

Case Report

Multidisciplinary Manual Therapy Management of Cervicogenic Headache: A Case Report

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ABSTRACT

The following case describes a 32 year-old female with a 1½ year history of chronic cervicogenic headache (CGH) with vertigo and chronic neck pain. After years of unsuccessful management with medication and conventional physical therapies; a therapeutic trial of multidisciplinary osteopathy spinal manipulations (MOSM) was carried out. MOSM included manipulations, soft tissue therapies, deep neck flexor (DNF) activation via pressure biofeedback, stretching exercises, postural reeducation and ergonomic corrections. After a treatment period of seven weeks the patient reported satisfactory improvement in headache, vertigo and neck pain. At the most recent follow-up, the pain had not returned to pre-treatment intractable levels along with marked improvement in cervical ROM. This case study demonstrates the importance of diagnosing and treating multiple sources of pain and the positive role of MOSM management can have in the management of patients with such clinical condition.

Key words: cervicogenic headache; neck pain; spinal manipulation; osteopathy; physiotherapy.

INTRODUCTION

Cervicogenic Headache (CGH) may be one of the three large, recurrent headaches which may be originating from upper cervical spine dysfunction. [1,2] According to International Headache Society (IHS) CGH may be defined as headache caused by a disorder of the cervical spine and its component bony, disc and/or soft tissue elements, usually but not invariably accompanied by neck pain. [3]

Typically, these patients presented pain that began with a deep sensation of pressure in the suboccipital region unilaterally, which could extend to the occipital, parietal and fronto-orbital regions and down to the shoulder and arm; sometimes, it could even radiate to the

mandibular and maxillary regions. [4] Bogduk's (2001) experiment on normal volunteers indicated that sources of CGH lie in the structures innervated by the C1 to C3 spinal nerves, and include the upper cervical synovial joints, upper cervical muscles, C2-3 disc, vertebral and internal carotid arteries and dura mater of the upper spinal cord and posterior cranial fossa. [5]

Prevalence estimates range from 0.4% to 2.5% of the general population to 15% to 20% of patients with chronic headaches. CGH affects patients with a mean age of 42.9 years, has a 4:1 female disposition, and tend to be chronic. [6]

The conservative treatment protocol for CGH comprises of spinal manual therapy and medications. A high quality systematic

review by Posadzki P & Ernst E (2011) evaluated the effects of spinal manipulative therapy on CGH. The results suggested that spinal manipulative therapy was more beneficial in treating the headaches compared to physical therapy, light massage, drug therapy, or no intervention. [7,8]

According to WHO spinal manipulative therapy includes all the procedures where the hands or mechanical devices are used to mobilize, adjust, manipulate, apply traction, massage, stimulate or otherwise influence the spine and paraspinal tissues with the aim of influencing the patient's health. [9]

The following case describes a patient with a long standing history of headache, headache induced vertigo and neck pain managed conservatively by a unique multidisciplinary osteopathic spinal manual therapy with physiotherapy measures i.e. Mulligan's Techniques, neurodynamics, postural re-education, ergonomics etc.

CASE REPORT

A 32 year old female (fulfilling the ICDH 3-beta criteria for CGH) who was short and mesomorphic, right hand dominant and lecturer by profession presented with the primary complaint of severe pain over right side of cranium with vertigo from last 3 years (refer Figure-1). She also complained of neck and upper back referring to both arms & hands since 3 years. She took time to lie down on bed as her pain didn't allow her to lay down straight. The pain was dull and diffused in nature. The pain aggravated by prolonged sitting, prolonged standing, neck movements, carrying and lifting objects in hands. Neither the rest nor lying down helped her in relieving pain. Only the medications relieved the pain for some hours. Three years back she had taken high velocity thrusts (HVT) sessions from a local bone setter which enhanced her disabilities.

She had also taken physiotherapy sessions which included soft tissue manipulations, Maitland mobilization, Mulligan mobilizations and neurodynamics but did not get any benefit regarding her condition. She was non smoker, non alcoholic. She neither had hypertension nor any other systemic disease and while sleeping used variable patterns on cushioned bed with no pillow.

