

CASE STUDY

Applied Kinesiology Management of Candidiasis and Chronic Ear Infections: A Case History

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Abstract

Objective: To describe the use of Applied Kinesiology (AK) in the management of a pre-adolescent female with candidiasis, recurrent ear infections, and severe postural imbalances that occurred when these infections were present.

Clinical Features: This six-year-old patient had painful earaches on a monthly basis since the age of 4-months. She had undergone antibiotic treatment 25 times in her life, suffered two urinary tract infections, and displayed oral thrush. Exposure to water and cold air consistently produced an ear infection according to her parents.

Intervention & Outcome: AK methods were utilized to diagnose and treat this patient with rapid resolution of her candidiasis, ear pain in cold air and water, and ear infections. She has been symptom-free for 2 years since her first 4 AK treatments over a three-month period.

Conclusion: In this case a multi-modal chiropractic system for the evaluation of muscle-joint subluxations were useful for the discovery of a number of complex causative factors underlying this patient's digestive and immune system compromise, as well as her recurring infections and earaches.

Key Words: *Candidiasis, chiropractic, vertebral subluxation, Applied Kinesiology, ear infections*

Introduction

Acute otitis media, AOM, is the most common childhood complaint in which many children suffer multiple episodes during the first years of life. Although the most common treatment for this condition has historically been the administration of antibiotics, for which prescriptions are written worldwide,¹ there are numerous problems with this intervention. Among these are the facts that (a) over half or

more of ear infections may not even be caused by bacteria,² (b) bacterial resistance may be expected to increase with widespread application of antibiotics,³ (c) undesirable side effects may accompany the use of antibiotics,⁴ (d) clinical research has indicated that the effectiveness of antibiotics in managing AOM is limited and that antibiotics should not be routinely prescribed at the first visit,⁵ and (e) prescribing methods for antibiotics in managing AOM have been shown in some instances to be anything but scientific.⁶

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Recurrent candidiasis, an overgrowth of the yeast *Candida albicans* throughout the intestinal tract, including the sinuses and ears, and/or the vagina, is common in people who are immune-compromised and who have undergone repeated antibiotic therapy.¹ As the problem of candidiasis progresses, in both males and females, the yeast often spreads to the mouth, larynx, and pharynx, as well as to the stomach and esophagus. When candidiasis is actively present in the system at the same time as an infectious agent, the toxicity of the latter is greatly enhanced and can result in fatal toxic shock syndrome.¹

Several modern drugs are effective against candida infection and side effects are minimal when used orally, especially if only a single dose is prescribed. However, as in this case, the drugs are frequently used repeatedly and are not used with a comprehensive antifungal approach that would encourage a healthier digestive tract and immune system.

Regarding the mechanism of AOM, deficits in eustachian tube function may impede normal drainage of the ear to the nasopharynx and thereby creating a negative pressure within the middle ear as compared to atmospheric pressure. This negative pressure may permit the inhalation or reflux of nasopharyngeal contents into the middle ear. Upper cervical subluxations and muscle imbalances are important physiological factors in cases of head pain and earache, and are often ignored when therapy involves using antibiotics alone.^{2, 3} Yet manipulation of the upper cervical region has been found to lead to the rapid resolution of AOM.⁷⁻⁹

Case Report

History

A six-year-old female presented with a chief complaint of recurrent AOM, oral thrush, fatigue, and immune-system compromise. The child acquired an AOM on a monthly basis, and invariably after exposure to cold wind and/or water, so much so that she never went swimming and always wore a beret that covered her ears when she went outdoors.

When she suffered AOM she would lose her balance, walk into walls, and constantly cough. The latter symptom was an indication to her parents that an ear infection was beginning and that a visit to her pediatrician was called for. These problems had been treated with 25 rounds of antibiotic therapy since the patient was 4 months of age until her presentation for treatment.

