

Relief of neurological symptoms by SOT Category I block placement, secondary to surgical removal of Thoracic Astrocytoma and Laminectomy: A case report

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Narrative: Astrocytomas originate from a particular kind of star-shaped glial cell found in the cerebrum portion of the brain, cells called astrocytes. This type of tumour usually does not spread outside the brain and spinal cord nor does it usually affect other organs. Here I report the case 28-year-old nulliparous female with a history of a 4" thoracic pilocytic astrocytoma and subsequent laminectomy.

The patient sought care post laminectomy for dull, constant lower back pain, neuropathy, paresthesias and visceral dysfunction.

The purpose of this case report is to describe the clinical course, treatment, and immediate and repeated positive response of a female patient suffering from symptoms of post-surgical laminectomy and resection of a thoracic pilocytic astrocytoma. This included Chiropractic treatment utilising Sacro Occipital Technique (SOT) Category I block placement. The patient outcomes were beneficial.

Indexing terms: Chiropractic; SOT, Category 1; post-laminectomy; astrocytoma.

Introduction

While more common in children relatively '*little is known about the behaviour of pilocytic astrocytomas in adult patients, largely due to the rarity of pilocytic astrocytoma in this population. Some data suggest that adults share the excellent prognosis seen in children, while other reports suggest more aggressive tumour behaviour in adult patients.*' (1)

The National Cancer Institute Surveillance, Epidemiology, and End Results Program (1973-2008) found that '*survival rates declined significantly with age.*' (1) They also found that gross '*total resection was a positive prognostic indicator in adults, while patients receiving radiation had shorter survival*

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regardless of extent of resection'. (1)

Neoplastic diseases involving the spine are classified according to the location of the tumour: epidural, intradural (Figure 1), extramedullary, or intramedullary. (2)

Astrocytomas originate from a particular kind of star-shaped glial cell found in the cerebrum portion of the brain, cells called astrocytes. This type of tumour usually does not spread outside the brain and spinal cord nor does it usually affect other organs. There are two broad classes recognised in the literature:

- i. those with narrow zones of invasive infiltration e.g., pilocytic astrocytoma, subependymal giant cell astrocytoma, pleomorphic xanthoastrocytoma, and
- ii. those with clear outlines on diagnostic images. Astrocytomas can occur at any age. (1)

Pilocytic astrocytomas occur predominately in the paediatric population and are allegedly characterised by a benign course, regardless of treatment. (1, 3) According to WHO data the lowest grade astrocytomas (grade I) make up only 2% of recorded astrocytomas. (1)

Spinal cord tumours are generally considered to occur only about 10% as frequently as intracranial neoplasms. Only 30% of such tumours are intramedullary, and in adults the majority of these are ependymomas. Thus, an intramedullary astrocytoma of the spinal cord in the adult patient is a fairly uncommon entity. Due to the rarity of the condition and its indolent clinical evolution, evaluation of treatment efficacy is quite difficult. The biology of an astrocytoma is, of course, unpredictable, and no one can accurately foretell the future outcome. (5) Pilocytic astrocytomas are commonly indolent which may permit normal neurologic function. However, left unattended these tumours may eventually undergo neoplastic transformation.

Complete resection of high-grade astrocytomas is impossible because of the diffuse infiltration of tumour cells into normal parenchyma. High grade astrocytomas often recur after the initial surgery or therapy, and usually require repeat treatment similar to what was previously done. Despite decades of therapeutic research, curative intervention is still nonexistent for high-grade astrocytomas; patient care ultimately focuses on palliative management. Even benign astrocytomas have the capacity to infiltrate adjacent neural tissue and it's very difficult to have total removal without leaving some microscopic tissue disruption of nearby cells is. With that said, radical excision is associated with minimal morbidity and long-term prognosis is usually excellent if the surgery was performed before evidence of any significant disability. (4)

Intramedullary spinal cord astrocytomas are rare, representing only 6–8% of all spinal cord tumours. The small case numbers in published reviews have limited the