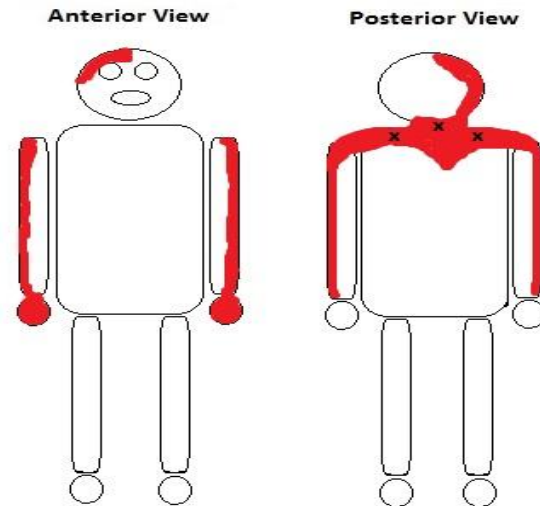


Figure-1 Showing distribution of symptoms (Body Chart)

Physical Examination

On observation she stood straight with upright posture but with forward protracted shoulders; head pointed forward. She walked with a reduced arm swing, reduced trunk and pelvic movements. On palpation tenderness over suboccipitals, left upper trapezius, spinous process (SP) & transverse processes (TP) of C5-C6 and T4 SP. On deep palpation of upper cervical paraspinal soft tissue referred pain over the right side of the head & cranium was observed. Active movements and passive movements of cervical spine were not accessible because of pain or fear of pain on day one and the end feel was empty. On functional testing pain increased with forward reaching. On neurological examination reflexes, sensation of pain, touch, temperature, pressure and vibrations

senses were normal & the patient had numbness in both upper limbs and decreased grip strength bilaterally.

Outcome Measures [10-12]

The Numerical Pain Rating (NPR) Scale, Neck Disability Index (NDI) & Henry Ford Hospital headache disability inventory (HDI) were used as outcome measures. On presentation to manual therapy department her pain was constant, dull aching, diffused & 10/10; HDI 94 & NDI 84. The pathetic pain she had ever felt.

X-Ray Investigation

- Degenerative changes in cervical spine.
- Facet arthropathy of C1-C2, C4-C5, C6-C7

Special Tests [13-19]

Cervical Compression/distraction in neutral cervical spine was positive. Altered neurodynamics of median nerve was suggested by upper limb tension test (ULTT-1). Leg length testing indicated bilateral antero-superior occipital condyles, C1left lateral, C2 process right, C3 process left, C5 process left inferior, C7 process left inferior, T4 was process left inferior. Flexion Rotation in 45⁰ of neck flexion indicated rotation fixation of C1-C2 towards left side. Muscle length testing indicated tight upper trapezius, scalene, levator scapularis, pectorals. Passive intervertebra movement testing showed GradeII Posteroanterior (PA) glides were painful on right TP of C1. GradeII PA painful on SP and TP of C2, C4, C5, C6, C7, T4. GradeIII PA painful on SP and TP of T3.

Management & Prognosis

The patient was explained about her problems and a multidisciplinary osteopathic spinal manipulative (MOSM) approach for cervical spine was offered to her (refers Table-1). She was asked to come at least twice a week for six weeks. As the primary complaint of the patient were headache & headache induced vertigo so the treatment was focused on C-1 & C-2 malalignments as

in osteopathy upper cervical corrections play an important role in pain modulation by decompressing the brainstem.