Examination per Applied Kinesiology Protocol

The methods used in AK for the investigation of digestive dysfunctions and the viscerosomatic or visceromuscular reflexes involved in these cases have been described previously.¹⁰ Applied Kinesiology suggests that subluxations might result from 3 areas of concern, which comprise chemical and mental elements in addition to structural.¹¹ AK recognizes how nutritional,¹² hormonal,^{13, 14} and emotional^{15, 16} elements influence neural function as reflected by muscle tone that is evaluated by an established muscle testing protocol^{17, 18} whose reliability and validity have recently been shown.¹⁹

Applied Kinesiology essentially sees muscle function as a transcript of the central integrative state of the anterior horn motoneurons, summing all excitatory and inhibitory inputs.²⁰ In other words, the locus of dysfunction ultimately rests with the nervous system, which brings us back to D.D. Palmer and his concept of "tone". Thus, AK advocates a multi-model program with treatment inclusive of spinal adjustment for subluxations, cranial manipulative therapy, specific muscle testing and correction, biochemical evaluation and treatment, and psychosocial evaluation and treatment in order to improve muscle dysfunction, reflective of neural dysfunction, throughout the body in a holistic way.

Applied Kinesiology, AK, methods are utilized for diagnosis and correction according to the findings. (See Table 1) In AK, diagnosis of a dysfunction moves seamlessly toward correction because the challenge and/or therapy localization methods guide the clinician toward the most effective therapy for the diagnostic finding, inhibition during manual muscle testing, or MMT.

In AK, once the dysfunctional muscle has been identified with the MMT, several treatment options are open to the doctor. The option, whether adjustive, myofascial, reflex, nutritional, meridian, or cranial-sacral related, most effective in restoring strength to the inhibited muscle, using the challenge and therapy localization test procedures, indicates the best treatment for the patient.¹¹ (See Appendix 1)

Intervention

In this case AK challenge to the TMJ, to the reflex areas LI-4 (large intestine 4, the so-called "Source point" for the large intestine meridian in Traditional Chinese Medicine) and to the thymus gland reflex area produced an immediate weakening in all indicator muscles. Manipulation to the lateral and medial pterygoid muscles and insalivation of nutritional supports corrected the muscular impairments that formerly resulted from challenge to the TMJ and the LI-4 areas. The nutritional products were from the nutritional company Nutri-West™ and are called *Spore-X* and a probiotic called *Lacto-Plus*, which have been effective in previous cases of *Candidiasis* treated by SCC.²¹

A number of recent published reports have demonstrated the effectiveness of the AK system of analysis for acupuncture system, digestive system, craniosacral, viscerosomatic, and visceromuscular dysfunctions.¹⁹ Manual corrections of myofascial trigger points in the lateral and medial pterygoid muscles, as was done in this case, have been shown to resolve ear pain.^{22, 23} Muscle imbalances affecting the medial pterygoid may compromise the diameter of the eustachian tube and affect its patency and drainage potentials.

Mense and Simons also suggest that the recognition of the muscle weakness caused by MTRPs is often a critical step in the restoration of normal function. Other muscles suffer from compensatory overload due to the inhibition created by the MTRPs in the inhibited muscles in their view.²³ After one minute of percussion upon the MTRPs in the medial and lateral pterygoid muscles, the AK challenge and therapy localization tests for jaw movement became negative, and pressure on the MTRPs that previously produced referred pain into her ear and

lateral face no longer occurred.

It is thought that the immediate effect of percussion is to modify the physical nature of the myofascial matrix.^{22, 24} Percussion may also press fluid from the nuclear bag of the muscle spindle cells, part of the MTrPs pathophysiology, reducing the tension in the capsule of the spindles.^{23, 24} Addressing soft tissue, upper cervical, and cranial dysfunctions, with CMT appeared to facilitate a return of normal eustachian tube function in this child. (Figures 1-6)

Outcome

The first consultation, examination and treatment lasted for 1 hour. After 4 visits (over a 3 month period) the patient's oral thrush, ear aches and ear infections and their associated muscular imbalances were resolved. It was now possible to expose the patient's ears to cold air and/or water without complaint. The patient's distressing 5 ½ years of ear infections, oral thrush, and immune system compromise have not returned for the past 2 years.

Conclusion

Successful management guided by AK MMT methods (involving biomechanical, biochemical, and meridian system factors in the treatment) for a 6-year-old child with a 5 ½ year history of recurrent ear infections, candidiasis, and immune system susceptibility is presented. Four treatments that consisted in the analysis of muscular impairments (inhibition on MMT) and their relationship to articular, soft tissue, and nutritional disorders that were treated with chiropractic adjustments, resulted in elimination of the muscle weaknesses found and elimination of 5 ½ years of previous suffering.

Many of these muscular and viscerosomatic impairments have been shown to be reversible: improvements in muscle function after CMT has been documented in the literature.^{19, 25} Applied to the general pediatric population with ear infections and oral thrush, strategies designed to optimize muscle strength and associated neurophysiologic components may have the potential to reduce a vast burden of disability, dependence, and cost.

