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# ABSTRACT FORM
## SECOND WORLD CONGRESS ON PAIN of the INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN
(Montreal, Canada—August 27 to September 1, 1978)

DEADLINE: **Deadline for receipt of abstracts in Los Angeles is JANUARY 15, 1978**
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CRANIAL SUTURE MORPHOLOGY. E.W. Retzlaff, J.E. Upledger & J.D. Vredevoogd.

Dept. of Biomechanics, College of Osteopathic Medicine, Michigan State University, E. Lansing, MI 48824, USA.

The sutures of the cranial bones in primates, including man, consist of a highly vascularized matrix of connective tissue. The most prominent connective tissue consists of bundles of collagen fibers which seem to have a random pattern of distribution but can be traced from one cranial bone to the opposite bone. Frequently, these bundles penetrate the bone, as Sharpey's fibers, where they end in a fimbriated pattern. The collagenous bundles may display a wavy pattern in some parts of the suture which suggest that they are in a contracted state. A second type sutural connective tissue is a reticulum which accompanies the collagenous bundles throughout the suture and also penetrates the bone as a part of the Sharpey's fiber system. These reticular fibers may serve to anchor the Sharpey's bundles in the bone. Elastin tissue is also evident in the sutures. In addition to the usual elastic membranes of the blood vessels some of them appear to wind around the capillaries. Other elastic fibers are evident along the surface of the collagenous bundles. In areas where the elastic fibers zig-zag along the collagen bundles, it is possible that they provide a contractile mechanism to shorten them.

There are 5 types of nerve fibers entering the parieto-parietal suture which appear to have traversed the wall of the superior sagital sinus before entering the suture proper. Individual nerve fibers separate from the bundle and follow the blood vessels through the suture. 1) Some extend outward and in all probability terminate in the scalp. 2) Some accompany the collagenous bundles and enter the bone with the Sharpey's fibers, which follow the Haversian canal system. 3) Some fibers appear to end around the base of the penetrating Sharpey's fiber bundle. 4) Some terminate as Golgi tendon organs. 5) There are free-endings on the blood vessels.

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1978 American Osteopathic Association Research Conference

March 16-18, Chicago, Illinois

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E.W. Retzlaff

6. Title: Temporalis Muscle Action In Parieto-Temporal Suture Compression.

7. Abstract

The muscles of mastication in primates are a powerful group which move the mandible in acts of biting, chewing and vocalization. The temporalis muscle is the largest of the group. In humans it originates, as a wide fan shaped muscle, from a broad band along the posterior and superior portions of the temporal fossa, which are on the parietal and frontal bones, respectively. In some primates, it originates higher, and more extensively, on the parietal bone. It narrows to form a tendinous insertion on the coronoid bone surface and the anterior border of the mandible near the last molar. Its anterior fibers serve to close the mouth. The posterior fibers draw the mandible posteriorly. The above description has been abstracted from Gray's Anatomy, 35th British edition, Saunders Phil. 1973, (page 501), considers only mandibular movement as the function of the temporalis muscle. Our study of the gross and micro architectural design indicates that when the teeth are tightly approximated contraction of the temporalis will draw the parietal bone downward. The parieto-temporal suture is classified as a squamous type which permit the two surfaces to slide upon each other. Accordingly the nerve fibers and vasculature will be compressed when the temporalis contracts. It is known that an area which is ischemic will become painful due to the local effect on the sympathetic (autonomic) perivascular plexus. Also, the Golgi type IV sensory endings in the suture will be compressed, which will contribute to localized and more distant referred pain. In an earlier paper (Retzlaff et al, JAOA 73:53-63, 1974) it was suggested that compression of nerve fibers and/or blood vessels by contracture of the piriformis muscle will cause either localized and/or distant referred pain. Supported in part by grants from the AOA Bureau of Research, The Cranial Academy, and BS-GRS.

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INSTRUCTIONS FOR ABSTRACT FORM FOR THE 1978 AOA RESEARCH CONFERENCE

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Read instructions throughly before you begin to type this special form. The opposite side of this form is for the identification information and abstracts for the 1978 American Osteopathic Association Research Conference. This information will be reproduced for the conference program books. Remember that the abstract will appear in the program exactly as you submit it; any errors, erasures, smudges, misspellings, poor hyphenations and deviations from good usage will be glaringly evident. Follow all instructions below to the letter and supply all required information, including that on this side below. Any forms not properly completed will be returned. RETURN ONLY THE ORIGINAL FORM, BUT KEEP A COPY FOR YOURSELF.