The patient was given osteopathic soft tissue release of cervical spine in side lying with a pillow under her head followed by low amplitude oscillatory mobilization for cervical spine. After few minutes she was asked to lie down straight with caution. Then osteopathic enhancement of lymphatic drainage of cervical spine, forearm traction, three finger skull traction, brainstem release and C0-C1 non thrust osteopathic release were performed. [14,20,23] When she became comfortable in straight laying a C2 rotational adjustment was performed. With an audible click marked reduction in her pain and incapacity to lie down occurred. Then home exercise programs comprised of deep neck flexor (DNF) activation, neck isometrics in supine lying and Mulligan's head oscillatory exercise in rotational restriction was explained to her after completing her first session. [21,22]

On next session she had a reduced headache and vertigo but lesser reduction in neck pain. There was an increased tenderness at the upper paraspinal soft tissue so NAGS [223] and ultrasound therapy were added to avoid post mobilization tenderness. On third session much reduction headache, neck pain & paraspinal tenderness noted. C1 lateral adjustment in supine lying was added. On fourth session the patient had no headache; neck pain & radication were reduced too but not completely. For decreasing the neck pain Maitland Mobilization of cervical spine, osteopathic manipulation of thoracic spines, DNF activation via pressure biofeedback at 20mmHg, bilateral stretching of pectoral, scalene, suboccipital, upper trapezius & levator scapularis muscles, diaphragmatic breathing, mobilization of median nerve, postural re-education and ergonomic correction were added focusing on myofascial correction of cervical and

thoracic dysfunctions. [19,20,22-25] But the patient complaint reoccurrence of headache of low intensity with no dizziness in the middle of treatment sessions. After the treatment of seven weeks i.e. 10 sessions (2 missed) the patient had almost no neck pain with a mobile neck (refer Table-2 & Figure-2,3).The intensity and frequency of headache were markedly reduced and the patient had not taken any single dose of

medication (dolamide) during and after the session. The patient was less anxious and much improved in her condition. The remaining pain was over upper thoracic spine. DNF activation, neck isometrics, stretching exercises, self neural glides and ergonomic care were incorporated as a home exercise program (HEP) to maintain long term effects.

Table-1 is showing interventions/week.

Week	Intervention
1	<ul style="list-style-type: none"> • Soft tissue release of cervical spine in side lying • Oscillatory mobilization of cervical spine in side lying • Cervical traction in supine • Contralateral traction supine • Cradling & traction supine • Mulligan's forearm traction • Suboccipital release • Brainstem release • HVLA thrust C1-C2 (short lever) • HVLA thrust C0-C1 (short lever) • Mulligan's NAGS • Ultrasound therapy – 5 minutes , 3MHz, 1.3 wt/c.m.² • C1 lateral HVLA thrust (short arm) • Supine over thigh for upper thoracic spines • Prescription of Soft collar • HEP <ul style="list-style-type: none"> ○ Diaphragmatic Breathing ○ DNF activation ○ Mulligan's Head oscillatory maneuver in supine lying ○ Cervical Isometrics in supine lying • Ergonomic advises: <ul style="list-style-type: none"> ○ Avoid prolonged posture ○ Avoid movements requiring forward bending and rotation of cervical spine ○ Maintain good posture while working or during rest.
2	<ul style="list-style-type: none"> • Continue Same Treatment Plan (C.S.T.P.) of 1st week SMT • First Rib non-thrust adjustment • Temporomandibular Joint adjustment with fist • Mastoid Adjustments via Ear • C5 PLI adjustment in sitting • Maitland GII ↓ ↓ ↓ for cervical & upper thoracic spine • Release of first rib in supine lying • ULTT1
3	<ul style="list-style-type: none"> • Maitland GIII ↓ ↓ ↓ for cervical & upper thoracic spine • Upper Thoracic Adjustments • ULTT1 • Stretching of tight muscles • Pressure Biofeedback for deep neck flexors activation • Continue HEP with no Mulligan's Head oscillatory maneuver in supine lying
4	<ul style="list-style-type: none"> • CSTP of 3rd Week MOSM • Central HVLA thrust for mid & lower thoracic spine • Adding self neural mobilization for median nerve to Continue HEP of 3rd week
5	<ul style="list-style-type: none"> • Missed treatment sessions
6	<ul style="list-style-type: none"> • CSTP of 1st week MOSM • Pressure Biofeedback for deep neck flexors activation • Continue HEP of 4th week
7	<ul style="list-style-type: none"> • Maitland GIV ↓ ↓ ↓ for cervical & upper thoracic spine • Continue HEP 4th week

Table-2 is showing treatment outcomes or changes in NRS, HDI score, frequency of headaches and ROM.

