CASE STUDY

Resolution of Irritable Bowel Symptomatology in a Patient Undergoing Upper Cervical Chiropractic Care

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ABSTRACT

Objective: To describe the upper cervical chiropractic care of a patient presenting with Irritable Bowel Syndrome (IBS), depression, and anxiety.

Clinical Features: A 32-year-old female who suffered from IBS daily and depression for ten years presented for care. Symptoms included painful, runny bowel movements every morning upon rising. Discomfort and bloating were noticed most of the day. Symptoms were exacerbated by alcohol consumption, stress, large meals, and fatty foods.

Intervention & Outcomes: Specific upper-cervical adjustments were delivered at the atlanto-occiptial area in the knee-chest position to correct vertebral subluxation. Criteria used to determine whether or not an adjustment was given on a visit were based on paraspinal thermography. The patient also reported depression and anxiety previously diagnosed by her primary care physician. Following care the patient stated that bowel function was restored to normal and noted a decrease in incidence of depression and anxiety.

Conclusion: Upper-cervical chiropractic care of a patient with IBS is presented. Resolution of bowel symptoms was attained with reduction of cervical subluxation. Additionally, a reduction of the frequency and intensity of symptoms related to depression and anxiety was seen.

Key Words: *Irritable Bowel Syndrome, upper cervical, vertebral subluxation, Knee Chest Technique*

Introduction

The average prevalence of IBS is estimated between 12-30% of the United States (US) population and 5-10% worldwide.[1] It is seen more in female patients,[2] and is more likely to present as diarrhea than constipation according some surveys.[3] Less than half of the US population who suffer with IBS will seek healthcare, accounting for 12-14% of primary care visits and 28% of referrals to gastroenterologists.[1] Direct and indirect costs for this care is estimated at 15-30 billion US dollars annually. [1]

Currently in the US management is mostly medical and aimed at reducing symptoms like pain, diarrhea, and constipation. Alternative therapies such as exercise, probiotics and dietary changes, have shown an improvement in IBS patients' quality of life scores.[1] However, no current therapy involves correction of neurological malfunction.

1. Private Practice of Chiropractic – Juneau, AK

According to the National Institutes of Health, certain symptoms must be present, such as: "A change in frequency of bowel movements; A change in appearance of bowel movements; Feelings of uncontrollable urgency to have a bowel movement; Difficulty or inability to pass stool; Mucus in the stool; Bloating."[4]

Bleeding, fever, weight loss, and persistent severe pain are not symptoms of IBS and may indicate other problems such as inflammation, or rarely, cancer. The following have been associated with a worsening of IBS symptoms:

- Large meals
- Bloating from gas in the colon
- Medicines
- Wheat, rye, barley, chocolate, milk products, or alcohol
- Drinks with caffeine, such as coffee, tea, or colas
- Stress, conflict, or emotional upsets

Researchers have found that women with IBS may have more symptoms during their menstrual periods, suggesting that reproductive hormones can worsen IBS problems.

In addition, people with IBS frequently suffer from depression and anxiety which can worsen symptoms. Similarly, the symptoms associated with IBS can cause a person to feel depressed and anxious.[4]

Medical interventions for IBS include laxatives, fiber supplements, antidiarrheal medications, antispasmodics, antidepressants and alosetron hydrochloride (Lotronex). Lotronex is used in women who do not respond to conventional therapies and have diarrhea as a primary symptom. Life style changes, such as stress reduction techniques and changes to diet[5] are also advocated.

