# Clinical Assessment of Patients with Cervicogenic Headache: A Preliminary Study

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**Background:** The traditional diagnostic criteria of cervicogenic headache (CEH) are mainly subjective symptoms, thus making its differential diagnosis difficult. This study aimed to evaluate the diagnostic validity of functional plain radiograms, based on the clinical diagnostic criteria of CEH.

**Methods:** Twenty-two patients with subjectively diagnosed cervicogenic headache, including 7 with a traceable history of neck trauma, and 14 healthy subjects as controls from rehabilitation clinics were evaluated. All of them received plain cervical radiographic examination, including lateral views in the flexion, neutral, and extension positions. The degree of localized kinking was measured to define the level of cervical malalignment. Subjective symptoms elicited by a questionnaire were categorized by involved regions.

**Results:** The numbers of localized kinking segments in the lower cervical spine were significantly different between the study and control groups ($p < 0.05$). The study group had more involved segments than the control group. On the questionnaire, clinical symptoms involving the nasal regions were one of the most common clinical manifestations (36.4%) among cephalic syndrome.

**Conclusions:** For cervicogenic headache, functional plain radiogram may help in clinical diagnosis. Abnormal nociceptive afferents due to malalignment may be responsible for the nasal symptoms.

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**Key words: cervicogenic headache, localized kinking, functional plain radiogram**

Headaches after cranio-cervical injury are common in rehabilitation clinics. The majority of studies report that cervicogenic headache (CEH) is one of most common types of headaches in patients following cranio-cervical trauma.[1,2] Patients with chronic headache after cranio-cervical trauma demonstrate substantial declines in quality of life measurements and cervicogenic headaches demonstrate the greatest loss in domains of physical functioning when compared with other types of headaches.[3,4]

Sjaastad et al. first introduced the term cervicogenic headache in 1983. Since then, the International Headache Society (IHS) has identified it as a distinct sub-group.[5-7] However, the diagnostic criteria are mainly subjective symptoms, which makes the differential diagnosis difficult.[2,8] Diagnostic treatment with nerve block procedures is often impractical.[9-11]

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Routine radiographs of the cervical spine do not reveal any specific findings. Other examinations, including myelography, computed tomography (CT) and magnetic resonance imaging (MRI), are also ineffective for clinical diagnosis.[11-14]

IHS subjective classification criteria are commonly used to classify cervicogenic headache but fail to identify the segmental source of pain, which is important for treatment.[11-13] Lew et al. reported that cervicogenic headache involves peripheral mechanisms (i.e., musculoskeletal or biomechanical dysfunctions) and physical therapy can achieve better effects than nonsteroidal anti-inflammatory drugs.[2] Griffith et al. found that a functional plain radiogram can be a useful tool to define microtrauma and segmental instability of the cervical spine.[14-18] Although cervicogenic headache may occur even without trauma, microtrauma associated with biomechanical change may be evaluated by functional plain radiograms.[16,17]

In this preliminary study, measurements established by Griffith et al. were used to define segmental malalignment of the cervical spine in CEH patients.[18] This study aimed to evaluate the malalignment of the cervical spine in CEH using functional plain radiograms and to investigate the clinical manifestations in our patients.

## METHODS

### Subjects

Subjects were recruited from the rehabilitation clinics of Chang Gung Memorial Hospital in Taipei and Taoyuan, Taiwan. The inclusion criteria were based on the IHS subjective classification criteria for cervicogenic headache.[11-13] Patients with conditions that might contraindicate radiologic examination, as well as those with known autoimmune, neurologic, or infectious disorders, were excluded. Fourteen healthy subjects without any known neurologic or musculoskeletal impairment served as the control group. All of them were free of symptoms of cervicogenic headache according to IHS subjective classification criteria.

### Measurements

In addition to routine patient information, a questionnaire was used to document subjective features provided by the patients. A physiatrist recorded these subjective features, which were categorized by the involved regions, including cranial, upper trunk, and upper limb lesions (Fig. 1).