Figure 1: Intradural astrocytoma



conclusions that can be drawn regarding the efficacy of various treatments. Patients with pilocytic tumours had significantly greater ten year and median survival rates than those with infiltrative tumours (78% vs. 17% and 39.9 vs. 1.85 years, respectively; $p < 0.001$). Patients with pilocytic tumours survived significantly longer if they were less than twenty years old at the time of diagnosis ($p = 0.03$) or had thoracic cord involvement ($p=0.049$). (5) '*...data pertaining solely to adults is often difficult to extract.... Currently (as of 1988), there are only a few reports of patients with astrocytomas treated ...*' (3)

Brain and other central nervous system tumours have a very high likelihood of producing long-term disabilities owing to the tumour itself and the effects of treatment, including surgical complications, neurotoxic effects of radiation, and debility caused by chemotherapy. (6)

The purpose of this case report is to describe the clinical course, treatment, and immediate and repeated positive response of a female patient suffering from symptoms of post-surgical laminectomy and resection of a thoracic pilocytic astrocytoma. This included Chiropractic treatment utilising Sacro Occipital Technique (SOT) Category I block placement. Additionally, this case report provides a theoretical understanding of why Category I block placement was effective in this case.

Case history

The patient is a 5'5" 165 cm, 115 pound 52 kg, 28-year-old nulliparous female with a history of a 4" 10 cm thoracic pilocytic astrocytoma and subsequent laminectomy (12/7/14) of T4-T7 who presented to this office on 9/21/15. 10% of the tumour was left in situ for fear of creating lower limb paralysis. She suffers with complaints of dull, constant lower back pain, neuropathy, paresthesias and visceral dysfunction.

She also reported pain and numbness in both legs, pins and needles in left leg, foot pain, lack of feeling in her feet, and cramps in both feet. The buzzing in her legs is reproduced or increased by palpation along the incision.

Post-surgery she was unable to walk for two weeks and stated that she felt a continuous 'buzzing' in her legs. She had difficulty with getting in and out of a car, sitting at a table, pushing, sexual activity, and it is painful to stand more than an hour. The patient stated that she was on the following medications for her neuropathic presentation: Lyrica 75 mg 4x/day, Dilaudid 4 mg 4x/day, morphine, night-time lidocaine patches, and Cymbalta.

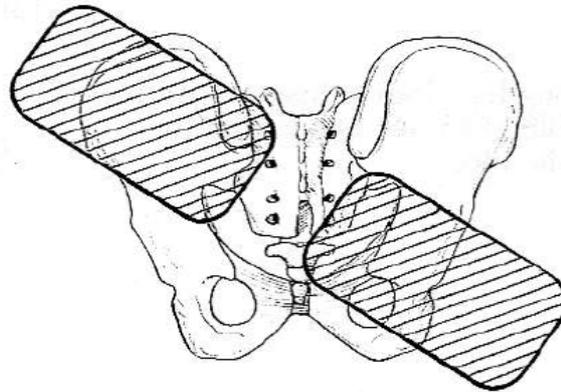
Treatment

Prior to presentation to this clinic, the patient had been receiving a rigorous schedule of physical therapy consisting of office and aqua therapy during the previous nine months. She continued her therapy program concomitant with treatment in this office. Between September 21st and December 21st, 2015, she received 25 treatments at my (WJB) office. From January 11th through April 6th, 2016 she had received 9 treatments. Treatments during this time reduced many of her symptoms, these included the following: adjustments to the cranium, full spine, extremities, pelvic balancing, soft tissue release techniques and visceral adjustments. On

November 10th, 2015, indications for Category I block (Figure 2) placement were identified and repeated on January 23rd and December 3rd of 2015.