	NRS	HDI	Headache/Month	NDI	ROM (flexion/extension/sidebending right& left/rotation right & left)
Day 1	10	94	>12	84	0/0/0/0/0/0 (empty)
7 Weeks	1	22	<4	28	45/45/40/45/80/80

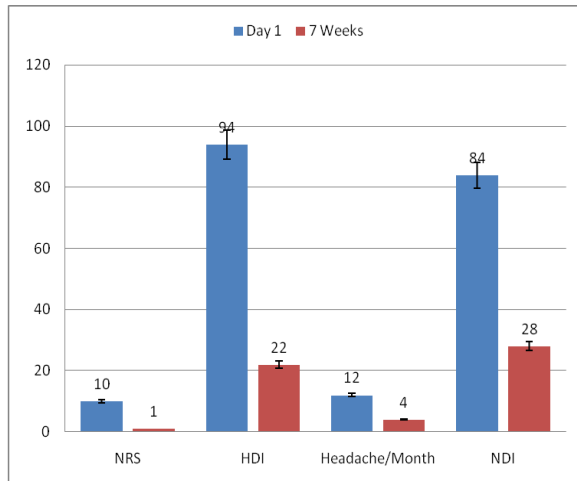


Figure-2 Showing treatment outcome or changes NRS, HDI and frequency of headaches.

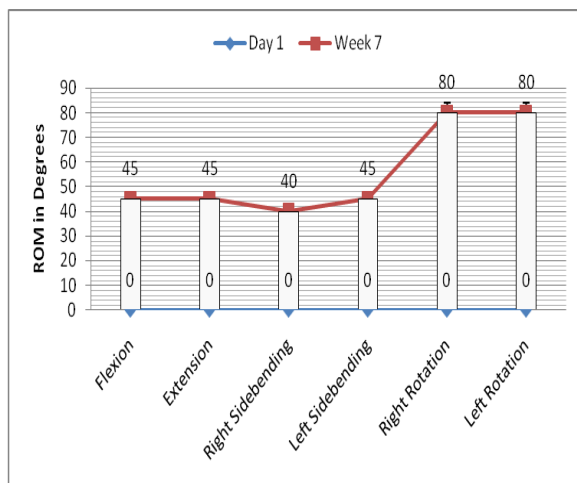


Figure-3 Showing treatment outcome or changes in cervical ROM.

DISCUSSION

The case report described assessment, differential diagnosis, management and outcome of a patient with severe headache, vertigo and radicular neck pain. The patient was a 32 years old women came with primary complaints of headache, vertigo and radicular neck pain. The patient presented with increased muscle spasm, tenderness, multiple level hypomobility/dysfunctions in cervical and thoracic spine, postural changes and hand muscle weakness.

We used NRS, HDI and NDI as self reported standardized and validated outcome measures. Management comprised of combined osteopathy & physiotherapy (MOSM) approach consisted of osteopathic soft tissue techniques, osteopathic short lever thrusts, postural re-education, exercises & ergonomics to address the identified problems summarized above. At discharge the patient demonstrated clinically meaningful improvements in pain, disability, intensity and frequency of headache. This case report indicates that a MOSM management program using osteopathic spinal manipulations; thrust & non-thrust, exercises and patient education may be clinically very effective in conservative management of patients diagnosed with CGH. These results are in favor of findings described by previous researches concluded that spinal manipulation/mobilisation was effective in people suffering from migraine; cervicogenic headache; cervicogenic dizziness; neck pain tension-type headache and other neuro-musculoskeletal conditions (van Duijn J, van Duijn AJ & Nitsch W, 2007; Bronfort G, Haas M, Evan R, Leininger B & Triano J, 2010). [22,26] This case report also agreed the findings suggested by Gross AR, Hoving JL & Haines TA (2004) that mobilization and/or manipulation when used with exercise are beneficial for persistent mechanical neck disorders with or without headache. [24]