Each subject underwent a full cervical radiologic series, including lateral views in the neutral, flexion, and extension positions. Measurements for segmental malalignment were made on each pair of lateral radiographs. The definition published by Griffith et al. in 1995 was used to define segmental malalignment.[14-18] Abnormally wide fanning of the interspace between two adjacent spinous processes, or localized kinking in the alignment of two adjacent vertebral bodies was defined as an isolated indicator of malalignment.[8] To measure kinking, vertical lines were drawn along the posterior endplates of adjacent vertebral bodies and the angle subtended by these lines was measured in degrees. To measure fanning of the spinous processes, horizontal lines were drawn through each process and a perpendicular line was from the tip of the spinous process above to the line along the process below. The vertical distance was measured in millimeters and was used as the measure of fanning.

Since kinking nearly always corrected itself on extension views, it was measured only on flexion views (Fig. 2).[18] Moreover, plain radiograms of the lateral, neutral and extension views were evaluated by a blinded attending radiologist. Spondylolisthesis between two adjacent vertebral bodies was also defined as segmental malalignment (Fig. 3).

Initially, two physiatrists evaluated each plain radiogram of the flexion view. After repeated experiments, measurements of fanning were more time consuming and irreproducible. Hence, localized kinking was used to define malalignment.

### Reliability

To determine intra- and inter-examiner reliability of localized kinking measures, the radiograms of the first 10 subjects (5 each from the study and control groups) were gauged twice by both examiners, with a 1-week interval between each measurement.

### Data analysis

The chi-square test and independent sample t-test were used to compare differences between groups. Reliability between measures was assessed in terms of the intra-class correlation coefficient (ICC) using a 2-way mixed-effects model (ICC3,1)

