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Cervicogenic Headache: Evidence That the Neck is a Pain Generator

Werner J. Becker, MD

This review was developed as part of a debate, and takes the “pro” stance that abnormalities of structures in the neck can be a significant source of headache. The argument for this is developed from a review of the medical literature, and is made in 5 steps. It is clear that the cervical region contains many pain-sensitive structures, and that these are prone to injury. The anatomical and physiological mechanisms are in place to allow referral of pain to the head including frontal head regions and even the orbit in patients with pain originating from many of these neck structures. Clinical studies have shown that pain from cervical spine structures can in fact be referred to the head. Finally, clinical treatment trials involving patients with proven painful disorders of upper cervical zygapophysial joints have shown significant headache relief with treatment directed at cervical pain generators. In conclusion, painful disorders of the neck can give rise to headache, and the challenge is to identify these patients and treat them successfully.

Key words: cervicogenic, headache, whiplash, facet joint, zygapophysial joint, medial branch block

Headache related to cervical spine disorders (cervicogenic headache and chronic headache attributed to whiplash injury) remains one of the most controversial areas of headache medicine. Nevertheless, a subpopulation of individuals with headache does fall into this category with clinical features which, at least in patient groups, can be differentiated from the much more common migraine and tension-type headache syndromes.¹ Although the concept of headaches originating from the cervical spine was described as early as 1860,² and the term “cervicogenic headache” was coined over 2 decades ago in 1983,³ a firm clinical diagnostic paradigm that most clinicians can use with confidence is still lacking. There are several reasons for this, including the overlap in symptomatology between migraine and cervicogenic headache, and the lack of an easily applied “gold standard” for cervicogenic headache diagnosis. Even cervical facet blocks, which might be considered a gold standard by some, are technically demanding, invasive, and assess only some of the potentially painful structures in the neck.

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Headache

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DIAGNOSIS

According to Bogduk,⁴ the singular defining criterion for cervicogenic headache is that it is pain perceived in the head but whose source lies in the cervical spine. The diagnosis of cervicogenic headache therefore relies on establishing a source for the pain in the neck, using reliable and valid diagnostic techniques. Cervicogenic headache can be difficult to diagnose clinically because these headaches share many features in common with other forms of headache. This makes it problematic to define cervicogenic headache in terms of pain location, pain quality, periodicity, or associated features. Medical imaging is also not usually helpful in localizing the source of pain. According to Bogduk, physical examination is not sufficiently reliable to definitively diagnose cervicogenic headache, and controlled diagnostic blocks of putative sources of pain in the neck are the only secure means of determining the source of pain in suspected cases of cervicogenic headache.⁴ Nevertheless, useful clinical clues are available to determine whether the patient’s headaches are of cervicogenic origin or not. For example, in patients with headache after whiplash injury, the chances of the headache being related to a dysfunctional C2-C3 zygapophysial joint are high if headache is the patient’s predominant pain complaint, and if there is also tenderness over the C2-C3 zygapophysial (facet) joint.⁵

Cervicogenic Headache International Study Group (CHISG) Diagnostic Criteria

Diagnostic criteria for cervicogenic headache have been developed^{6,7} by the CHISG. In essence, these include: (1) unilaterality of pain, although it is recognized that bilateral cervicogenic headache may occur; (2) restriction in range of motion in the neck; (3) provocation of usual head pain by neck movement or sustained awkward neck positions; (4) provocation of usual head pain with external pressure over the upper cervical or occipital region on the symptomatic side; (5) ipsilateral neck, shoulder, or arm pain, usually of a vague nonradicular nature, occasionally radicular.⁷ In the most recent version of these diagnostic criteria, confirmatory local anesthetic blocks in the cervical region are also considered necessary to make a firm diagnosis of cervicogenic headache.⁷ In addition, patients should have had at best only a marginal response to ergotamines, triptans, or indomethacin.⁷ Another feature, posterior onset of the headache pain, also seems