References

1. Leibovitz E, Broides A, Greenberg D, Newman N. Current management of pediatric acute otitis media. *Expert Rev Anti Infect Ther.* 2010 Feb;8(2):151-61.
2. Pitkaranta A, Jero J, Arruda E, Virolainen A, Hayden FG. Polymerase chain-reaction based detection of rhinovirus, respiratory syncytial virus, and coronavirus in otitis media with effusion. *Journal of Pediatrics* 1998; 133(3):390-394.
3. Whitney CG, Farley MM, Hadler J, Harrison LH, Lexau C, Reingold A, Lefkowitz L, Cieslak PR, Cetron M, Zell CR, Jorgensen JH, Schuchat A, Active Bacterial Core Surveillance Program of the Emerging Infections Program Network. Increasing prevalence of multidrug resistant *Streptococcus pneumoniae* in the United States. *New England Journal of Medicine* 2000; 343(26): 1917-1924.
4. Wickens K, Pearce N, Crane J, Beasley R. Antibiotic use in early childhood and the development of asthma. *Clinical and Experimental Allergy* 1999; 29(6): 766-771.
5. Damoiseaux RAMJ, van Balen FAM, Hoes AW, Verheij TJM, de Melker RA. Primary care based randomized double blind trial of amoxicillin versus placebo for acute otitis media in children aged under 2 years. *British Medical Journal* 2000; 320(7231): 350-354.
6. Mangione-Smith R, McGlynn EA, Elliott MN, Krogstad P, Brook RH. The relationship between perceived parental expectations and pediatrician antimicrobial prescribing behavior. *Pediatrics* 1999; 103(4 Pt1): 711-718.
7. Froehle RM. Ear infection: A retrospective study examining improvement from chiropractic care and analyzing for influencing factors. *Journal of Manipulative and Physiological Therapeutics* 1996; 19(3): 169-177.
8. Fallon J, Edelman MJ. Chiropractic care of 401 children with otitis media: A pilot study. *Alternative Therapies in Health and Medicine* 1998; 4(2): 93.
9. Mills MV, Henley CE, Barnes LLB, Carreiro JE, Degenhardt BF. The use of osteopathic manipulative treatment as adjuvant therapy in children with recurrent acute otitis media. *Archives of Pediatrics and Adolescent Medicine* 2003; 157(9): 861-866.
10. Caso ML. Evaluation of Chapman's neurolymphatic reflexes via applied kinesiology: a case report of low back pain and congenital intestinal abnormality. *J Manipulative Physiol Ther.* 2004 Jan;27(1):66.
11. Walther, DS. *Applied kinesiology synopsis.* 2nd Edition. Pueblo, CO: Systems D.C.; 2000.
12. Schmitt WH Jr, Leisman G. Correlation of applied kinesiology muscle testing with serum immunoglobulin levels for food allergies. *Intern J Neuroscience* 1998;96(3-4):237-244.
13. Shealy CN. Total life stress and symptomatology. *J Holist Med.*6(2):112-129.
14. Seyle S. *The Stress of Life.* New York, NY: McGraw-Hill Book Company;1956.
15. Hechter AO, Grossman A, Chatterton RT Jr. Relationships of dehydroepiandrosterone and cortisol in disease. *Med Hypoth.* 1997;49:85-91.
16. Lately P. Feelings, muscles and movement. *J Bodyw Mov Ther.*1(1):44-52. <http://www.ncbi.nlm.nih.gov/pubmed/>.
17. Kendall HO, Kendall FP. *Posture and Pain,* Williams & Wilkins, Baltimore, MD, 1952.
18. Janda V. *Muscle Function Testing.* London: Butterworths; 1983.
19. Cuthbert SC, Goodheart GJ Jr. On the reliability and validity of manual muscle testing: a literature review, *Chiropr Osteopat.* 2007 Mar 6;15(1):4.
20. Schmitt WH Jr, Yanuck SF. Expanding the neurological examination using functional neurological assessment. Part II: Neurological basis of applied kinesiology. *International Journal of Neuroscience* 1998; 97(1-2).
21. Nutri-West. <http://www.nutriwest.com/home/index.htm>
22. Travell JG, Simons DG. *Myofascial Pain and Dysfunction: The Trigger Point Manual.* Baltimore, MD: Williams & Wilkins, 1983:103-164.
23. Mense S, Simons DG. *Muscle Pain: Understanding Its Nature, Diagnosis, and Treatment.* Lippincott Williams & Wilkins; Philadelphia. 2001.
24. Cuthbert S. Applied Kinesiology and the Myofascia. *Int J AK and Kinesio Med,* 2002;13.