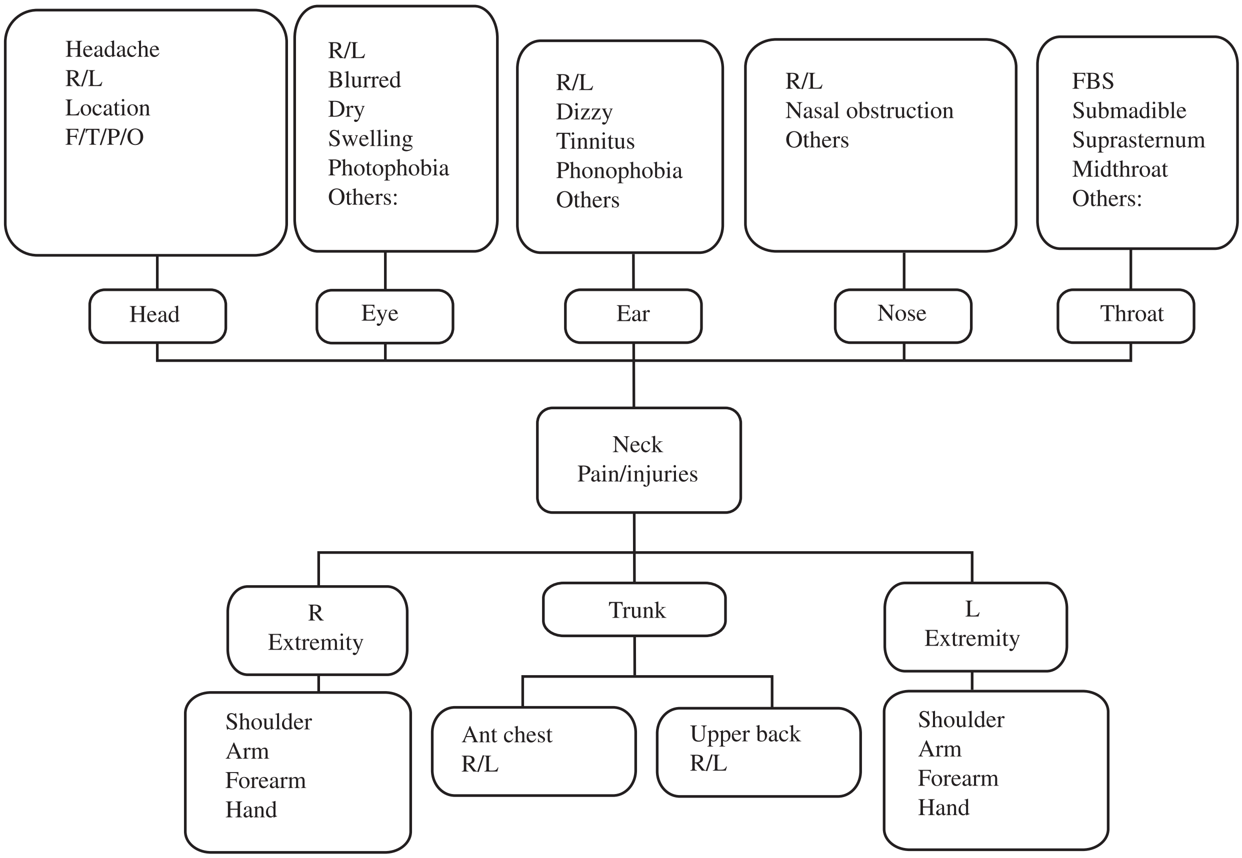


**Fig. 1** Questionnaire for clinical symptoms. Abbreviations used: R: right; L: left; F: frontal; T: temporal; P: parietal; O: occipital; FBS: foreign body sensation; Ant: anterior.

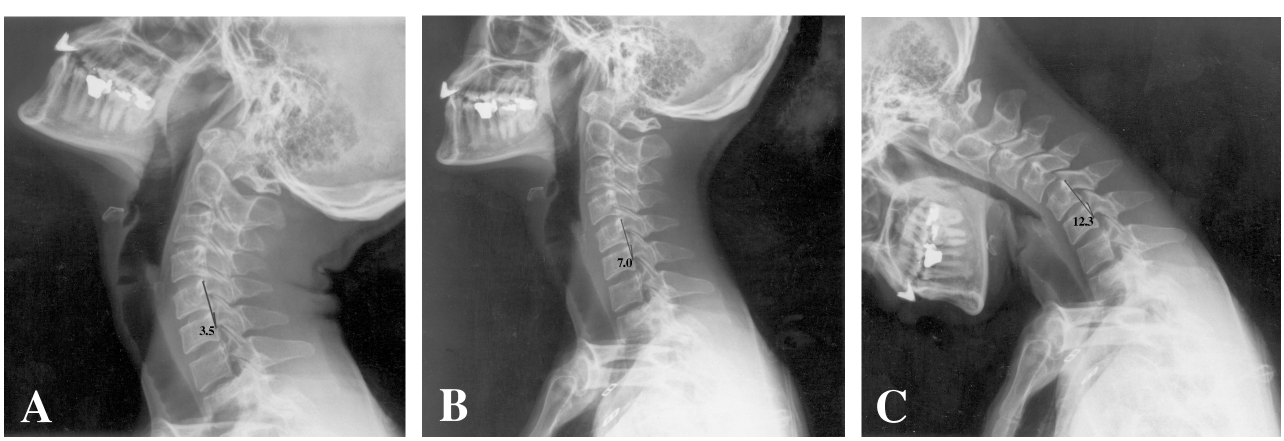


**Fig. 2** Measurements of localized kinking. Vertical lines were drawn along the posterior endplates of adjacent vertebral bodies and the angles subtended by these lines were measured in degrees (Note that the kinking corrected itself on extension views). In this 35-year-old woman with a cervicogenic headache and history of craniocervical trauma, the extension and neutral views (A and B) show no major abnormality (3.5° and 7.0°, respectively). However, the flexion view (C) shows significant kinking between C5 and C6 (12.3°).