Miller J et al (2010) calculated pooled relative risk (pRR) and standardized mean differences (pSMD) of 17 randomized controlled trials. They suggested low quality evidences of clinically important long-term improvements in pain (pSMD-0.87(95% CI: 1.69,0.06)), function/disability and global perceived effect when manual therapy and exercise are compared to no treatment, and

high quality evidence of greater short-term pain relief [pSMD-0.50 (95% CI:0.76,0.24)] than exercise alone, but no long-term differences across multiple outcomes for (sub)acute/chronic neck pain with or without CGH. They also suggested moderate quality evidence supporting this treatment combination for pain reduction and improved quality of life over manual therapy alone for chronic neck pain. [27] Maitland G, Hengeveld E, Banks K & English K (2001) reported cervical spine mobilization were as effective as manipulation in reducing neck pain and related disability among chiropractic patients. Given the comparable outcomes and the risk of serious complications resulting from cervical spine manipulation, one may obtain equally effective results with less risk of adverse effects by treating neck-pain patients with mobilization rather than manipulation. In addition, they showed that neither heat nor EMS, alone or in combination with manipulation or mobilization, appreciably improve clinical outcomes, although heat may be of short-term benefit for some patients. Dvorak J, Schneider W, Dvorak V & Gilliar W (2008) had also reported the same results. However both these suggested manipulation may be more effective than mobilization for specific clinical indications than other conservative treatments and also they have a low annual incidence of major harms or complications. [25,28]

This patient appeared to benefit from multidisciplinary interventions specific to spinal alignment, centralization, exercise and re-educational categories, which included osteopathic soft tissue techniques, short lever manipulations, segmental mobilization, intermittent manual cervical traction and muscle re-conditioning. Throughout Phase I of her treatment, the patient remained primarily within the centralization category, with greater emphasis placed on the headache & vertigo as she progressed with decreased pain,

increased ROM, increased functional mobility, improved posture, and less substantial centralization effects. Though this case report may be in contrast of TBC algorithm for deciding management of neck impairments provided by Fritz JM, Brennan GP (2007) but the results seem to support the notion suggested by Heintz MM & Hegedus EJ (2008) that outcomes are better when patients are treated by receiving interventions matched to their appropriate category. [29,30] This case report suggests incorporation of osteopathy techniques in physiotherapy results in more substantial and ground results for CGH. So more randomized control trial and case reports incorporating MOSM model in physiotherapy are suggested for future researches.

CONCLUSION

Accepting the limitations of a single-case design, the presented hypothesis may offer new insight into the contribution of combination of osteopathy & physiotherapy for CGH, headache induced vertigo & radicular neck pain. This may be worth consideration in an attempt to lessen the debilitating impact to patients when determining the multidisciplinary intervention strategy. More research in the area of combination of physiotherapy & osteopathic interventions should be conducted for CGH, degenerative cervical spine and other musculoskeletal conditions.