The gastrointestinal tract is highly innervated; extrinsic sympathetic nerves that affect the arterioles mediating absorption rates and regulate microcirculation are located in the submucosa. This reflex is controlled by acetylcholine from internal sensory nerves located in the GI tract. Additionally, it is believed that extrinsic sensory reflexes are enacted during inflammation.[6]

The non-andrenic non-cholenergic (NANC) nerves serve as inhibitory nerves in the colon and are considered the most important in regulating the enteric system in humans. Inflammation tends to change the innervation of the colon in favor of NANC innervation, possibly leading to abnormal motility and diarrhea.[7] This NANC allows for physiological mediation of the gastrointestinal system by both the sympathetic and parasympathetic nervous systems; dysfunction in one or both could be linked to bowel irritation.[8]

Case Report

Patient History

The patient is a 32 year old female optometrist presenting with a complaint of loose, painful, runny stools upon waking with abdominal pain and bloating beginning ten years earlier. The patient admitted to a history of alcohol consumption that has in the past contributed to her symptoms. Upon cessation of drinking her symptoms remained, though to a lesser degree.

Also noted was a complaint of mild depression which began three years earlier, and anxiety that began 10 years prior. Her medical doctor diagnosed both four years ago and both were being managed medically. Also, her medical history revealed a history of gallstones beginning in 1994 leading to a cholecystectomy and appendectomy in 2004.

Past medical history revealed involvement in two motor vehicle accidents. One at the age of 10, where she was struck as a pedestrian leaving her in a coma for three days with a lacerated kidney. The second was at 21 years old as a passenger where she suffered a fractured pelvis.

Examination

Physical examination showed normal vitals and an unremarkable heart and chest exam. Visual inspection of the abdomen showed surgical scars from a cholecystectomy. Bowel sounds were normoactive at 15 per minute and friction rubs were auscultated over the liver.

Postural abnormalities were noted in her initial examination:

- Right head tilt of 2 cm with slight right rotation
- Anterior head translation of 2 cm
- High right shoulder 4 cm
- High right ilium 5 cm

A decreased range of motion in the cervical spine was noted with a decrease in right rotation and lateral flexion.

An SF-36 Health Survey was also used as an outcome assessment tool. Her initial scores were 59% PCS, 40 MCS. Individual scores were 57% General Health, 100% Bodily Pain and Physical Function, and 72% Mental Health.

Intervention

In order to test neurophysiology, digital paraspinal infrared imaging was used. Thermography has been shown to be a valid and reliable measure of autonomic function.[9-11]

Thermal analysis was conducted from C7 to occiput, and compared to normal data for the cervical spine. The patient's scan contained thermal asymmetries ranging up to 2.09º C (Figure 1-5). Asymmetries greater than 0.5º C indicate neuopathophysiology and abnormal autonomic regulation.[12-14]

Since thermography indicated an upper cervical subluxation, specific radiographs were taken to assess the misalignment in the occipital-atlanto-axial joint space: a lateral, A-P, A-P Open Mouth and Vertex views were taken (Figures 6-8). Analysis was based on comparing osseous structures associated with the neural axis (Foramen Magnum).[15]

Laterality and rotation were assessed for C1 and C2 vertebrae, as well as the anterior angle of C1. Left laterality of atlas was found, with 20.4º of anteriority and 1.1º of posterior rotation. Additionally noted on the radiographs was a sufficient loss of

disc space and reactive sclerosis with boney proliferation at the C5-C6 disc-space with secondary boney proliferation at the Uncinate processes at C5-C6. A diagnosis of secondary IVOC with associated osteophytes, and DJD of the uncovertebral at C5-C6 was given. (Figure 6).

Having established the presence of an upper cervical subluxation through thermography and radiographs, chiropractic care was discussed with the patient and a care plan was created. The patient was adjusted in the knee-chest position with her head turned to the left. The knee-chest position was chosen with its mechanical advantage and its inherent ability to allow cervical curve to remain while preventing compressive forces to the cervical spine and intervertebral discs.[16] A manual adjustment was delivered using the left posterior arch of C1 as a contact point to introduce a high-velocity, low-amplitude thrust.

Outcome

After the adjustment the patient was sent to rest in a supine position for 30 minutes. Outcome of the adjustment was determined through a post-adjustment thermographic assessment. Reduction of the thermal asymmetry was achieved, indicating a movement towards normal neurophysiology.