A

B

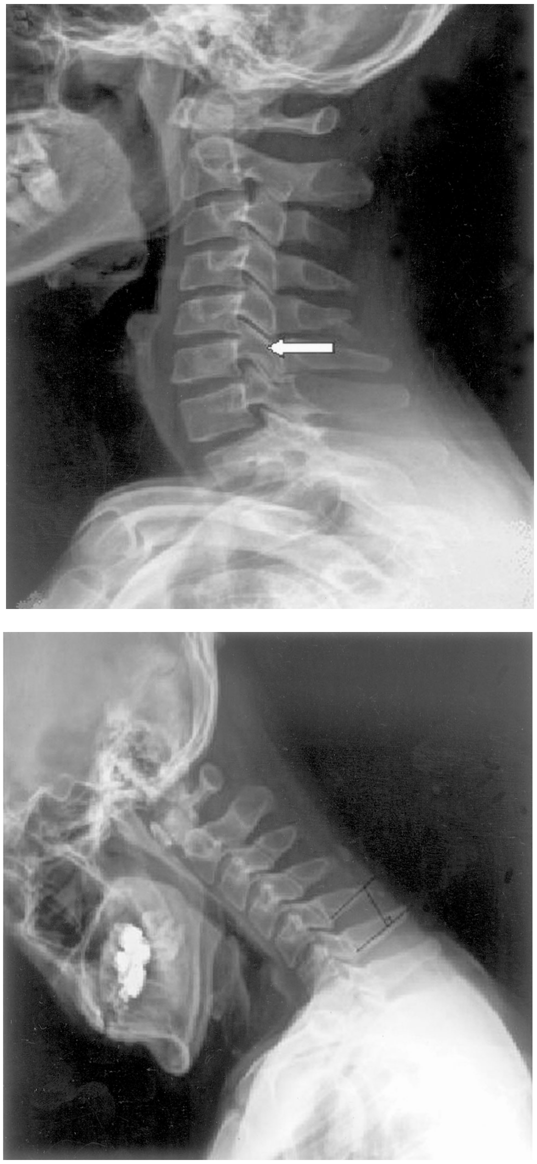

**Fig. 3** Spondylolisthesis and localized fanning measures. Spondylolisthesis between C5 and C6 was diagnosed by an attending radiologist (A). Techniques to measure fanning of the spinous processes included horizontal lines through each process and a perpendicular line from the tip of the spinous process to the line along the process below. The vertical distance (in mm) was obtained as the measure of fanning (B).

for intra-examiner assessments and a 2-way random-effects model (ICC2,k) for inter-examiner assessments. ICC values ranging from 0.81 to 1.0 indicate very good, 0.61–0.80 good, 0.41–0.60 moderate, 0.21–0.40 fair, and below 0.2 poor reliability.

## RESULTS

Twenty-two patients with cervicogenic headache (11 men, 11 women) were evaluated. Patient data did not differ between the CEH and control groups (Table 1). Seven CEH patients had a history of craniocervical trauma. The distribution of incident types included motor vehicle collisions (4 patients), falls (2 patients), and field- sports related trauma (1 patient). The duration of headache in the CEH group ranged from one to 11 years, with a mean duration of 5.0 ± 3.6 years, which indicated a chronic headache. The mean age, height, and body weight of the subjects are shown in Table 1.

Comparisons of segmental malalignment between the CEH and control groups are shown in Table 2. In CEH patients with and without trauma, the number of segments with localized kinking was significantly different from the control group in most of the cervical spines, except for C2/C3. There was no significant difference in spondylolisthesis between groups (Table 2).

Most patients in the CEH group had localized kinking in multiple segments. In the control group, all localized kinking was observed as single segment involvement (Table 3). Most segmental malalignment was between C4/C5 and C5/C6, the lower cervical spines. The ICC for inter-examiner reliability of localized kinking was 0.91 with a 95% confidence interval of 0.83-0.95, indicating very good reliability.

**Table 1.** Data of Cervicogenic-headache and Control Group Subjects and Clinical History of Cervicogenic-headache Group

| | CEH group | Control group | *p* value |
|---|---|---|---|
| Gender (male/female) | 11/11 | 7/7 | 0.633 |
| Age (years) | 8.8 ± 5.7 | 30.1 ± 6.1 | 0.617 |
| Body height (cm) | 167.7 ± 11.4 | 169.4 ± 5.6 | 0.617 |
| Body weight (kg) | 58.0 ± 10.9 | 63.8 ± 10.5 | 0.158 |
| Trauma history | 7/22 | | |
| Duration (years) | 5.0 ± 3.6 | | |

Data are given as mean ± SD.
**Abbreviation:** CEH: cervicogenic headache.

**Table 2.** Radiological Measurements of Localized Kinking and Spondylolisthesis

| Radiological findings | CEH with trauma | Control | *p* | CEH without trauma | Control | *p* |
|---|---|---|---|---|---|---|
| Localized kinking | | | | | | |
| C2/3 | 1 (14.3) | 0 (0) | 0.163 | 5 (33.3) | 0 (0) | 0.038* |
| C3/4 | 2 (28.6) | 0 (0) | 0.036* | 9 (60.0) | 0 (0) | 0.000* |
| C4/5 | 4 (57.1) | 2 (14.3) | 0.042* | 9 (60.0) | 2 (14.3) | 0.010* |
| C5/6 | 4 (57.1) | 0 (0) | 0.001* | 9 (60.0) | 0 (0) | 0.000* |
| C6/7 | 5 (71.4) | 0 (0) | 0.000* | 6 (40.0) | 0 (0) | 0.007* |
| Spondylolisthesis | | | | | | |
| C2/3 | 0 | 0 | | 0 | 0 | |
| C3/4 | 0 | 0 | | 0 | 0 | |
| C4/5 | 0 | 2 | | 1 | 2 | |
| C5/6 | 0 | 0 | | 1 | 0 | |
| C6/7 | 0 | 0 | 0.494 | 0 | 0 | 0.600 |

Values are expressed as n (%).
*: Significantly different between patients with CEH and control subjects ($p < 0.05$).