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Conflict of Interest: None

Table 1.—Cervicogenic Headache: Minimum Requirements for Diagnosis†

Precipitation of attacks by neck movements or sustained awkward positioning
 Or
 By external pressure over the upper cervical or occipital region on the affected side
 Positive result to anesthetic blockade
 Unilaterality without side shift‡

†The Cervicogenic Headache International Study Group.⁷

‡The requirement for unilateral headache can be waived in clinical work, although the validity of the diagnosis may be reduced.⁷ See also text.

to be an important feature of cervicogenic headaches.⁸ The minimal requirements for the diagnosis are shown in Table 1.

These diagnostic criteria insist on appropriate responses to local anesthetic blockade, and so cannot be considered clinical criteria which can be quickly applied in the practitioner's office. In addition, even some of the core clinical criteria are very much open to interpretation. For example, one of the core clinical features listed in Table 1, unilateral pain, is clearly not fundamental in that if pathology can happen on one side of the neck to cause headache, it could obviously in some individuals be present of both sides. This has been recognized by Sjaastad, the senior author of the diagnostic criteria.⁹ Sjaastad also has explained that in cervicogenic headache, a strict unilaterality of the pain is rare. Although the pain may be strictly unilateral when the headache is mild, when the headache becomes severe, there is often some spread to the contralateral side, although it is felt there to a lesser extent. The important feature is that it never dominates on the contralateral side.¹⁰ The clinical portion of the diagnostic criteria of the CHISG applied without the use of diagnostic local anesthetic blocks has been subjected to tests of interobserver reliability and appears to show similar reliability to the International Headache Society (IHS) diagnostic criteria for migraine and tension-type headache.¹¹ In this study, unilateral headache was considered an essential diagnostic criterion, so patients with bilateral neck pathology and bilateral headache would not have been included.

IHS Diagnostic Criteria

The International Classification of Headache Disorders¹² of the IHS, although helpful, also does not allow a definitive diagnosis of cervicogenic headache by clinical means in the physician's office. These criteria point out that cervicogenic headache is headache referred from a source in the neck. There must be clinical, laboratory, or imaging evidence of a disorder within the cervical region known to be a valid cause of headache. Common pathologies such as spondylosis and myofascial tender spots are

not recognized as valid causes of cervicogenic headache. Patients where myofascial tender points are considered to be the cause of the headache are to be classified as tension-type headache with pericranial tenderness. Also needed to satisfy the criteria is evidence that the pain can be attributed to the neck disorder, either through clinical signs or diagnostic local anesthetic blocks. Unfortunately, no clinical signs (such as neck pain, focal neck tenderness, mechanical exacerbation of pain, reduced range of motion in the neck, etc.) are considered to have been validated as acceptable evidence to fulfill this part of the diagnostic criteria for cervicogenic headache. It is acknowledged that these may be features of patients with cervicogenic headache, but as no clinical features are considered validated, this criterion cannot actually be used. Therefore, for these diagnostic criteria, local anesthetic blocks are necessary. The criteria for a positive response to these blocks are stringent: pain must be reduced by 90% or more, and suitable control injections must be used. Finally, necessary for the diagnosis is that the pain resolves within 3 months of successful treatment of the lesion (Table 2). These criteria are therefore very demanding, require the use of local anesthetic blocks as no valid clinical signs have been defined, and if interpreted literally are unlikely to be successfully applied to many patients in routine clinical practice.

In a sense, the IHS diagnostic criteria for cervicogenic headache might be considered transitional, in that it is to be hoped that some of the clinical symptoms and signs which might indicate the presence of cervicogenic headache will eventually be validated and be found sufficient to make the diagnosis in the proper clinical setting. However, given the high prevalence of migraine in the population and the frequency of neck injury, this area may always remain a clinically challenging one.