25. Smith DL, Cox RH. Muscular strength and chiropractic: theoretical mechanisms and health implications. *J Vertebral Subluxation Res.* 1999-2000; 3(4).
26. Liebenson C. Ed: *Rehabilitation of the Spine: A Practitioner's Manual*, 2nd ed. Philadelphia, PA: Lippincott, Williams & Wilkins; 2007.
27. Lewit K: *Manipulative Therapy in Rehabilitation of the Locomotor System*, 3rd ed. London, United Kingdom: Butterworths, 1999.
28. Hammer WI, Ed: *Functional Soft Tissue Examination and Treatment by Manual Methods*, 2nd Ed. Gaithersburg, MD: Aspen Publishers. 1999:415-445.12, 27-33.
29. Sahrman S: *Diagnosis and Treatment of Movement Impairment Syndromes*. St. Louis, MO: Mosby, Inc. 2001.
30. Bergmark A: Stability of the lumbar spine. A study in mechanical engineering. *Acta Orthop Scand* 1989;230:20-24.
31. American Medical Association: *Guides to the Evaluation of Permanent Impairment*, 5th Edition, 2001:510-511.
32. Cuthbert SC, Barras M. Developmental delay syndromes: psychometric testing before and after chiropractic treatment of 157 children. *J Manipulative Physiol Ther.* 2009;32(8):660-669.
33. Cuthbert S, Blum C. Symptomatic Arnold-Chiari malformation and cranial nerve dysfunction: a case study of applied kinesiology cranial evaluation and treatment. *J Manipulative Physiol Ther.* 2005;28(4):e1-6.
34. Goodheart GJ: *Applied Kinesiology Research Manuals*. Detroit, MI: Privately published; 1964-1998.
35. Pollard HP, Bablis P, Bonello R: The ileocecal valve point and muscle testing: A possible mechanism of action. *Chiropr J Aust* 2006;36(4):122-126.
36. Guyton AC. *Textbook of Medical Physiology*. Philadelphia, PA: WB Saunders;1991:583.
37. Mattes RD. Physiologic responses to sensory stimulation by food: nutritional implications. *J Am Diet Assoc.* 1997;97:406-413.
38. Barton J, Barton M. *Which Vitamin? Nutritional Care through Muscle Testing*. E. Longmeadow, MA:1979.
39. IMPAC, Inc. PO Box 535 Salem, OR 97308. <http://www.impactinc.net>.

Table 1 -- AK Examination Findings and Proper Corrective Treatment

AK examination finding	Corrective Treatment/Outcome
<ul style="list-style-type: none"> • Sternocleidomastoid (SCM) on the left and anterior scalene muscles inhibited bilaterally 	<ul style="list-style-type: none"> • Right inspiration, left expiration assist cranial fault corrections to the temporal bones bilaterally (strengthened SCM on left and anterior scalene bilaterally)
<ul style="list-style-type: none"> • Positive therapy localization (TL) and challenge (producing inhibition to previously strong indicator muscles) to the left TMJ on sagittal opening of the jaw 	<ul style="list-style-type: none"> • Strain-counterstrain and percussion used on the medial and lateral pterygoid muscles (this muscle surrounds the eustachian tube) and abolished challenge and TL to the left jaw on sagittal opening ¹² (See Figures 3 & 4)
<ul style="list-style-type: none"> • Positive challenge (producing inhibition to previously strong indicator muscles) for a category I pelvis with a right posterior ilium 	<ul style="list-style-type: none"> • SMT pelvis (DeJarnette wedges) abolished challenge to the pelvis and strengthened the left hamstring muscle
<ul style="list-style-type: none"> • Positive TL to acupuncture point Large Intestine 4 (LI-4) (TL to LI-4 produced inhibition in previous strong indicator muscles) 	<ul style="list-style-type: none"> • Insalivation of a probiotic corrected positive TL to LI-4 (See Appendix I)
<ul style="list-style-type: none"> • Positive TL to neurolymphatic reflex (NL) for the thymus gland (produced inhibition in previous strong indicator muscles) 	<ul style="list-style-type: none"> • Insalivation of an immune system supportive nutrient corrected positive TL to the NL for the thymus gland
<ul style="list-style-type: none"> • Bilaterally inhibited gluteus maximus muscles 	<ul style="list-style-type: none"> • SMT for upper cervical fixations strengthened gluteus maximus muscles bilaterally (See Figures 1 & 2)