**Table 3.** Segmental Malalignment with Localized Kinking

| | CEH with trauma | Control | *p* | CEH without trauma | Control | *p* |
|---|---|---|---|---|---|---|
| No segment | 1 (14.3) | 12 (85.7) | 0.002* | 2 (13.3) | 12 (85.7) | 0.018* |
| 1 segment | 1 (14.3) | 2 (14.3) | 0.954 | 1 (6.7) | 2 (14.3) | 0.954 |
| 2 segments | 3 (42.9) | 0 (0) | 0.005* | 3 (20) | 0 (0) | 0.005* |
| 3 segments | 0 (0) | 0 (0) | | 5 (33.3) | 0 (0) | 0.000* |
| 4 segments | 1 (14.3) | 0 (0) | 0.147 | 4 (26.7) | 0 (0) | 0.000* |
| 5 segments | 1 (14.3) | 0 (0) | 0.147 | 0 (0) | 0 (0) | |
| Total | 7 | 14 | | 15 | 14 | |

Values are expressed as n (%).
*: Significantly different between patients with CEH and control subjects ($p < 0.05$).

Very good intra-examiner reliability was also found for the localized kinking measures. The ICC was 0.88 with a 95% confidence interval of 0.83-0.95.

Most subjective features on the questionnaire were found in the regions of the head, eyes, and ears. There was clinical involvement of the nose in 8 of the 22 CEH patients (Table 4).

## DISCUSSION

Biondi reported a prevalence of cervicogenic headache in the general population between 0.4% and 2.5%, but in pain clinics, the prevalence was as high as 20% in patients with chronic headache.[3] The mean age of cervicogenic headache patients was 42.9 years, and there was a four-fold higher predominance in women in various studies.[3,6-8] In our study, the mean age of the patients was lower than in previous reports and no female predominance was noted. These results may be limited by the sample size.

According to IHS diagnostic criteria, subjective symptoms are the main basis for diagnosis. Although associated manifestations, such as neck pain, focal neck tenderness, history of neck trauma, coexisting shoulder pain, nausea, vomiting, and photophobia are not unique to cervicogenic headache, the incidence of these clinical features was 4.5-68.2% in our study. The incidence of these associated symptoms was similar to those in previous reports.[11,19,20]

**Table 4.** Regions of Clinical Involvement

| | No. | Percentage (%) |
|---|---|---|
| Head | 22 | 100 |
| Cephalic syndrome | | |
| Eye | 14 | 63.6 |
| Ear | 15 | 68.2 |
| Nose | 8 | 36.4 |
| Throat | 8 | 36.4 |
| Trunk | 13 | 59.1 |
| Right upper limbs | 6 | 27.3 |
| Left upper limbs | 1 | 4.5 |

Fredriksen et al reported that the most common phenomena accompanying CEH were those involving the neck, eyes, and throat. Their reported incidences were 72.7%, 63.6%, and 54.5%, respectively.[19] Previous studies demonstrated incidences of photophobia and phonophobia in CEH patients between 33-36% and 33-91%, respectively.[20] Good treatment outcomes of these associated symptoms have been reported.[9,11,21]

In our study, the incidence of involvement of the right upper limbs was higher than that on the left side. This might be associated with more prolonged compressive loading on the dominant right upper limbs. During daily activity, the upper extremities transfer weight to the posterior cervical region through the attachments of the cervicoscapular muscles (levator scapulae and upper trapezius).[22,23] Johnson et al noted that the major function of the upper trapezius is to relieve compressive loads on the cervical spine by transferring weight on the upper extremity to the sternoclavicular joint.[24] This load bearing is considered to contribute to an increase in tissue stress in the posterior cervical region, and CEH symptoms.[25]