The following visit the patient reported that she had a pain-free, solid bowel movement the morning after her first adjustment which has continued. Furthermore, the patient reported better mood and less frequency of anxiety when faced with her normal triggers. Over the next several weeks the patient was monitored via thermographic imaging twice a week and an adjustment was only given when there was sufficient thermographic data showing an asymmetry great enough to warrant adjustment. The patient was adjusted two additional times. Each time the patient was symptomatic, the first with depressed mood and the second with IBS related symptoms. Both times the patient exhibited a similar thermal asymmetry as the first visit.

The patient was reassessed and another SF-36 was completed after 3 months of care. New scores were increased the Mental Component from 40% to 53% with Physical Component the same at 59%. General Health went from 57% to 72% and Mental Health went to 84% from 72%.

Discussion

Chiropractors, as well as osteopaths and medical practitioners, have associated visceral disease and immune dysfunction with segmental disturbances within the spine that affect the CNS. Regulation of the GI tract is very dependent on vagal innervation. The dorsal nucleus of the vagus nerve originates from the brainstem and would be subject to pressure if there was a vertebral misalignment at that level.

Though it is doubted that actual bone-on-nerve pressure occurs often in the spine, it is highly suspected that torsional changes to the dural structures will cause abberrent nerve conduction.[17]

Having close proximity to the brain, the thalamus and limbic systems are also affected to some degree as well. There have been recent studies that show a link to the limbic system and a correlation between visceral hypersensitivity syndromes, like IBS, and emotional disorders like depression and anxiety.[18]

An Australian survey consisting of 1,567 chiropractic patients showed a link between GI disturbances and back pain. Of the patients surveyed 57% reported GI complaints, and 46% reported complaints of GI disorders and back pain, with 36% of these patients reported both symptoms at the same time. Twenty-two percent of these patients seeking care for the musculoskeletal complaint found relief of their GI complaint as well; the majority of patients who found relief of their intestinal complaints suffered from mid-back pain.[19]

In yet another study conducted by Takeda, et al, 57 patients with Crohn's disease and allergies were evaluated for the long-term remission of symptoms under chiropractic care. Of the 17 patients receiving adjustments to reduce vertebral subluxations 12 showed long-term remission. The study noted subluxation as a common characteristic in both Crohn's disease and allergies.[20]

Other evidence of vertebral subluxation leading to visceral conditions of the GI tract is reported in a case study presented by Blum. This patient was suffering from chronic ulcerative colitis and infertility. The 32-year-old woman experienced relief from her colitis and subsequently became pregnant after 7 years of fertility treatments by her MD. [21].

Mahanidis, Russell and Russell provide a case of a woman suffering from depression with symptoms of IBS under chiropractic care. This study provides a larger body of evidence than most other cases found and utilized surface EMG, thermography, quality of life and health surveys. Over the 7 months of care the patient showed a decrease in symptoms relating to both mood and digestion, and increase in overall wellness scores and decrease in paraspinal thermal asymmetries.[22] There was also a correlation made between cervical trauma and mood disorders, as described by Jelinksi et al. [23]

Subluxation model explained

There are several models used to describe a vertebral subluxation put forth by the chiropractic community. All models try to explain the relationship between the spine and some form of dysfunction. This case supports the use of the upper cervical model of subluxation and this is what the care plan was based on for this patient.

BJ Palmer stated, "No vertebral subluxation can exist below axis; therefore no adjustment with any direct intention or design could be given below an axis, to get sick people well." [24] Grostic's *Dentate Ligament Theory* is based on this idea, and it is supported by basic science. The theory is that any malposition of the upper cervical vertebrae will cause pressure on the brainstem, causing interference with autonomic regulation of the body.