Table 2.—Cervicogenic Headache: International Headache Society Diagnostic Criteria¹²

- A. Pain referred from a source in the neck, but perceived in the head and/or face, fulfilling criteria C and D.
- B. Clinical, laboratory, and/or imaging evidence of a disorder or lesion in the cervical region accepted as a valid cause of headache†.
- C. Evidence that the neck problem is causing the pain, based upon
 1. Clinical signs that implicate a source of pain in the neck‡
 - And/or
 2. Abolition of headache by diagnostic (local anesthetic) blockade§.
- D. Pain resolves within 3 months after successful treatment of the cervical lesion/disorder.

†Tumors, fractures, infections, and rheumatoid arthritis of the upper cervical spine are accepted; cervical spondylosis and myofascial tender points are not considered valid causes for these criteria.

‡No clinical signs are considered validated at present.

§There must be at least a 90% reduction in pain, and placebo or other adequate controls should be used.

With regard to the facet joint anesthetic blocks and medial branch blocks that are currently used to establish a diagnosis of cervicogenic headache, it could be argued that even these might be nonspecific. Support for this argument would come from observations that occipital nerve blocks may temporarily relieve many different headache types including migraine. However, it would seem unlikely that the facet joints and the very small nerves blocked in the investigation of cervicogenic headache would reduce overall neural inputs to the trigeminocervical nucleus enough to cause the nonspecific effects seen when large nerves like the greater occipital nerve are blocked. However, when multiple facet joints are blocked simultaneously, it is possible that such nonspecific effects could emerge.

In contrast to how they define cervicogenic headache, the International Classification of Headache Disorders diagnostic criteria for chronic headache attributed to whiplash injury, another category of headache related to cervical spine structures, are much more flexible.¹² All that is required for this diagnosis is that the patients suffer a whiplash type of injury with neck pain at that time, that the headache develops within 7 days of the injury, and that the headache persists for at least 3 months. The headache itself need have no special clinical features, and no specific physical signs need be present. These diagnostic criteria are therefore somewhat nonspecific, and rely entirely on the temporal relationship between the trauma and headache onset. Furthermore, many of these patients will have preexisting primary headache types given the high prevalence of these headaches in the general population. The whiplash injury may in these cases cause exacerbation of these primary headache types to varying degrees, or coexist with them. A detailed study of a small group of patients appeared to confirm the presence of both migraine without aura attacks and cervicogenic headache attacks in the same patients.¹³ In my view, chronic headache attributed to whiplash injury should be considered a subtype of cervicogenic headache.

Despite great efforts therefore a good clinical schema to diagnose headache resulting from disorders of the cervical spine remains elusive, and specialized local anesthetic blocks are needed for definitive diagnosis. Although chronic headache attributed to whiplash injury is defined by purely clinical criteria, even here local anesthetic blocks may be required to localize the pain generator further if invasive treatments are to be applied. Given the complexity of the cervical region and the many pain-sensitive structures in this area, it is likely that currently used blocks which usually assess primarily the zygapophysial joints significantly under diagnose cervicogenic headache. They may also be misleading because in a given patient a number of structures may be injured or affected in some way. This situation is particularly unfortunate in that cervicogenic headache disorders are likely not rare and cause significant disability. Making the diagnosis of cervicogenic headache remains problematic and cervicogenic headache remains a controversial topic.

PREVALENCE

It seems clear that damage or injury to neck structures can result in headache, but it remains unclear how common this syndrome is. When the diagnosis was based on clinical features rather than specific cervical nerve or facet joint blocks, a lifetime prevalence of 4.1% was found in a population-based study.¹⁸ In a referral clinic-based study, using the third occipital nerve blocks in “post whiplash” patients whose predominant pain complaint was headache (as opposed to neck pain), it was found that at least 53% of patients had headache originating from the C2-C3 zygapophysial joint alone.⁵