Appendix I -- Glossary of Applied Kinesiology Terms Used

Manual Muscle Test -- The actual testing of the muscle had been previously and firmly established by Kendall and Kendall,¹⁷ who held that a muscle from a contracted position against increasing applied pressure could either maintain its position (rated as "facilitated" or "strong") or break away and thus be rated as "inhibited" or "weak". The testing of muscle strength itself has been widely practiced in manual medicine for decades by such authorities as Daniels, Worthingham, and the use of the MMT for functional conditions continues today with the work of Goodheart, Janda, Chaitow, Sahrman, Bergmann, Lewit, Liebenson, and Hammer.^{18, 26-30} The American Medical Association has accepted that the standard method of MMT used in AK is a reliable tool and advocates its use for the evaluation of disability impairments.³¹ According to this rating system, a grade 5 MMT is normal muscle strength, demonstrating a complete (100%) range of movement against gravity, with firm resistance offered by the practitioner. Grade 4 is 75% efficiency in achieving range of motion against gravity with slight resistance with decreasing increments of 25% efficiency with each lower grade to a minimum of 0. Muscles graded 4 or less were considered weakened, warranting interventions as described in the report.

Challenge -- A diagnostic procedure unique to AK that is used to determine the body's ability to cope with external stimuli, which can be physical, chemical, or mental. Cranial and vertebral challenge has been described in the literature previously.^{11, 32-34} After an external stimulus is applied, muscle-testing procedures are done to determine a change in the muscle strength as a result of the stimulus. Through this approach, ineffective therapies that produced no improvements in muscle strength were rejected, and only those that elicited a positive muscle response were used. This guided the treatments given to the patient.

"Weak" muscle -- A muscle that may or may not develop full power, but on MMT it does not neurologically function at its full capacity. Preferable terms for muscles that test weak or strong are termed conditionally inhibited and conditionally facilitated, respectively.

Appendix I -- Glossary of Applied Kinesiology Terms Used cont

Therapy localization -- A diagnostic procedure unique to AK that consists of placing the patient's hand over areas of suspected involvement and observing for a change in the MMT. This method assists the doctor in rapidly finding areas that are involved with the muscle dysfunction found on MMT and has been used clinically for over 30 years.^{11, 34} Pollard et al in a recent literature review outlined research supporting the AK concept of therapy localization.³⁵ Collectively these data suggest that stimulating or stabilizing the muscles, joints, ligaments, and skin -- and their associated cutaneomotor reflexes -- can produce changes in muscle function.

Indicator muscle -- A muscle tested to determine if there is a change in its strength as a result of some testing mechanism (challenge or therapy localization, for instance) applied to the body. Generally an indicator muscle is strong prior to the test, and weakens as a result of the testing procedure.

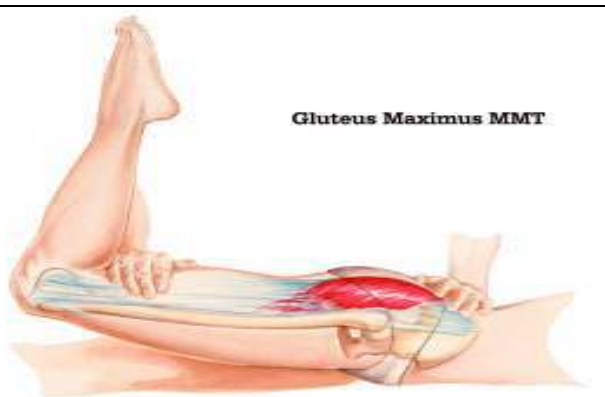
Myofascial trigger points (MTrPs) -- According to Leibenson²⁶ the combination of muscular inhibition, joint dysfunction and trigger point activity is the key peripheral component leading to functional pathology of the motor system. In AK, the presence of myofascial trigger points can be objectively identified using the muscle stretch procedure that produces detectable changes in muscle strength on MMT.^{11, 22-24, 34} The percussor instrument was used to deactivate the myofascial trigger points in these muscles. (Figures 3, 4 and 6)