Yet another important factor about the subluxation of the upper cervical spine is the influence on the vagus nerve. According to Simecka et al, by removing rotation of atlas, there was a greater amount of vagal tone in a control group.[25]

The vagus ganglion is located inferior to the foramen magnum and subject to dural torsion caused by the attachment of the dentate ligaments. This pressure or irritation on the vagus nerve would have an effect on parasympathetic output.

Conclusion

A misplacement of the occipital-atlanto-axial joint appears to cause neurological interference resulting in dysregulation of the autonomic nervous system. This change in neurology could possibly change the chemical and electrical signals to the enteric nervous system. Correcting the misalignment at this level restores proper neurological function and thereby proper function of the gastro-intestinal track. Larger studies are warranted to further explore this theory.

References

1. El-Salhy M, Lillebø E., et al. Effects Of A Health Program Comprising Reassurance, Diet Management, Probiotics Administration And Regular Exercise On Symptoms And Quality Of Life In Patients With Irritable Bowel Syndrome, Gastroenterology Insights 2010. 2 (6) 21-26.
2. Burr RL, Jarrett ME, et al. Catecholamine And Cortisol Levels During Sleep In Women With Irritable Bowel Syndrome. Neurogastroenterol Motil (2009) 21, 1148–e97
3. Drossman DA, Morris CB, Schneck S, et al. International Survey Of Patients With IBS: Symptom Features And Their Severity, Health Status, Treatments, And Risk Taking To Achieve Clinical Benefit. J Clin Gastroenterol 2009;43:541-50.
4. NIH Publication No. 07–693. September 2007 (Not copyrighted – Used with permission)
5. Talley NJ. Functional gastrointestinal disorders: irritable bowel syndrome, dyspepsia, and noncardiac chest pain. In: Goldman L, Ausiello D, eds. Cecil Medicine. 23rd ed. Philadelphia, Pa: Saunders Elsevier; 2007:chap 139.
6. Vanner S, Surprenant A. Neural reflexes controlling intestinal microcirculation. Am J Physiol 1996 Aug; 271(2 Pt 1): G223-30.
7. Tomita R, Munakata K, Tanjoh K. Role of non-adrenergic non-cholinergic inhibitory nerves in the colon of patients with ulcerative colitis. J Gastroenterol 1998 Feb; 33(1): 48-52.
8. Guyton A, Hall J. Textbook of Medical Physiology Philadelphia, PA: Elsevier Saunders, 2006 (749-754).
9. Goldberg G. Thermography and magnetic resonance imaging correlated in 35 cases. Thermology 1986; 1: 207-11.
10. Thomas D, Cullum D, Siahamis G. Infrared thermographic imaging, magnetic resonance imaging, CT scan and myelography in low back pain. Br J Rheumatol 1990; 29: 268-73.
11. Weinstein SA, Weinstein G. A clinical comparison of cervical thermography with EMG, CT scanning, myelography and surgical procedures in 500 patients. Proceedings of the 1st annual meeting of the academy of Neuromuscular Thermography; 1985 May. Postgrad Med 1986; Special ed:44-6.
12. Uematsu S. Symmetry of Skin Temperature Comparing One Side of the Body to the Other. Thermology 1985;1:4-7.
13. Feldman F, Nicoloff E. Normal thermographic standards in the cervical spine and upper extremities. Skeletal Radiol 1984; 12: 235-249.
14. Clark RP. Human skin temperatures and its relevance in physiology and clinical assessment. In: Francis E, Ring J, Phillips B, et al. Recent advances in medical thermology. New York: Plenum Press, 1984, 5-15.
15. Palmer BJ. The Subluxation Specific, The Adjustment Specific. Vol. 18, Spartanburg, SC: Kale Foundation, 1991.
16. Kale M, Keeter T. A Mechanical Analysis of the Side Posture and Knee-Chest Specific Adjustment Techniques. J Vert Sublux Res 1997. 1 (3), 1-7.
17. Grostic J. Dentate Ligament – Cord Distortion Hypothesis. Chiropractic Research Journal 1988 Vol. 1(1) ,47 – 55.
18. Karantanos T, Markoutsaki T, et al. Current Insights In To The Pathophysiology Of Irritable Bowel Syndrome. Gut Pathogens 2010, 2:3
19. Bryner P, Staerker PG. Indigestion and Heartburn: A Descriptive Study of Prevalence in Persons Seeking Care from Chiropractors. J Manipulative Physiol Ther 1996 (Jun); 19 (5): 317–323
20. Takeda Y, Arai A, et al. Long Term Remission and Alleviation of Symptoms in Allergy and Crohn's Disease Patients Following Spinal Adjustment for Reduction of Vertebral Subluxations. J Vert Sublux Res 2003 (Mar); 4 (4): 129-141
21. Blum C. The Resolution of Chronic Colitis with Chiropractic Care Leading to Increased Fertility. J Vert Sublux Res 2003 (Aug 31); 4 (4): 1-5
22. Mahanidis T, Russell B, Russell D. Improvement in Quality of Life in a Patient with Depression Undergoing Chiropractic Care Using Torque Release Technique: A Case Study. J. Vert Sublux Res. January 31, 2010, 1-6
23. Jelinski SE, Magnusson JE, Becker WJ. Factors associated with depression in patients referred to headache specialists. Neurology. 2007 Feb 13;68(7):489-95.
24. Palmer BJ. The Subluxation Specific, The Adjustment Specific. Vol. 18, Spartanburg, SC: Kale Foundation, 1991. Pg 176.
25. Simecka J, Coleman D, Spencer J, Lester S, MacWorter G, Colye B. The Effect of Specific Upper Cervical Manipulation on Vagal Tone. The 14th Annual Biomechanics Conference on the Spine. Nov 5-6, 1983. 389-404.