After whiplash injury, one study found that 15.2% of patients complained of headache lasting longer than 42 days after injury, and 4.6% developed chronic daily headache.¹⁴ Drottning found that 3% of patients who sought medical attention after whiplash injury had cervicogenic headache at 1 year post injury, and 25% of these had headache on more than 15 days a month.¹⁵ At 6 years post injury, 35% of patients with cervicogenic headache at 1 year still had cervicogenic headaches.¹⁶ It has been reported that 2% of patients are permanently disabled after whiplash injury.¹⁷

REASONS FOR CONTROVERSY

Cervicogenic headache remains a controversial topic for a number of reasons. (1) Neurologists are the specialist to whom headache patients are referred to most often, and neurologists are often not expert in the examination of the neck. (2) Cervicogenic headache is relatively uncommon compared with migraine and tension-type headache, and shares a number of clinical features with migraine. (3) Patients with a history of migraine or a genetic tendency for migraine may be especially prone to developing cervicogenic headache. This results in a complex clinical picture which may make diagnosis difficult. (4) The expertise to do the diagnostic blocks well that are needed to definitively confirm a diagnosis of headache related to a facet joint may not be available in all centers. (5) In many countries, medicolegal factors may cloud some of the issues, particularly when it comes to chronic headache attributed to whiplash injury.

The overlap in clinical features between cervicogenic headache and migraine has added to the controversy. Many migraine sufferers report neck discomfort and stiffness during an attack, likely related to pain referral from the head to the neck. Patients with both headache types may report unilateral headache. However, careful clinical studies have suggested that it is possible to discriminate between these 2 headache types. Features which tended to discriminate between them were the much higher prevalence of limitation of neck movement, shoulder and arm discomfort, pain provocation from neck movements, and posterior onset of head pain in patients with cervicogenic headache.¹ Using current diagnostic criteria, unilaterality was also much more common in cervicogenic headache, perhaps by definition. Unilaterality is also one of the diagnostic criteria for migraine, but not a mandatory one. It has also been reported, although based on quite a small

patient sample, that in contrast to migraine, pregnancy has little or no ameliorating effect on cervicogenic headache.¹⁸

For some patients with a migraine tendency, it seems likely, based upon clinical experience, that nociceptive inputs from the neck can trigger migraine attacks. Most clinicians who see significant numbers of patients with headache will have encountered patients who develop typical migraine attacks for the first time after a head or neck trauma. While this may be due to coincidence, a causative relationship seems likely. Patients may therefore have both typical migraine attacks, and in addition a longer lasting more continuous cervicogenic headache of lesser intensity and with less or no photophobia and nausea. Such patients can present diagnostic and therapeutic challenges, and patient application of the clinical diagnostic criteria for each headache type is usually helpful, as long as it is recognized that the 2 headache types may co-exist. With regard to investigation and treatment, it seems prudent to use less invasive procedures and therapies first, and reserve invasive testing and treatments for those in whom a reasonably satisfactory response is not obtained.

PATHOPHYSIOLOGY

The Cervical Region Has Many Potentially Painful Structures and These Are Prone to Injury

There are many potentially painful structures in the neck which have a rich nociceptive innervation. These include the zygapophysial joints, the intervertebral discs, the ligaments and muscles, and the skin. Of these, the zygapophysial joints appear to be the most important pain generators. Certainly for neck pain, clinical studies have established that the zygapophysial joints are the single most common source of pain after whiplash injuries, and account for at least 50% of cases. For other patients, the biomechanical data suggest that injury to the intervertebral disc may be a source of the pain.¹⁹ The weight of the head and the design of the neck for maximum mobility likely play a role in the susceptibility of the cervical spine to injury. The extremely high prevalence of degenerative changes in the cervical spine, even in younger individuals, although apparently often without associated pain, underscores the stresses placed upon this structure.