Clinical manifestations in the nose are autonomic symptoms.[26,27] The physiologic mechanism for cervicogenic headache is the convergence between trigeminal afferents and afferents from the upper three cervical spinal nerves. This convergence of nociceptive pathways allows for the referral of pain signals from the neck to the trigeminal sensory receptive fields of the face and head, as well as the sensorimotor fibers of the spinal accessory nerve (cranial nerve XI).[3] A previous study demonstrated that many autonomic symptoms associated with headache, such as nasal congestion, rhinorrhea, and lacrimation, are related to the release of both trigeminal and autonomic neuropeptides.[27] That is, it is trigeminal-autonomic activation, which is precipitated by nociperception in the craniocervical region through the trigeminal nerve, and then generates cranial autonomic features.[26] Malalignment occurring in the cervical spine may influence the nerve pathway, which is responsible for the autonomic symptoms.[3,28]

There are reports of cranial symptoms in Barre-Lieou syndrome, which is due to posterior cervical sympathetic nervous system dysfunction which can lead to many autonomic symptoms, including sinus congestion and lacrimation (tearing of the eyes).[29,30] Cervicogenic headache and its associated symptoms of nasal congestion can be relieved by great occipital blockage[9] Radanov et al. described a "cervicoencephalic syndrome" characterized by cervicogenic headache with cephalic symptoms, which shares the same mechanisms as cervicogenic headache.[31] In our study, nociception may have activated similar trigeminal afferent pathways and caused autonomic manifestations in the nasal region. Thus, nasal symptoms may be regarded as one of the diagnostic criteria, and "cervicogenic cephalic syndrome" may be used to combine all of these clinical manifestations.

In the IHS diagnostic criteria, a history of neck trauma is not necessary to establish the diagnosis of cervicogenic headache.[7,8] However, cervicogenic headache is often a sequela of craniocervical trauma or whiplash injury. A previous study demonstrated that a malalignment of the cervical spine causes headaches.[8,32] Malalignment of the cervical spine, which is not detected on a routine plain radiogram, can still lead to cervicogenic headache.[21,32] Imaging studies cannot provide a confirmatory diagnosis and are primarily used to search for suspected secondary causes.[7] Localized kinking measures on functional radiograms could provide an effective method to evaluate malalignment of the lower cervical spine.[18]

In the current study, the CEH group had significantly more localized kinking at each adjacent vertebral body than the control group, regardless of trauma history, except for C2/C3. These results show that localized kinking measurements generally do not include the upper cervical spine. Because C2 and C3 have been demonstrated as the least flexible and mobile segments, malalignment is not obvious even on functional plain radiograms.[32] However, CEH patients without previous trauma have more segments of localized kinking than those with a trauma history. In addition, CEH patients without previous trauma significantly tend to have multiple segment rather than single segment involvement. These results may be associated with the different potential for underlying structural dysfunction. Previous studies have demonstrated trauma events are mainly associated with injury to the cervical zygapophyseal joints, intervertebral disks, or nerve roots.[33,34] But the mechanism eliciting CEH without previous trauma is more extensive.[35] Alterations in the biomechanics of the cervical, scapulothoracic and lumbar regions may be more important contributing factors in CEH patients without previous trauma than in those with a trauma history.[36] These biomechanical features are associated with a more compensatory extended cervical spine and result in multiple segment malalignment.

There was obviously less spondylolisthesis than localized kinking in the study group. For cervical malalignment in cervicogenic headache, localized kinking may be a more sensitive assessment tool than spondylolisthesis, even in patients without a history of craniocervical trauma.

Previous studies of treatment efficacy in CEH have surveyed correlations between the anatomic structure and clinical symptoms. Diagnostic anesthetic nerve blocks may provide direct anatomic evidence, but most previous reports have studied only the upper cervical spines.[3,11] Our study suggested that localized kinking in the lower cervical spine can be defined on functional radiograms, which can help in the diagnosis and prevention of further functional loss in CEH patients. Furthermore, malalignment of the lower cervical spines can also induce biomechanical dysfunction and lead to the cephalic syndrome with cervicogenic headache. Through objective image study, cephalic syndrome can be differentiated and managed more efficiently.

Future study warrants a larger sample size to define cephalic syndrome and the reliability of localized kinking. We also need to develop diagnostic nerve blockage on the segments with localized kinking to provide indirect confirmatory evidence of the pain source. A positive blockade effect occurs when the pain is drastically reduced in areas not anesthetized, for example, frontotemporal headache and associated symptoms such as photophobia are also abolished. Once the positive blockade effect occurs, the painful joint can be identified and comparison with segmental malalignment on a radiogram can be done to define the diagnostic validity of localized kinking in CEH.