Figures

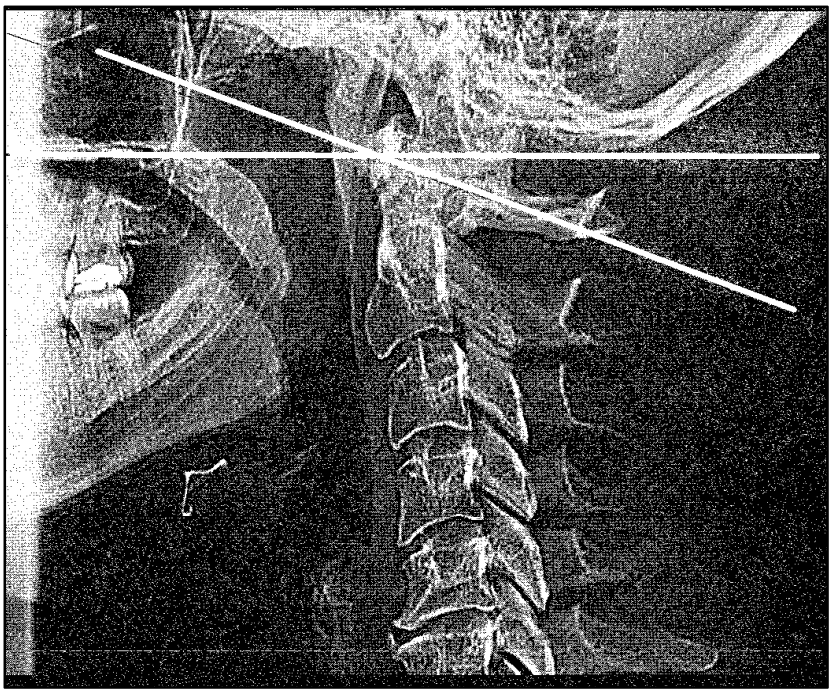

Figure 1. Lateral cervical view. Computer-enhanced lines of mensuration showing a C1 malposition of 22º. Note the formation of IVOC at the C5-C6 endplate.