Although the zygapophysial joints appear to be the most common source of pain in the neck which may radiate to the head, physical examination has been disappointing in its ability to determine whether a specific zygapophysial joint is a source of pain or not. Manual examination has been shown to have a high sensitivity for the detection of zygapophysial joint pain, but a low specificity. It is therefore not a valid test for whether a joint may be a pain generator, as it cannot discriminate accurately between the presence and absence of zygapophysial joint pain.²⁰

The Anatomical and Physiological Mechanisms Are in Place to Refer Pain from the Neck to the Head

Pain referral to the head from these cervical structures occurs because nociceptive afferents in the trigeminal nerve including

those from the supratentorial dura synapse to some degree on the same second order sensory neurons in the trigeminal nucleus caudalis as nociceptive afferents from cervical structures. The trigeminal nucleus caudalis is continuous longitudinally with the dorsal horns of the upper 3 or 4 segments of the cervical spinal cord. This column of gray matter has been named the trigeminocervical nucleus or complex to reflect this.²¹ Anatomically, it has been shown that the trigeminocervical nucleus extends caudally down to the C2-C3 level in the monkey.²² The anatomical convergence of pain fibers from the trigeminal nerve including the ophthalmic division of this nerve and from the upper cervical nerves is the basis for the referral of pain from the upper cervical region to the head, including frontal head regions.

Physiologically, it has been confirmed that for neurons in the trigeminocervical nucleus that receive both dural and occipital afferents, stimulation of the greater occipital nerve will result in increased excitability to dural inputs.²³ Likewise, stimulation of dural mater also leads to sensitization of the second order sensory neurons so that they are now more easily activated by neck muscle and greater occipital nerve stimulation.²⁴

In both the trigeminal and cervical nerves, there is convergence of inputs of afferent nerve fibers from deeper structures and more superficial structures, allowing for the referral of pain to various parts of the head and neck from both the dura and deeper neck structures.^{23,24} These anatomical and physiological findings clearly show that the stage is set for nociceptive inputs from the neck to cause headache, and also for nociceptive inputs from the dura to potentiate neck pain.

CLINICAL STUDIES

Clinical Studies Have Shown That Pain from Cervical Spine Structures Can Be Referred to the Head

It is clear that painful stimuli from the upper cervical segments can be referred to the head. Especially instructive in this regard are the experiments of Piovesan et al,²⁵ which involved 3 subjects with right side-locked migraine attacks. Injection of sterile water over the greater occipital nerve in the neck on the right side produced not only local occipital pain but also more severe pain in the territory of the ophthalmic division of the trigeminal nerve. Of interest, the location of pain produced by the injection varied from patient to patient. One subject experienced only pain limited to the occipital region. Another had pain also in the supraorbital region, while the third subject not only had referred pain to the forehead and supraorbital region, but also experienced pain in the eyeball itself. Clearly, then, painful stimuli carried by the upper cervical nerves (in this case C2) can result in referred pain to the forehead and eye, at least in patients with underlying migraine.

An exhaustive study of almost 200 patients which used cervical nerve blocks to determine if patients had pain arising from 1 or more cervical zygapophysial joints delineated various pain pat-

terns which were produced by the cervical zygapophysial joints.²⁶ Importantly, the C1-2, the C2-3, and the C3-4 joints could refer pain to the vertex and the front of the head. All also caused pain in the neck and occipital region. C1-2 and C2-3 could refer pain to the orbit; C3-4 did not. Also important, the patterns of pain referral of the following zygapophysial joints did not involve the head: C4-5, C5-6, and C6-7. The pain of C1-2 and C2-3 occurred predominantly in the head, although it could spread caudally into the neck. Thus, it seems clear that the zygapophysial joints from C2-3 to C3-4 can produce vertex and anterior head pain, and must be considered in the differential diagnosis of frontal headache.