Figure 2: Functional Right Short Leg – Category One Block Placement

ASIS Block



Acetabular block

Results

It was noted that when Category I blocking was performed there was a quick (within five minutes) cessation of the 'buzzing' in her legs, and this result would last anywhere from several hours to twelve hours. Due to the infrequency of treatment, her plans to go to Mexico for a two-week vacation, and the obvious reduction of symptoms with block placement, the patient was instructed on home use of DeJarnette blocks mimicking what was done in the office that produced a cessation of her symptoms. She took them with her to Mexico and used them daily. She reported that the vacation was 'great', she was able to do more activities of daily living and suffered no bad bouts while in Mexico.

Discussion

Pins and needles is a tingling that has been described using colourful analogies, such as '*a faint comfortable soda water sensation*', '*a buzzing*', '*a fine light tingle*', '*ants running up and down inside the skin*', (7) or as my patient had stated, '*like bees buzzing around my legs*'. The onset is definite and sharp, and can be described with accuracy in a few seconds.

In an article by Weddell, compression tingling was created by compressing an adequate length of nerve to produce either

- a. mechanical deformation
- b. lack of oxygen
- c. accumulation of local metabolites

- d. a lowering of the threshold to stimulation of the nerve due to one or more of the above causes, or
- e. a combination of these causes. (7)

The production of the stimulus is related to mechanical deformation, inhibition of normal circulation, anoxia, or other factors which lower the threshold to stimulation, and is interpreted by touch nerve fibres rather than pain fibres.

According to Breig, 'neurological symptoms being evoked by movements of the spinal column is well established and many are the studies concerned with the nature of the mechanical forces generated by these movements in the presence of pathological structures and lesions'. (8) Lhermitte and others have proposed that neurological electrical sensations are due to 'lashing' of demyelinated lengths of the cord against the inside of the canal as the cervical spine is flexed. (8)

That neurological symptoms occur when the spinal column is flexed was a clear indication that they were produced by elongation of the spinal cord and pons-cord tract, which increased the tension in the pia and nervous tissue. The normal elastic elongation of the cord can be affected by both superficial and internal scarring of nervous tissue, restricting its stretching and bending capacity. If spasticity and impaired sensibility of the whole lower half of the body is involved, Breig felt this was often indicative of intramedullary tension. (8)

Breig continues 'Clinical experience shows that so long as the elasticity of the relevant pathways is not exceeded and the blood supply is not compromised, relief of the tension can result in abolition of the neurological sign and symptoms, and lead to a fairly complete recovery of their conductivity'. (8)

Rossitti states 'Folding and unfolding of the nervous tissue, of its axis cylinders, neurological network, blood vessels and pia mater was seen to occur without significant displacement of the neural axis up or down with the posterior cranial fossa and spinal canal. Under normal conditions, only extremely small forces (of the order of fractions of one gram) are involved in the deformation of the nervous tissue'. (9)

According to Rossitti, traction of the spinal cord may be transmitted to the brain stem and cranial nerves. (9) He states that how the myelin sheath, both of the nerve roots and of the central axis cylinders, behaves during flexion and extension of the spinal cord is not precisely known. (9)

Ventroflexion of the spine elongates the spinal canal and extension of the spine shortens the spinal canal. Flexion sets up an elastic tension that pulls taut and elongates the pons-cord tract and associated nerve roots, whereas extension slackens the pons-cord tract and increases its cross sectional area. (9) Reid observed in autopsy studies that axial displacement of the spinal cord and its dura can occur during flexion and extension of the head, neck and trunk, being most evident at the nerve root levels of C8-T5. Stretching of the dura and cord was observed during flexion. Traction of the spinal cord may be transmitted to the brain stem and cranial nerves. (9)

'The effect of this physiological load on the junction of central and peripheral myelin of the cranial nerves has not been studied. This phenomenon may play a significant role in the so-called microvascular compression for the pathogenesis of certain cranial nerve rhizopathies'. (9)