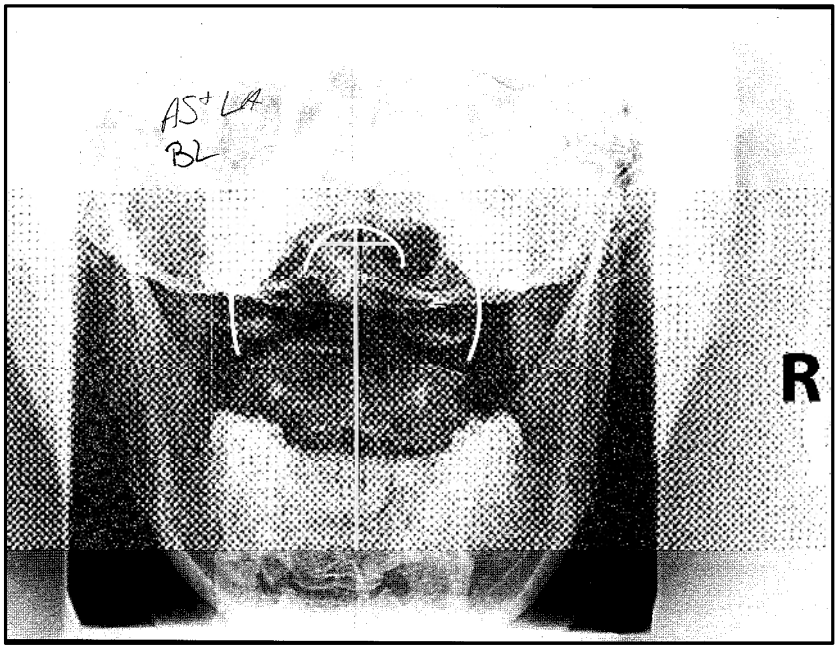

Figure 2. AP-Open Mouth view. This was to assess the laterality of the C1 and C2. Lines are enhanced, and show atlas and axis in relation to the foramen magnum.

Figure 3. Vertex view. Assessing C1 to the Foramen Magnum, to analyze for rotation. Here we can see an acute angle on the left side; Atlas has rotated 10º to the anterior.

Thermography Scans (Figure 4-8)

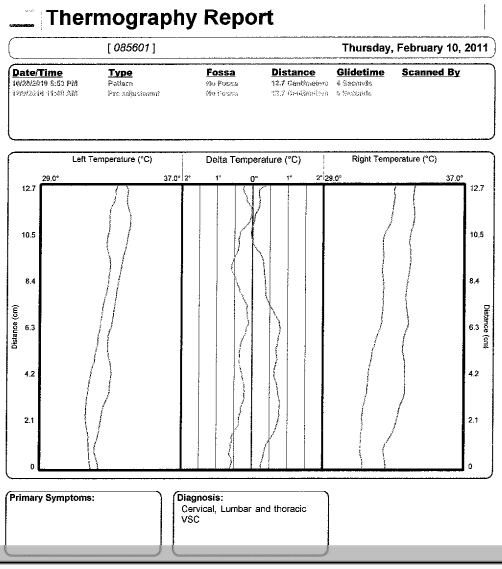

Figure 4. Paraspinal thermographic pattern. "Pattern" was established after finding 3 similar scans at least 20 minutes apart. This pattern is the prerequisite for whether the patient required an adjustment or not; Taken at second adjustment.