There are many potentially painful structures in the neck in addition to the zygapophysial joints. There is evidence that at least some of these can mediate headache even from the lower cervical segments. A study of 275 patients with clinical and radiological evidence of cervical nerve root compression found that over half (161 patients) had significant complaints of headache in addition to their radicular pain in the arm.²⁷ Over 80% of these patients had involvement of the C6 and C7 nerve roots, as opposed to the higher cervical nerve roots. With selective local anesthetic nerve blocks of the involved nerve roots, 41% of patients with headache reported total relief, and an additional 20% reported greater than 50% relief of headache 30 minutes after the block. It would appear therefore that pathology at lower cervical levels can give rise to headache, and although the patients in the study cited above experienced headache in the back of the head, it was also often described as radiating to the forehead. It is possible that the headache was of some other causation, and that the selective nerve blocks simply removed a major nociceptive input into the cervical region. In this manner, they might have indirectly relieved the patient's headache by bringing the regional pain system below threshold. It is also possible that the radicular pathology at lower cervical levels produced the headaches indirectly by causing excessive muscle tension at higher cervical levels, and this in turn produced the headache through myofascial mechanisms. In support of this, all patients with headache in this study were found to have tenderness on external pressure, most frequently in the medial portion of the trapezius muscle on the affected side. It would appear more likely, however, that major nociceptive inputs even from the C6 and C7 levels can in some patients facilitate the pain pathways sufficiently at higher cervical levels so that headache is experienced, perhaps in response to inputs from minor pathology at these higher levels which would normally have remained below threshold for pain perception. Consistent with this hypothesis, the headache was usually described by the patients in the study as aching and tightening, and was experienced predominantly on the side of the spinal nerve root pathology.²⁷ Of interest, patients with headache also reported more severe pain in the neck, shoulder, and arm than patients without headache. This might indicate that pathology in the distribution of the lower cervical nerve roots is likely

to result in headache only if the nociceptive inputs from these levels are severe. Improvement of headache after surgery directed at the lower cervical roots for cervicobrachialgia has also been reported.^{28,29} Improvement of cervicogenic headache after disc surgery at the lower cervical levels (C4-5, C5-6, C6-7) has been reported specifically for both unilateral headache³⁰ and bilateral headache.⁹

Although the anatomical mechanisms may be in place to refer pain from the neck to the frontal head regions, the ease with which this occurs may differ from one individual to another. It may be that a pain system already sensitized by migraine or by a chronic cervical spine pain source is necessary for referral of pain to frontal head regions in many individuals, or perhaps unusually intense pain inputs from the cervical spine are necessary. For example, a patient with a cervical facet joint injury may have headache which is usually confined to the occipital region, but which radiates to the forehead and orbit only when the pain is exceptionally severe. Studies in normal individuals with painful stimuli applied to neck structures may not always reveal the full extent of the potential pain radiation pattern²⁶ because the stimulus is not severe and/or the individual's pain system is not sensitized by chronic pain.

LONG-TERM RELIEF OF HEADACHE FROM TREATMENT DIRECTED AT CERVICAL PAIN GENERATORS

Treatment Directed at Cervical Pain Generators Has Produced Significant Headache Relief in Patients with Headache Related to Cervical Spine Pathology

Long-term headache response to treatment directed at putative cervical pain generators would support the hypothesis that cervical structures can cause headache. For neck pain, it has been clearly shown through a gold standard randomized double-blind placebo-controlled trial that appropriately targeted neurotomy procedures can produce long-term pain relief. In 1996, Bogduk et al³¹ performed such a trial. In all patients, the zygapophysial joint responsible for the neck pain had been determined with differential nerve blocks which included a saline control. Twelve patients were randomized to each group. Patients in one group received radiofrequency neurotomy and the other group received an identical but sham procedure in that the thermo coagulating current was not turned on. At 27 weeks, 1 patient in the control group and 7 in the active treatment group remained free of pain. The median time to the return of at least 50% of the preoperative pain level was 263 days in the active treatment group, and 8 days in the control group.

This study confirmed the short-term data from cervical nerve or facet blocks that neck pain can be relieved by procedures directed at the zygapophysial joint.

