

Radiographic Evidence of Cranial Bone Mobility

Sheryl Lynn Oleski, B.S.; Gerald H. Smith, D.D.S.; William T. Crow, D.O.

ABSTRACT: The purpose of this retrospective chart review was to determine if external manipulation of the cranium alters selected parameters of the cranial vault and base that can be visualized and measured on x-ray. Twelve adult patient charts were randomly selected to include patients who had received cranial vault manipulation treatment with a pre- and post-treatment x-ray taken with the head in a fixed positioning device. The degree of change in angle between various specified cranial landmarks as visualized on x-ray was measured. The mean angle of change measured at the atlas was 2.58 degrees, at the mastoid was 1.66 degrees, at the malar line was 1.25 degrees, at the sphenoid was 2.42 degrees, and at the temporal line was 1.75 degrees. 91.6% of patients exhibited differences in measurement at 3 or more sites. This study concludes that cranial bone mobility can be documented and measured on x-ray.

0896-9634/2002-034\$05.00/0, THE JOURNAL OF CRANIOMANDIBULAR PRACTICE, Copyright © 2002 by CHROMA, Inc.

Manuscript received May 23, 2001; revised manuscript received August 20, 2001; accepted September 5, 2001

Address for reprint requests: Sheryl Lynn Oleski Philadelphia College of Osteopathic Manipulative Medicine 4190 City Ave., Ste. 320 Philadelphia, PA 19131

Ms. Sheryl Lynn Oleski is a senior medical student at the Philadelphia College of Osteopathic Medicine. She is currently completing an undergraduate fellowship in Osteopathic Manipulative Medicine and is actively involved in research. Ms. Oleski plans to pursue a residency in Physical Medicine and Rehabilitation upon graduation.

Brant A. Larsen, D.C.

www.drlarsen.com

Osteopathic physicians have long believed that the bones of the cranium are mobile. Unfortunately, there have only been a few scientific papers to support this hypothesis, and the palpatory findings of cranial movement are considered to be subjective. This study was designed to determine whether this cranial bone mobility could be visualized and measured on A-P radiographs.

Kragt, et al.¹ showed that movement was possible at the sutures in a macerated human skull, and Retzlaff, et al.² documented that the cranial sutures do not fuse with age. Taking this information a step further, Zanakis, et al.³ attached infrared markers to the skin over selected skull bones, and used a 3-D kinematic system to analyze individual bone motion. Motion of the cranial bones was labeled complex, involving more than one axis of movement and not a simple hinge operation.

In 1970, Greenman⁴ published an article in which he described a method to diagnose cranial dysfunctions with an x-ray of the cranium. With a set of specified landmarks, and a vertical axis, torsions, and sprains could be viewed as deviations from the horizontal plane. It was also noted that a good clinical correlation existed between the x-ray findings and the palpators' diagnoses. The landmarks and practices Greenman used are those from which the protocol for this study was derived.

Demonstrating scientific evidence of cranial suture movement in living humans has many implications for