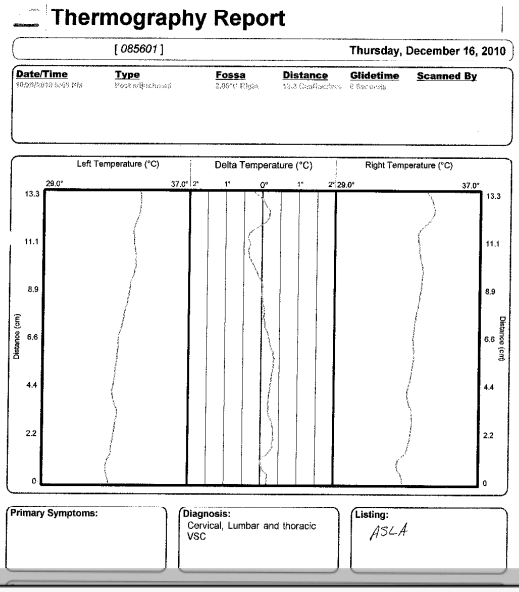

Figure 5. Post-adjustment scan showing a reduction in asymmetry from pattern.

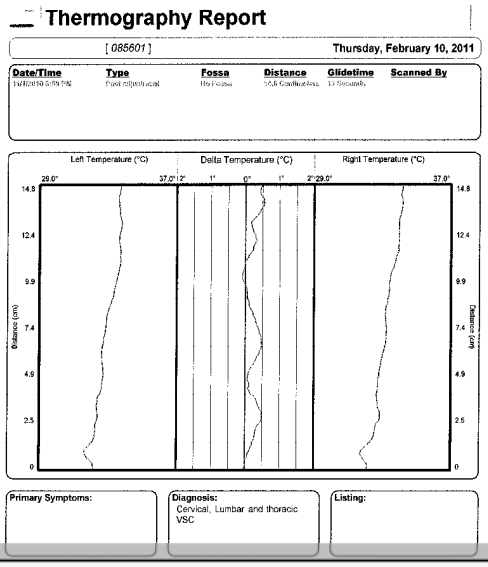

Figure 6. Post-adjustment scan, showing a greater reduction in thermal asymmetry from pattern.

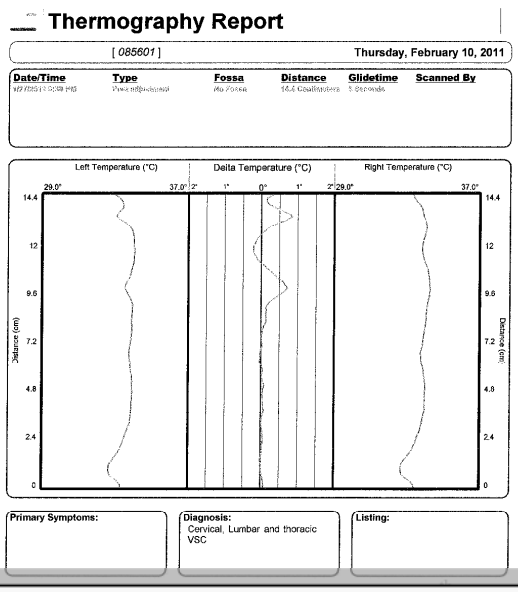

Figure 8. Post-adjustment scan taken on 12th visit. Patient had complaints of mood disorder, and was asymptomatic for IBS.

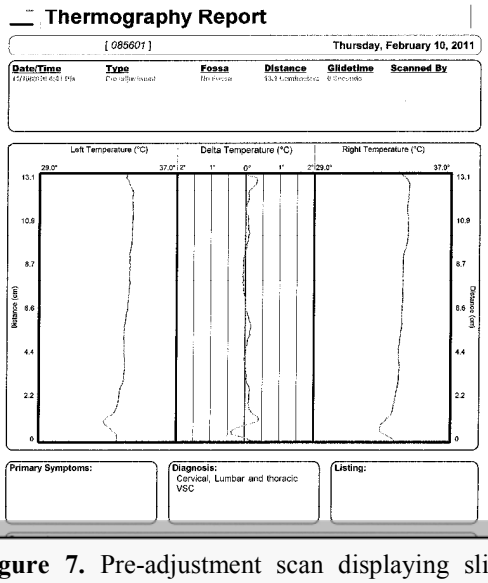

Figure 7. Pre-adjustment scan displaying slight thermal asymmetry. No adjustment was given on this visit.