### Conclusions

The study suggests that localized kinking on functional radiograms of the cervical spine can help in the diagnosis of cervicogenic headache, especially for patients with multiple segment involvement. Malalignment in the lower cervical spine may also lead to biomechanical imbalance and contribute to abnormal afferent nociception in cervicogenic headache. Hence, it is recommended that nasal symptoms can be included in the diagnostic criteria and that the clinical features be described as "cervicogenic cephalic syndrome".

## REFERENCES


1. Randanov BP, Di Stefano G, Augustuny KF. Symptomatic approach to posttraumatic headache and its possible implications for treatment. Eur Spine J 2001;10:403-7.
2. Lew HL, Lin PH, Fuh JL, Wang SJ, Clark DJ, Walker WC. Characteristics and treatment of headache after traumatic brain injury: A focus review. Am J Phys Med Rehabil 2006;85:619-27.
3. Biondi DM. Cervicogenic headache: a review of diagnostic and treatment strategies. J Am Osteopath Assoc 2005;105:16S-22S.
4. van Suijlekom HA, Lame I, Stomp-van den Berg SG, Kessels AG, Weber WE. Quality of life of patients with cervicogenic headache: a comparison with control subjects and patients with migraine or tension-type headache. Headache 2003;43:1034-41.
5. Baandrup L, Jensen R. Chronic post-traumatic headache-a clinical analysis in relation to the International Headache Classification 2nd Edition. Cephalalgia 2005;25:132-6.
6. Inan N, Ates Y. Cervicogenic headache: pathophysiology, diagnostic criteria and treatment. Agri 2005;17:23-30.
7. Sjaastad O, Fredriksen TA. Cervicogenic headache: lack of influence of pregnancy. Cephalalgia 2002;22:667-71.
8. Ogince M, Hall T, Robinson K, Blackmore AM. The diagnostic validity of the cervical flexion-rotation test in C1/2-related cervicogenic headache. Man Ther 2007;12:256-62.
9. Skillern PG. Great occipital-trigeminus syndrome as revealed by induction of block. AMA Arch Neurol Psychiatry 1954;72:335-40.
10. Hall T, Robinson K. The flexion-rotation test and active cervical mobility- a comparative measurement study in cervicogenic headache. Man Ther 2004;9:197-202.
11. van Suijlekom JA, Weber WE, van Kleef M. Cervicogenic headache: techniques of diagnostic nerve blocks. Clin Exp Rheumatol 2000;18:39-44.
12. Jensen O, Nielsen F, Vosmer L. An open study comparing manual therapy with the use of cold packs in the treatment of post concussional headache. Cephalalgia 1990;10:241-9.
13. Pfaffenrath V, Dandekar R, Pöllmann W. Cervicogenic headache-the clinical picture, radiological findings and hypotheses on its pathophysiology. Headache 1987;27:495-9.
14. Jónsson H Jr, Cesarini K, Sahlstedt B, Rauschning W. Findings and outcome in whiplash-type neck distortions.

