ACRRT Wavelengths

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CERVICAL INSTABILITY

By Steven J. Gould, D.C., D.A.C.B.R.

Evaluation of Spinal Instability.

This article will discuss the assessment of hypermobility and instability of spinal segments. Instability is generally defined as too much movement at a spinal motion unit. The motion unit is made up of two adjacent vertebrae and their intervertebral joints. The excessive motion is the result of loss of integrity of the spinal holding elements, be they ligamentous or bony structures. The term, instability, is generally defined as excessive motion that may place neurologic structures at risk of injury. Instability may be the result of congenital or developmental deficiencies in the spinal elements, traumatic disruption of the spinal structures, pathology of the bone, or degenerative changes of the joints allowing excessive joint movements (e.g. degenerative spondylolisthesis). Due to the heightened risk of neurologic damage, instability of a motion unit may be a contra-indication for spinal manipulation as a treatment modality. Determining if instability may be present is important for patient safety and to direct patients to other means of treatment for the instability, such as rehabilitation exercises or surgery.

Radiographic evaluation of spinal instability attempts to demonstrate excessive movement in the spine. For purpose of this article only the cervical spine will be discussed. The cervical spine is evaluated with flexion and extension lateral cervical images for demonstration of instability in the sagittal plane from Occ/C1 through C7/T1.

Upright (standing or seated), flexion and extension lateral cervical images are the accepted standard for evaluation of cervical instability. The measurements taken are the amount of anterior or posterior slippage (translation) of one vertebra on another and the change in disc angulation compared to adjacent levels. An anterior or posterior translation of more than 3.5 mm and/or a disc angle of 11 degrees greater than adjacent disc levels are indicative of instability. The usual method, with the patient performing the flexion and extension on their own is referred to as active range of motion. Penning, et al. also performed an assisted assessment in which the examiner actually placed their hands on the patient's head and assisted the patient into further flexion or extension (passive movement). There were also pilots (metal bars attached to the bucky) as stabilizing bars placed in front of and behind the patient's torso for stabilization of the upper thoracic spine, so that direct cervical motion could be measured. Penning's method is known as a passive flexion and extension study. The assisted "passive" flexion and extension method can demonstrate more levels of hypermobility and instability than an unassisted "active" flexion and extension study. Penning's study does not describe the amount of force applied to the patient's head and neck. However, the Penning's method should not be performed in the initial assessment on trauma patients, patients with inflammatory arthritis, or upper cervical anomalies such as Down's syndrome patients, because serious injury could occur if there is injury, damage, or abnormal formation of the upper cervical anatomy. Initial trauma assessments are only performed by having the patient move on their own and to the limits of their tolerance, without assistance from the technologist. Below are noted positioning and procedure diagrams for neutral lateral, flexion lateral, and extension lateral:

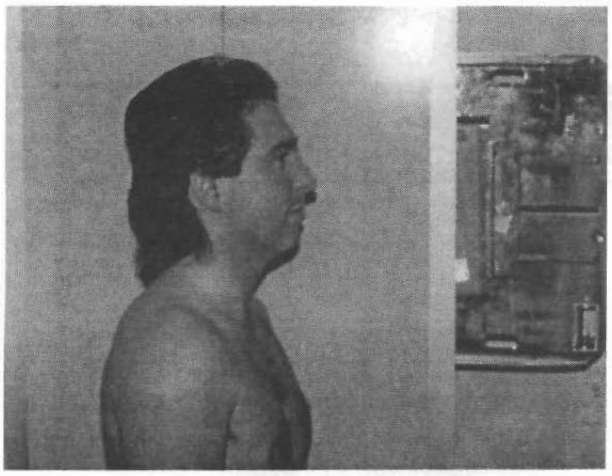

Figure 1 neutral lateral

Figure 2 flexion lateral

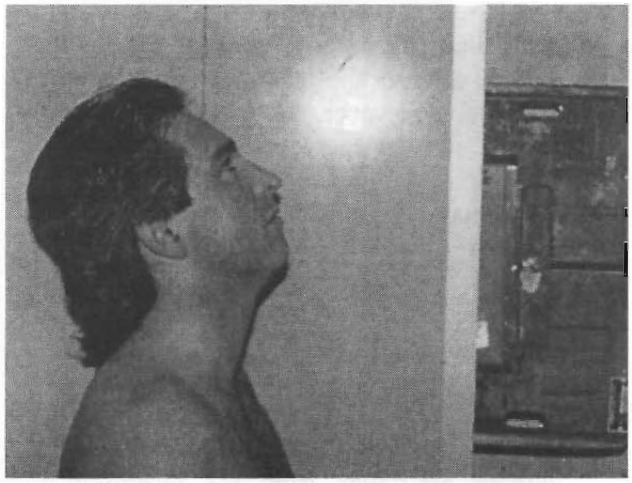

Figure 3 extension lateral

Flexion and extension lateral cervical projections:

Focal film distance 72"

Tube tilt; 0 degrees

Film size; 8 x 10 or 10 x 12

Measure at the lower cervical region through the trapezius muscle (same as neutral lateral cervical)

kVp: 70-80

mA: 200

Time; patient dependent and determined by measurement in centimeters across the base of the cervical spine.

Dvorak, Froehlich, Penning, Baumgartner, Panjabi, SPINE, Vol. 13, No. 7. 1988.

Introducing Dr. Steven J. Gould

The author of this article is one of our newest Board Members. Following chiropractic college, Dr. Gould was selected for a three-year residency in diagnostic imaging at Cleveland Chiropractic College. He passed the radiology board examinations on the first sitting and became a Diplomate of the American Chiropractic Board of Radiology (DACBR) in 1993. He is presently in full-time radiology practice and clinical/patient practice. He provides post-gradate lectures on varying topics of diagnostic imaging, including plain film radiology, MRI, and Ultrasound. He also provides instruction in radiographic positioning and procedures to Chiropractic Assistants, Chiropractic Radiographers, Nurses, and medical assistants. The Kansas Chiropractic Association named Dr. Gould Young Doctor of the Year in 1995. He is a member of the American Chiropractic College of Radiology, American Chiropractic Association and Council of Diagnostic Imaging.

RECERTIFICATION PROGRAMS

While prior approval of all programs is required, it is impossible for us to maintain all dates, places and faculty of all programs presentations. It is suggested that for information on programs available in your area that you contact the state chiropractic association, or the nearest chiropractic college.
Applications for programs approval are being received on nearly a daily basis. All dates of presentations are subject to change. A partial list is offered here for your perusal.

National University of Health Sciences
Limited Radiologic Technology
Begins Sept. 9-10
Telephone 630-889-6623
200 E. Roosevelt Rd.
Lombard, IL 60148

North Carolina Chiropractic Assoc.
919-832-0611
6 hour X-ray Certification Programs
Drs. Norbert Dombrowsky& Gene Lewis
Oct. 7
Dec. 9

X-ray Program
Dr. John Pammer
Sept.9-10
Sept. 23-24
PGH Springfield Suites
239 Summit Park Dr.
PGH, PA

Wisconsin Chiropractic Assoc.
Telephone 608-256-7023
CA Radiology
Sept 23-24
Sept 28
ACCRT Re Certification
Oct. 7-8
Oct. 21-22
Nov. 4-5

Northwester Health Sciences University
2501 West 84th St.
Bloomington, MN
Thurs. Oct, 5, 2006

Minn. Chiro. Assoc. Convention Sept 29-30

STUDY GUIDE AVAILABLE

Guides can be purchased for $50.00 (including shipping and handling) through the ACRRT office **(847) 705-1178**

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Annual dues billing is on its way – prepare your documentation for the 6 hours CE that is required to be sent along with your dues. SIR's are ready for those of you that did not attend a classroom program this year. The deadline for payment is December 31, 2006. A penalty will be assessed for payments received after that date. Other specifics are found on your web site – www.acrrt.com.

A good source for keeping current is the Journal of the American Society of Radiologic Technologist. Information to subscribe to the ASRT journal follows.

Radiologic Technology is the official peer-reviewed journal of the American Society of Radiologic Technologists. Published bimonthly (six issues per year), *Radiologic Technology* features peer-reviewed research, technical articles and columns focusing on various aspects of medical imaging. A one-year subscription is $60 for delivery to an address in the United States and $90 for delivery to a foreign address, including Canada. To subscribe or for additional information, contact the ASRT Customer Information Department at 800-444-2778 and press 5.

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