'The spinal dura is a cylindrical sheath that surrounds the spinal cord and spinal nerve roots and passes through the intervertebral foramina. Along with the other dural spinal attachments, an external aspect of the spinal dura has attachments by fibrous slips to the posterior longitudinal ligament to a fatty connective tissue layer called epidural fat. This separates it from the periosteum and provides additional cushioning for the spinal cord and nerves within the spinal cord. The various dural attachments allow stability, yet still enable flexibility. The lateral wall of the dura is stabilised internally by the pia mater and therefore also to the spinal cord by the denticulate ligament. The denticulate ligament attaches to the spinal dura at regular intervals from the foramen magnum to the conus medullaris by tooth-like extensions of the pia mater between each spinal nerve'. (10)

The dura mater, pia mater and dentate ligament may be described as a functional unit. The dura mater is continuous all the way from the cranium to the end of the spinal cord. Rossitti feels that distortions of the spinal cord and brain stem created by bodily movements may have implications for changes in motor, sensory and autonomic functions. (11) According to Sacro Occipital Technique™ concepts and practice, there are many procedures which can be called upon to restore normal function to the central and peripheral nervous systems. (12)

The Chiropractic model of neurologic subluxation rests upon the understanding that there is a continuity of the meninges within the spinal cord, brain, pelvis, cranium, peripheral and central nervous systems, and the skeleton.

Schafer states that *'the subluxation may cause mechanical restrictions upon the flow of cerebrospinal fluids within the central nervous system and perhaps within the peripheral nerves themselves'. (12) 'Minute pressure on meninges may alter the mechanics or flow of cerebrospinal fluid and interfere with its ability to remove waste and provide nutritional substances to the cord and nervous system. This may be the effect of either direct mechanical pressure or impairment of motion, which is necessary for a proper inflow and outflow of this nutrient material'. (12)*

According to DeJarnette, 'Category I correct blocking technique accomplishes the following: aligns the dural ports, removes dural torque and frees the minor dural port constrictions and calms the proprioceptors'. (13) *'The Category I blocking is the only system that actually corrects dural ports and dural sleeve pressure'. (13)*

Hypothetically the buzzing symptoms in this patient's legs, along with her increased sensitivity and feelings of hyper-irritation when touched around her laminectomy scar, were due to tensions, torsions and deformations created by spinal and dural scar tissue and subsequent interference to normal neurological function. By releasing cord tension and torsion in the spinal cord, better cerebrospinal fluid circulation, increased removal of waste metabolites and improved oxygenation is created. Thus Category I blocking can create a relative flexion/extension release of the sacrum and spinal cord. It is our opinion that this contributed to the diminishment and cessation of her buzzing symptoms.

Many of the patient's symptoms improved significantly during her six months of Chiropractic care, some of these are listed here: she can defecate without need of Relastor injections, she can use an enema without having concurrent bleeding, she began to have menstrual periods again, there was marked improvement to her sense of balance and she no longer needed a roller walker to get around, she has been able to ambulate with use of a cane for assistance or can walk freely, she has more feeling in her feet and less buzzing in her legs, low back pain is diminished, she has increased rib stability, and a reduced dependence on medications.

Although much progress was reported, the constant complaint of buzzing did not seem to have any sustained response to care until Category I blocking was instituted. The relief of her paresthesia, which she describes as buzzing, is eliminated within five minutes of Category I blocking and the result would last for hours. This result has been repeatable for this patient and she has shared this treatment with others on an internet group. (14) There are no other reported cases in the literature of Chiropractic treatment for post-surgical astrocytoma patients. It is possible that the positive changes of the subject may be the result of normal progression toward the mean of the condition.

Conclusion

The results of this case study indicate the potential of Chiropractic adjustments and specifically SOT Category I blocking as a treatment for a subset of patients suffering from a myriad of symptoms after astrocytoma surgery.

Caution about generalising these results to other patients is advised. However, this patient's response to care suggests a potential boon to others who suffer from this horrible condition. That her condition has improved, the improvement is sustained, and that when symptoms recur, they respond quickly to Category I block placement is suggestive that this therapy is directly related to her improvement.