With regard to headache, several open label trials have indicated that similar outcomes are possible. Govind et al³² found

that in appropriate patients radio frequency neurotomy of the third occipital nerve (the branch of C3 which innervated the C2-C3 facet joint) resulted in complete pain relief for at least 90 days in 88% of 49 patients. The median duration of the pain relief in these patients was 297 days post procedure. Once the pain returned, most patients could again achieve pain relief through a repeat procedure. Other investigators have also reported success with radio frequency neurotomy in cervicogenic headache.^{33,34} Two randomized studies have not shown positive outcomes with cervical nerve ablation procedures.^{35,36} While this could be considered evidence against the hypothesis that the neck can be a source of headache, both studies had very significant methodological limitations. The only randomized double blind sham-controlled study³⁵ was very small in that only 12 patients were randomized. The conclusions from this study must therefore be considered at best tentative, and in fact a trend toward greater improvement in the treatment group is evident in the data presented. The methodology of this study has been severely criticized.³⁷ The other randomized controlled study was not sham-controlled and was single-blind.³⁶ Although larger, it was still relatively small with only 30 patients randomized. In this study, only 3 patients had nerve ablation procedures at the C-3 level or above. This is problematic in that among the zygapophysial joints which are easily accessed for medial branch blocks the joints at the C2-C3 level (innervated by the third cervical nerve) are the ones which most frequently refer pain to the head. Patients with whiplash injuries were also excluded from the study. For these and other reasons therefore the results of this study can also not be considered definitive in terms of evidence for or against whether cervical spine pain generators can be responsible for headache. Patient selection and technical considerations appear to be critical for success from nerve ablation procedures, and these may need to be clarified further before widespread success in the use of these procedures is possible.

CONCLUSIONS

Headache related to pain generators in the upper cervical region exists, and is an important clinical entity. Its existence should not seem surprising, given that the upper neck has many pain-sensitive structures, and that the innervation of these structures is such that pain referral from these structures, even to the orbit, is possible. The probable role of muscular problems in the neck should also not be underestimated. Although the IHS Classification recommends classifying patients with headache who show myofascial tender points in the neck under the tension-type headache categories,¹² others have stressed the importance of myofascial trigger points in the neck as sources for headache,³⁸ and consideration might be given to including at least those patients with true trigger points in the cervicogenic category. The importance of examining the soft tissues of the neck has also been emphasized by others.³⁹

That the joints of the neck should be a major player in cervicogenic headache should not be surprising, as joints are common sources of pain elsewhere in the body. The joints of the neck are weight bearing joints, and given the weight of the head, might be expected to be injured both as a result of “normal” activities, and also as a result of the high velocity injuries which occur today and for which the neck was never prepared by evolutionary forces. Cervicogenic headaches are not as common as migraine and tension-type headaches, but the disability that they cause is significant, and it is important that all neurologists and other headache specialists become familiar with their diagnosis and treatment. To do this, we must collaborate with our colleagues in other specialties, as cervical nerve blocks and neurotomies are an integral part of cervicogenic headache diagnosis and therapy.

Although some authors have put much emphasis on the zygapophysial joints as pain generators, other structures in the upper cervical spine, for example the intervertebral discs, may be responsible for some cases.⁴ These other structures may be less amenable to diagnostic anesthetic blocks. In addition, it might be expected that cervical spine joints above those that are commonly blocked could be pain generators for headache, and indeed it has been shown on the basis of local anesthetic blocks that the atlanto-axial joints can refer pain to the frontal head region and orbit.⁴⁰ It might be expected that dysfunction of the joints between the atlas and the skull itself could also generate headache. The upper cervical spine is a complicated structure, and diagnostic blocks require skill and precision. Diagnostic blocks are invasive procedures, and placebo responses also need to be considered. As a result, this is still an evolving field, and the current use of even the best studied test, the medial branch block, as a diagnostic gold standard has been questioned.⁴¹ We owe it to our patients to carry out more careful studies to bring clarity to this difficult headache syndrome.

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