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ABSTRACT FORM

1978 American Osteopathic Association Research Conference

March 16-18, Chicago, Illinois


1. First Author Zvi Karni, Ph.D. Institution MSU/COM - Dept. of Biomechanics

2. Second Author Uri Dinnar, Ph.D. Institution MSU/COM - Dept. of Biomechanics

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4. Fourth Author John E. Upledger, D.O. Institution MSU/COM - Dept. of Biomechanics

5. Person who will present this paper, if oral presentation is desired: Z. Karni and/or U. Dinnar


6. Title: Mechanical and Material Descriptors for Sacroiliac Treatments

7. Abstract


The osteopathic treatment of sacroiliac dysfunctions involves the application of external forces and/or mechanical displacements by the physician. After the initial evaluation of sacroiliac mobility, the physician will gain further information by either applying forces manually at specific points over the sacrum, or by attempting to mobilize the sacral bone. By both approaches, the sacrum, which articulates between the ilia, because of the material properties of the anchoring ligaments and tissues, may be moved. The ligament and tissue attachments, in turn, exhibit different behaviors under the various conditions of induced stresses and displacements. They might exhibit an immediate elastic property, or an elasticity coupled with the damping effect of viscosity - namely a viscoelastic - type of behavior. Another possibility is a motion effected only when the stresses exceed a certain yielding point, which is the plastic property. Evidently, and even more frequently, combinations of these properties will be observed. The physician, who anticipates a certain responsive mechanical behavior to his input (palpatory procedure) uses the response of the output (material properties) as a feedback in a closed cycle control system and remodifies his procedure and eventually also the intensity of his induced input stimuli in the continuation of the treatment. Follow up of a few sacroiliac treatments shows how the material properties serve as descriptors and furnish a model by which the procedure of the treatment is guided, controlled and performed.



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CRANIAL SUTURE PAIN. J.E. Upledger & E.W. Retzlaff, Dept. of Biomechanics, College of Osteopathic Medicine, Michigan State University, E. Lansing, MI 48824, USA.

Recent study of the cranial intrasutural contents has revealed the presence of elastic and collagen fibers, of a vascular network, and of various neurostructures. The presence of these structures suggests mechanisms whereby pain can result from sutural dysfunction or injury. The neuroreceptors and neurovasorum seen are consistent with the concept of input into the autonomic nervous system which is heavily involved in pain mechanisms.

Innervation to collagen-elastic fiber complexes within the suture, further suggests a motor controlled contractile characteristic for these tissues. This finding supports the possibility of a cranial suture mobility. In the contracted state the collagen-elastic fiber complex would result in sutural compressions. This compression would in turn cause neurostimulation and intrasutural ischemia both due to increased intrasutural pressure.

Slides of human tissue will be shown which demonstrate these newly located intracranial structures as well as the absence of intrasutural calcification.

The clinical ramifications and various therapeutic applications will be discussed.

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5. Person who will present this paper, if oral presentation is desired:
John E. Upledger, D.O.

6. Title: The Relationship Between Craniosacral Examination Findings and the Problems of Special Education Students.

7. Abstract


A mixed sample of elementary school children were examined "blind" by the author. This sample contained: (1) children who were considered academically and behaviorally "normal" by school officials and educators; (2) learning disabled children; (3) emotionally impaired children; and (4) children with motor coordination impairments. The relationship between craniosacral dysfunctions uncovered by physical examination and these four classifications were studies by statistical analysis of data.

Historical data related to: (1) obstetrical complications; (2) head injuries; (3) seizure histories; and (4) history of ear problems were also collected. Statistical analysis for relationship between these data and craniosacral dysfunctions was also carried out.

The results of a search for craniosacral dysfunction pattern relationships and specific positive findings in the above categories will be presented.

In general, the results of this study support the presence of a positive relationship between the problems of special education (exceptional) students and craniosacral dysfunction. It does not mean that a cause-effect relationship necessarily underlies this coexistence. Both craniosacral dysfunction and the problems of special education students may be symptoms of another more primary etiology.



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6. Title: Mechanoelectrically Recorded Physiological Patterns Which Relate To Subjectively Reported Craniosacral Mechanism Phenomena.
7. Abstract


Previous work in this area of investigation was reported by the authors at the 1977 AOA Bureau of Research Conference. The purpose of the work is to record, objectively, changes in physiological parameters which either support or refute the subjective impressions of the physician, reported during the course of craniosacral osteopathic manipulative therapy.

The original investigation yielded results that suggested specific patterns of change in respiratory activity and of voltage potential of the legs of the patient which occur concurrently with subjective impressions of change in craniosacral mechanism function. The physician was reporting "blind" and the objectively measured changes usually preceded these subjective impressions by one or two seconds. These circumstances suggested that subjectively perceived craniosacral mechanism changes are accompanied by objectively measured and characteristic changes in physiological activity.

This second phase of the investigative work does confirm the coexistence of the above described impressions and phenomena.


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