/phonophobia” to a lesser degree compared to migraine and that the lesions in the neck can be “tumors, fractures, infections and rheumatoid arthritis of the upper cervical spine, cervical spondylosis and osteochondritis, depending on the individual cases.” In the first case in our series, the patient did not undergo any radiologic examination because her pain relieved completely after the procedures, so the causative lesion was not identified. However, the patient’s symptoms and signs were consistent with CGH. The other two patients had causative lesions that were shown by CT or MRI.

There are some headaches that should be differentiated from CGH. Tension-type headaches can present with tenderness in the neck and cervical area, which can also be present in CGH. However, tension-type headaches are usually bilateral and show no migrainous symptoms [1]. Cluster headaches can occur unilaterally but usually appear with accompanying symptoms such as ipsilateral lacrimation. Migraine also can present with unilateral headache in the occipital area spreading to the trigeminal part. However, it can be distinguished by the lack of persistency and the absence of provocative factors such as neck movement. Diagnostic nerve blocks, which may be used as a diagnostic tool for CGH, can also relieve migrainous and cluster headaches [1]. Therefore, symptom improvement with diagnostic nerve blocks alone should be interpreted cautiously. Occipital neuralgia presents with “paroxysmal stabbing pain in the neck that radiates over the cranium and tenderness over the nerve” [5]. It can be relieved temporarily by a diagnostic nerve block. However, it is a distinct condition in that occipital neuralgia is a neuralgic pain, whereas CGH is a referred pain from cervical structures.

Among the headaches mentioned above, occipital neuralgia is considered as the most difficult to differentiate. Diagnostic nerve blocks can be used as a differential tool because spinal procedures yield more lasting improvements in CGH, but exceptions to this rule may exist. As observed in the second case in our series, diagnostic nerve blocks may show only temporary effectiveness even in the CGH because of the deteriorating nature of the pain caused by progressive diseases such as rheumatoid arthritis. The author did not attempt spinal procedures for the second patient not only due to the patient’s refusal but also because of

these reasons. Occipital neuralgia shows typical signs such as “Tinel’s sign” and “pillow sign” [5]. Tinel’s sign is tenderness on palpation on the course of the greater and lesser occipital nerves, while the pillow sign refers to pain development when lying on pillow. These signs suggest that occipital neuralgia is attributable to nerve injury itself. However, these disease entities manifest on a spectrum with no clear-cut boundaries. Thus, there might some overlap between occipital neuralgia and CGH.

The literature recommends some treatment options for CGH. Physiotherapeutic methods such as manipulation or mobilization might be effective in the management of CGH but require more studies for confirmation [6, 7]. Greater occipital nerve blocks have been known to be used as diagnostic nerve blocks and may show long-term effects in some cases [8]. Radiofrequency (RF) ablation or pulsed radiofrequency (PRF) of the medial branches may be good candidates after double diagnostic blocks such as medial branch blocks and have been found to be effective for some periods [9]. However, there is still insufficient evidence to confirm the effectiveness of RF or PRF of nerves in CGH [10]. Cervical epidural steroid injections can be used with relative safety for CGH [11]. However, atlantooccipital or atlantoaxial joint blocks should be performed cautiously by skilled practitioners [9].

Referred pain from the neck to the head or frontal area was present in all cases. However, this presentation is not unique to CGH and is also observed in migraine and occipital headache. This overlap can be attributed to the anatomical basis i.e., the trigemino-cervical nucleus [10]. This anatomical convergence of pain fibers from the trigeminal nerve and the upper cervical nerves is well known. Therefore, as in CGH, lesions in the upper cervical structure can cause referral pain on the frontal area.

The pain generators in the cervical spine in CGH are primarily the C2-C3 and C3-C4 joints, atlantoaxial joint, C2-C3 intervertebral disk, and the atlantooccipital joint, which are innervated by the C1, 2, and 3 nerves [10]. Therefore, upper cervical procedures are considered initially for such cases. However, atlantooccipital joint injections can be dangerous due to their proximity to major neurovascular structures. Therefore, as in the first and third cases, the author chose more effective and less risky procedures such as a C2 ganglion block and a third occipital nerve block empirically.

CONCLUSION

In conclusion, CGH can be diagnosed easily if the headache is known to originate from the cervical area, thereby avoiding the need for unnecessary, expensive diagnostic examinations. Cervical spinal examination can be performed instead. A diagnostic nerve block should be attempted initially, and if the

peripheral nerve block does not provide long-term relief, upper cervical spinal blocks can be tried. If the latter also provides temporary relief, the block can be reattempted. However, if repeated upper cervical spinal blocks do not provide long-term relief, RF or PRF procedures should be considered.

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