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REFERENCES

1. Sjaastad O, Bakketeig LS. Prevalence of cervicogenic headache: vaga study of headache epidemiology. *Acta neurol scand* 2008;117(3):173-80.
2. Bartschi-Rochaix W. Headaches of cervical origin. In: Vinken PJ, Bruyn W (eds) *Handbook of clinical neurology: Headache and cranial neuralgia*. North Holland, Amsterdam 1968; 5:192–203.
3. International Headache Society. The international classification of headache disorders, 3rd edition (beta version). *Cephalalgia* 2013;33(9): 629–808.
4. Antonaci F, Bono G, Mauri M, Drottning M, Buscone S. Concepts leading to the definition of the term cervicogenic headache: a historical overview. *J Headache Pain* 2005; 6:462–466.
5. Bogduk N. Cervicogenic headache: anatomic basis and pathophysiologic mechanisms. *Curr pain headache rep* 2001; 5(4):382-6.
6. Haldeman S. Cervicogenic headaches-a critical review. *The spine journal* 2001; 1(1): 31-46.
7. Posadzki P, Ernst E. Spinal manipulations for cervicogenic headaches: A systematic review of randomized clinical trials. *Headache: J Head Face Pain* 2011, 51:1132–1139.
8. Clar C, Tsertsvadze A, Court R, Hundt GL, Clarke C, Sutcliffe P. Clinical effectiveness of manual therapy for the management of musculoskeletal and nonmusculoskeletal conditions: systematic review and update of UK evidence report. *Chiropractic & manual therapies* 2014; 22:12.
9. Sweaney Dr. JA. WHO guidelines on basic training and safety in chiropractic. *World health organization* 2005; 1-44.
10. Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Validity of four pain intensity rating scales. *Pain* 2011;152: 2399–2404.
11. Jacobson GP, Ramadan NM, Aggarwal SK, Newman CW. The Henery Ford Hospital headache disability inventory (HDI). *Neurology* 1994; 44:837-842.
12. Vernon H, Mior S. The Neck Disability Index: A study of reliability and validity. *Journal of manipulative and physiological therapeutics* 1991;14: 409-415
13. Buckup K. *Clinical tests for musculoskeletal system: Examinations-Signs-Phenomena*. Thieme 2004.
14. Maitland J. *Spinal manipulation made simple- a soft tissue techniques*. North atlantic books 2001.
15. Cooperstein R. Heuristic exploration of how leg checking procedures may lead to inappropriate sacroiliac clinical interventions. *Journal of chiropractic medicine* 2010; 9: 146–153.
16. Mannello DM. Leg length inequality. *J manipulative physiol ther* 1992;15(9): 576-90.
17. Knutson GA. Anatomic and functional leg-length inequality: A review and recommendation for clinical decision-making. Part I, anatomic leg-length inequality: prevalence, magnitude, effects and clinical significance. *Chiropractic & osteopathy* 2005, 13:11.
18. Hall TM, Briffa K, Hopper D, Robinson K. Comparative analysis and diagnostic accuracy of the cervical flexion–rotation test. *J headache pain* 2010; 11(5): 391–397.
19. Walsh MT. Upper limb neural tension testing and mobilization fact, fiction, and a practical approach. *Journal of hand therapy* 2005; 18:241–258.
20. Nicolas AS, Nicolas EA. *Atlas of osteopathic techniques*, 2nd edition.
21. Mulligan BR. *Manual Therapy: “NAGS”, “SNAGS”, “MWM” etc*. Fifth edition.
22. van Duijn J, van Duijn AJ, Nitsch W. Orthopaedic manual physical therapy including thrust manipulation and exercise in the management of a patient with cervicogenic headache: a case report. *The journal of manual & manipulative therapy* 2007; 15(1): 10–24.

23. Page P. Cervicogenic headaches: an evidence based approach to clinical management: Clinical suggestion. The international journal of sports physical therapy. 2010; 6(3): 254-266
24. Gross AR, Hoving JL, Haines TA, Goldsmith CH, Kay T, Aker P, Bronfort G. A cochrane review of manipulation and mobilization for mechanical neck disorders. Spine 2004; 29:1541– 1548.
25. Maitland GD, Hengeveld E, Banks K, English K. Maitland's Vertebral Manipulation, 6th ed. Boston, MA: Butterworth, Heinemann, Oxford; 2001
26. Bronfort G, Haas M, Evans R, Leininger B, Triano J. Effectiveness of manual therapies: the UK evidence report. Chiropr Osteopathy 2010, 18:3.
27. Miller J, Gross A, D'Sylva J, Burnie SJ, Goldsmith CH, Graham N, Haines T, Bronfort G, Hoving JL. Manual therapy and exercise for neck pain: A systematic review. Manual Therapy 2010; 15:334-354.
28. Dvorak J, Schneider W, Dvorak V, Gilliar W. Musculoskeletal manual medicine: diagnosis and treatment. Thieme medical pub 2008.
29. Fritz JM, Brennan GP. Preliminary examination of a proposed treatment-based classification system for patients receiving physical therapy interventions for neck pain. Physical therapy 2007; 87(5):513-24.
30. Heintz MM, Hegedus EJ. Multimodal management of mechanical neck pain using a treatment based classification system. The journal of manual & manipulative therapy 2008; 16(4):217-224.

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