It is hoped that this study will generate greater interdisciplinary interest and cooperation so that patients suffering with this condition may have an alternative choice of treatment with reduced need for prescription medications. However, further research is needed that focuses on alternative treatments for the subset of patients who have this condition.

Evidence context

This descriptive study is an observational design and is limited as an n of 1 report, lacking controls. The effect of potential confounding factors, including comorbidities, cannot be excluded. We recognise that subluxation identification and correction is the art of the individual Chiropractor.

The findings could support the clinically relevant hypothesis that the identification and correction of dural tension is a modifiable contributor to the effective management of the clinical presentation of pain and 'tingling' post laminectomy around T4 - T7.

This report is eligible for inclusion as 'expertise' bringing clinical insights into the JBI FAME evidential ring (15) to inform evidence-based healthcare in general and the science of Chiropractic in particular.

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Cite: Boro WJ, Blum CL. Relief of neurological symptoms by SOT Category I block placement, secondary to surgical removal of Thoracic Astrocytoma and Laminectomy: A case report. *Asia-Pac Chiropr J.* 2026;6:4 apcj.net/Papers-Issue-6-4/#BoroBlumPostSurgerySOT

References

1. Johnson DR, Brown PD, Galanis E, Hammack JE. Pilocytic astrocytoma survival in adults: analysis of the Surveillance, Epidemiology, and End Results Program of the National Cancer Institute. *J Neurooncol.* 2012 May;108(1):187-93.
2. Byrne T, Benzel E, Waxman S. *Diseases of the spine and spinal cord.* New York: Oxford University Press. 2000.
3. McCormack B, Miller D, Budzilovich G, Voorhees G, Ransohoff J. Treatment and Survival of Low-Grade Astrocytoma in Adults--1977-1988. *Neurosurgery.* 1992;31(4):636-42.
4. Epstein F, Farmer J, Freed D. Adult intramedullary astrocytomas of the spinal cord. *Journal Of Neurosurgery.* 1992;77:355-9.
5. Minehan K, Brown P, Scheithauer B, Krauss W, Wright M. Prognosis and Treatment of Spinal Cord Astrocytoma. *International Journal Of Radiation Oncology Biology Physics.* 2009;73:727-733.
6. Vargo M. Brain tumor rehabilitation. *Am J Phys Med Rehabil.* 2011;90(5 Suppl 1):50-62.
7. Weddell G, Sinclair D. "Pins and needles" observations on some of the sensations aroused in a limb by the application of pressure. *Journal of Neurology, Neurosurgery & Psychiatry.* 1947;10(1):26-46.
8. Breig A. *Adverse mechanical tension in the central nervous system.* Stockholm: Almqvist & Wiksell International. 1978. 207-31.
9. Rossitti S. Biomechanics of the pons-cord tract and its enveloping structures: An overview. *Acta Neurochir.* 1993;124:144-152.
10. Piera G, Dwyer P, Blum C. Coughing to release the dura in category III patients experiencing sciatica: Report of 3 cases. *Chiropractic Journal Of Australia* 2004;34:82-5.
11. Brown J, Chung J, O'Connell K. Complications following brain surgery improved after upper cervical chiropractic care: A case study. *J Upper Cervical Chiropr Res.* 2013;Spr(2):43-48.
12. Blum C, Curl D. The relationship between sacro-occipital technique and sphenobasilar balance. Part One: The key continuities. *Chiropractic Technique.* 1998;10(3):95-100.
13. DeJarnette MB. *Sacro Occipital Technic, 1984.* Privately Published: Nebraska City, Nebraska. 1984.
14. Spinal Cord Tumor Association group (n.d.). In Facebook. [<https://www.facebook.com/groups/48390166351/>] Last accessed April 15, 2016.
15. 7.2.2. Descriptive study designs. *JBI Manual for Evidence Synthesis.* 2024 edition. At <https://jbi-global-wiki.refined.site/space/MANUAL/355598734/7.2.2.+Descriptive+study+designs>



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