Oral nutrient evaluation -- In this case report, "insalivation" of the nutritional supplement for this patient refers to the fact that the taste buds on the tongue can detect extremely small concentrations of substances within a fraction of a second.³⁶ Oral nutrient evaluations are used clinically in AK in the assessment process. Exposure to taste elicits a variety of neurological, muscular, digestive, endocrine, cardiovascular, thermogenic, and renal responses.³⁷ The relationships between muscle function and specific nutritional deficiencies have been described by Travell and Simons.²² The nerve pathways causing change in muscle function as observed by MMT are still unclear; however, there is considerable evidence in the literature of extensive efferent function throughout the body from stimulation of the gustatory and olfactory receptors with actual insalivation³⁶ rather than merely the contact of a substance with the hand or belly as often taught and erroneously labeled AK by some practitioners.³⁸

Influence of cranial faults upon the sternocleidomastoid and anterior scalene muscles

Cranial faults -- Involve the failure of the skull to move in its normal, rhythmic manner, as discovered by Sutherland and Cottam and researched by many others. The open border between the jugular process of the occiput and the petrous portion of the temporal bone begins at the jugular foramen, and this area remains open throughout life. (Figure 5) It is not actually a sutural joint or articulation at all but a kind of extended crevice. It has been remarked by many researchers in the cranial field that at the very center of the cranial base two of the main bony structures do not articulate along a part of their common border -- an architectural arrangement that maximizes malleability and motion. This open architectural design at the jugular process and the petrous temporal makes the cranial base portion of the temporal and the occiput vulnerable to displacement, because they lack the mutual bracing of a suture.

Figures 1 & 2 -- An upper cervical fixation correction strengthened bilaterally inhibited gluteus maximus muscles.^{11,34}



Figures 3 & 4 – Treatment of the medial pterygoid muscle.

The medial pterygoid muscle is in close approximation to the eustachian tube. Extrinsic obstruction of the eustachian tube can result from cranial faults and/or TMJ disturbances to the soft-tissue attachments of the tube. Myofascial trigger points in the medial pterygoid muscle can refer pain into the ear.^{11,22}

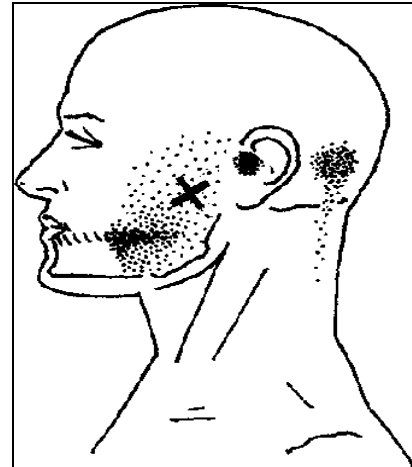
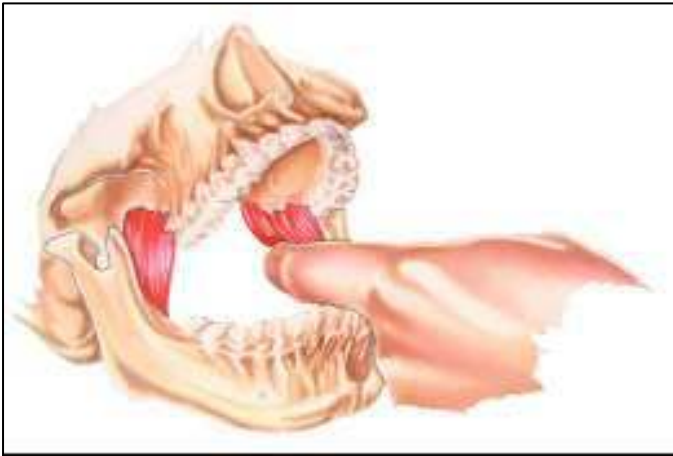


Figure 5 – The jugular foramen is located between the petrous portion of the temporal bone and the jugular process of the occipital bone. (Appendix I) In this patient's case, cranial nerve XI and its motor supply to the left sternocleidomastoid and anterior scalene muscles bilaterally were improved by treatment to these two bones.



Figure 6 –The Percussor instrument (from IMPAC) used to deactivate myofascial trigger points and improve muscle tone. ³⁹