Spine 1994;19:2733-43.
15. Fischer AJEM, Verhagen WIM, Huygen PLM. Clinical whiplash injury. A clinical review with emphasis on neuro-otologic aspects. Clin Otolaryngol Allied Sci 1997;22:192-201.
16. Ralston ME, Chung K, Barnes PD, Emans JB, Schutzman SA. Role of flexion-extension radiographs in blunt pediatric cervical spine injury. Acad Emerg Med 2001;8:237-45.
17. Ronnen HR, de Korte PJ, Brink PR, van der Bijl HJ, Tonino AJ, Franke CL. Acute whiplash injury: is there a role for MR Imaging? A prospective study of 100 patients. Neuroradiology 1996;201:93-6.
18. Griffiths HJ, Olson PN, Everson LI, Winemiller MBA. Hyper-extension strain or "whiplash" injuries to the cervical spine. Skeletal Radiol 1995;24:263-6.
19. Fredriksen TA, Hovdal H, Sjaastad O. "Cervicogenic headache": clinical manifestation. Cephalalgia 1987;7:147-60.
20. Vanagaite Vingen J, Stovner LJ. Photophobia and phonophobia in tension-type and cervicogenic headache. Cephalalgia 1998;18:313-8.
21. Schuldt K, Ekholm J, Harms-Ringdahl K, Nemeth G, Arborelius UP. Effects of arm support or suspension on neck and shoulder muscle activity during sedentary work. Scand J Rehabil Med 1987;19:77-84.
22. Swift TR, Nichols FT. The droopy shoulder syndrome. Neurology 1984;34:212-5.
23. McDonnell MK, Sahrmann SA, Van Dillen L. A specific exercise program and modification of postural alignment for treatment of cervicogenic headache: a case report. J Orthop Sports Phys Ther 2005;35:3-15.
24. Johnson G, Bogduk N, Nowitzke A, House D. Anatomy and actions of the trapezius muscle. Clin Biomech 1994;9:44-50.
25. Beazell JR. Dysfunction of the longus colli and its relationship to cervical pain and dysfunction: a clinical case presentation. J Man Manipulative Ther 1998;6:12-6.
26. Goadsby PJ, Lipton RB. A review of paroxysmal hemicranias, SUNCT syndrome and other short-lasting headaches with autonomic feature, including new cases. Brain 1997;120:193-209.
27. Davis SS, Eccles R. Nasal congestion: mechanisms, measurement and medications. Core information for the clinician. Clin Otolaryngol 2004;29:659-66.
28. Larrier D, Lee A. Anatomy of headache and facial pain. Otolaryngol Clin North Am 2003;36:1041-53.
29. Tamura T. Cranial symptoms after cervical injury. Etiology and treatment of the Barre-Lieou syndrome. J Bone Joint Surg Br 1989;71:283-7.
30. de Weerd AW, Rijsman RM, Brinkley A. Activity patterns of leg muscles in periodic limb movement disorder. J Neurol Neurosurg Psychiatry 2004;75:317-9.
31. Stovner LJ. The nosologic status of the whiplash syndrome: A critical review based on a methodological approach. Spine 1996;21:2735-46.
32. Cyriax J. Dural pain. Lancet 1978;29:919-21.
33. Barnsley L, Lord SM, Wallis BJ. The prevalence of chronic cervical zygapophyseal joint pain after whiplash. Spine 1995;20:20-6.
34. Taylor JR, Twomey LT. Acute injuries to cervical joints. An autopsy study of neck sprain. Spine 1993;9:1115-22.
35. Szeto GP, Straker L, Raine S. A field comparison of neck and shoulder postures in symptomatic and asymptomatic office workers. Appl Ergon 2002;33:75-84.
36. Harms-Ringdahl K, Ekholm J. Intensity and character of pain and muscular activity levels elicited by maintained extreme flexion position of the lower-cervical-upper thoracic spine. Scand J Rehabil Med 1986;18:117-26.

# 頸因性頭痛患者的臨床評估：初步研究

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**背 景：** 頸因性頭痛的傳統診斷準則主要根據病患的主觀症狀，因此造成鑑別診斷上的困難。本研究的目的在於根據頸因性頭痛的主觀診斷準則，評估客觀的影像診斷工具對於頸因性頭痛臨床診斷的價值。

**方 法：** 本研究由長庚紀念醫院的復健科門診，收集共 22 位臨床症狀表現符合頸因性頭痛診斷準則的實驗組病患，以及 14 位健康的受試者作爲控制組。其中有 7 位頸因性頭痛患者具有頭頸部創傷的病史。所有的病患以及健康受試者皆接受頸部側面放射學影像檢查，包含屈曲姿、中立姿與伸展姿。頸椎的局部彎折程度以及滑脫定義爲頸部的排列異常。另外，病患的主觀症狀也依據表現部位詳加記錄於問卷。

**結 果：** 實驗組與對照組之間，實驗組的下部頸椎的局部彎折程度明顯高於對照組，於統計上具有明顯的差異 ($p < 0.05$)。問卷的統計結果顯示，表現於鼻部的臨床症狀也爲常見的頭部症狀表現之一 (36.4%)。

**結 論：** 頸椎功能性放射學檢查對於頸因性頭痛的臨床診斷能夠有所幫助。因頸椎排列異常而造成的異常感覺輸入，可能爲頸因性頭痛中鼻部症狀的導因。
(長庚醫誌 2010;33:58-66)

**關鍵詞：** 頸因性頭痛，局部彎折，功能性放射學影像

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